UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

FOR THE TRANSITION PERIOD FROM _____ TO _____

Commission File Number 001-36361

Aravive, Inc.

(Exact name of Registrant as specified in its Charter)

Delaware	**2834**	**26-4106690**
(State or Other Jurisdiction of Incorporation or Organization)	**(Primary Standard Industrial Classification Code Number)**	**(I.R.S. Employer Identification Number)**

River Oaks Tower
3730 Kirby Drive, Suite 1200
Houston, Texas 77098
(Address of principal executive offices)
(936) 355-1910
(Registrant's Telephone Number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, par value $0.0001 per share	**ARAV**	**Nasdaq Global Select Market**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☐ NO ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☒

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). YES ☒ NO ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definition of "large accelerated filer", "accelerated filer", "smaller reporting company", and "emerging growth company" in Rule 12b-2 of the Exchange Act:

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of the shares of common stock on The Nasdaq Global Select Market on June 28, 2019, the last business day of the registrant's most recently completed second fiscal quarter, was $45,315,713.

The number of shares of registrant's Common Stock outstanding as of March 16, 2020 was 15,015,932.

Documents incorporated by reference: None

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PART I

GENERAL

Unless otherwise indicated, all references to "Aravive," "we," "us," "our" or the "Company" in this Annual Report on Form 10-K refer to Aravive, Inc. (the combined company formerly known as Versartis, Inc.) and references to "Versartis, Inc." or "Private Aravive" refer to those respective companies prior to the completion of the Merger.

"Aravive®" and our other registered and common law trade names, trademarks and service marks are the property of Aravive, Inc. Other trade names, trademarks and service marks used in this Annual Report on Form 10-K are the property of their respective owners. Solely for convenience, the trademarks and trade names in this Annual Report on Form 10-K may be referred to without the ® and ™ symbols, but such references should not be construed as any indicator that their respective owners will not assert their rights thereto.

We may announce material business and financial information to our investors using our investor relations website at http://ir.aravive.com/investors/financial-information. We therefore encourage investors and others interested in Aravive to review the information that we make available on our website, in addition to following our filings with the Securities and Exchange Commission, or the SEC, webcasts, press releases and conference calls. Information contained on, or that can be accessed through, our website is not incorporated by reference into this Annual Report on Form 10-K, and you should not consider information on our website to be part of this Annual Report on Form 10-K.

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains "forward-looking statements" that involve risks and uncertainties. Our actual results could differ materially from those discussed in the forward-looking statements. The statements contained in this report that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the "Securities Act", and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Forward-looking statements are often identified by the use of words such as, but not limited to, "anticipate," "believe," "can," "continue," "could," "estimate," "expect," "intend," "may," "plan," "project," "seek," "should," "strategy," "target," "will," "would" and similar expressions or variations intended to identify forward-looking statements. These statements are based on the beliefs and assumptions of our management based on information currently available to management. Such forward-looking statements are subject to risks, uncertainties and other important factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified below and those discussed in the section titled "Risk Factors" included under Part I, Item 1A below. Furthermore, such forward-looking statements speak only as of the date of this report. Except as required by law, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date of such statements.

This Annual Report on Form 10-K also contains market data related to our business and industry. These market data include projections that are based on a number of assumptions. If these assumptions turn out to be incorrect, actual results may differ from the projections based on these assumptions. As a result, our markets may not grow at the rates projected by these data, or at all. The failure of these markets to grow at these projected rates may harm on our business, results of operations, financial condition and the market price of our common stock.

Item 1. Business.

Merger of Versartis, Inc. and Aravive Biologics, Inc.

On October 12, 2018, we, then known as Versartis, Inc. and Aravive Biologics, Inc. or Private Aravive, completed a merger and reorganization, or the Merger, pursuant to which Private Aravive survived as our wholly owned subsidiary. In connection with the completion of the Merger, on October 15, 2018, we changed our name from Versartis, Inc. to "Aravive, Inc." and on October 16, 2018, we effected a reverse split of our common stock at a ratio of 1-for-6, or the Reverse Split. On October 16, 2018, our common stock began trading on the Nasdaq Global Market under the symbol "ARAV." Unless otherwise stated, all share and per share amounts for all periods presented in this Annual Report on Form 10-K have been adjusted to reflect the Reverse Split.

Overview

We are a clinical-stage biopharmaceutical company developing treatments designed to halt the progression of life-threatening diseases, including cancer and fibrosis.

Our lead product candidate, AVB-500, is an ultrahigh-affinity, decoy protein that targets the GAS6-AXL signaling pathway by binding GAS6. By capturing serum GAS6, AVB-500 starves the AXL pathway of its signal, potentially halting the biological programming that promotes disease progression. AXL receptor signaling plays an important role in multiple types of malignancies by promoting metastasis, cancer cell survival, resistance to treatments, and immune suppression. The GAS6-AXL signaling pathway also plays a significant role in fibrogenesis.

Our current development program benefits from the availability of a proprietary serum-based biomarker that we expect will help accelerate drug development by allowing us to select a pharmacologically active dose.

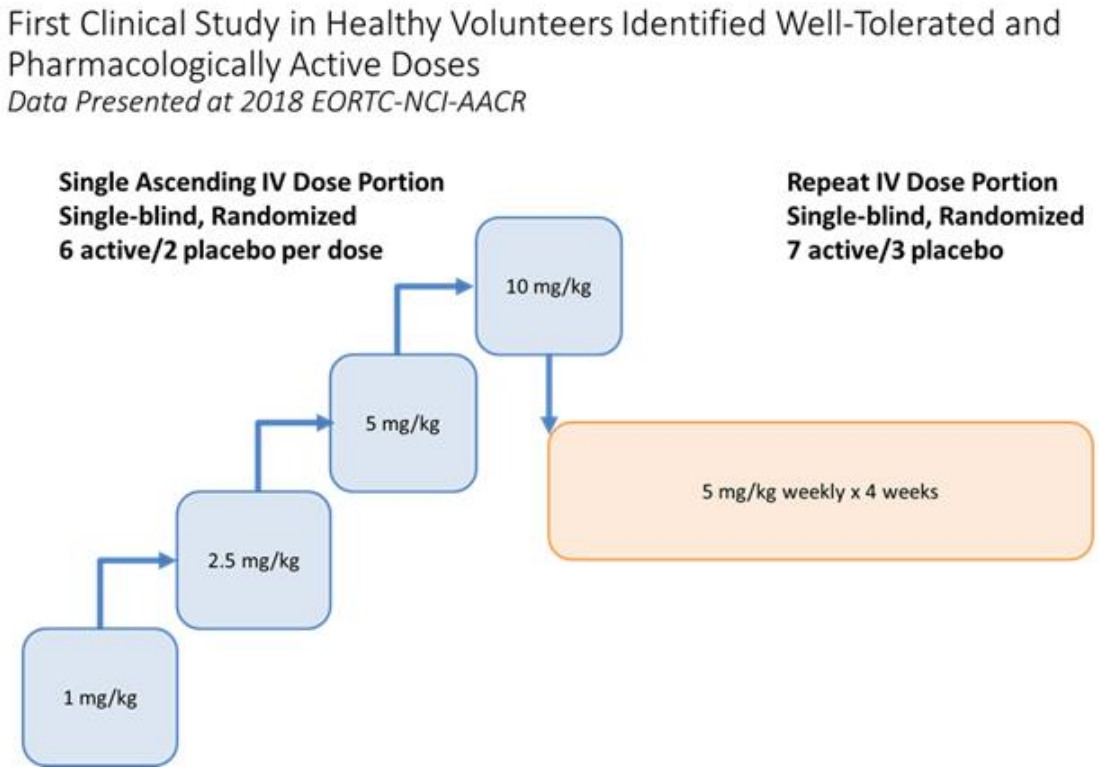
In our completed Phase 1 clinical trial with our clinical lead product candidate, AVB-500, we have demonstrated proof of mechanism for AVB-500 in neutralizing GAS6. Importantly, AVB-500 had a favorable safety profile preclinically and in the first in human trial in healthy volunteers. In December 2018, we initiated the Phase 1b portion of a Phase 1b/2 clinical trial of AVB-500 combined with standard of care therapies in patients with platinum-resistant ovarian cancer and are currently enrolling the expansion cohort in the Phase 1b. In August 2018, the FDA granted fast track designation to AVB-500 for platinum-resistant recurrent ovarian cancer. In January 2020, we announced that the FDA has cleared our Investigational New Drug (IND) application for investigation of AVB-500, in the treatment of our second oncology indication, clear cell renal cell carcinoma (ccRCC).

As we advance our clinical programs, we are in close contact with our CROs and clinical sites and are assessing the impact of COVID-19 on our studies and current timelines and costs. With the recent and rapidly evolving impact of COVID-19 on patient recruitment in clinical trials and considering patient safety and trial integrity, we have decided to amend our clear cell renal cell carcinoma (ccRCC) trial to initiate treatment at a higher dose given the safety profile seen with the 15 mg/kg dosing cohort of the platinum resistant ovarian cancer (PROC) trial and the initiation of the 20 mg/kg dosing cohort. While this may delay first patient dosing, the overall timelines may not be significantly impacted given the higher starting dose, assuming the COVID-19 situation does not interfere with ongoing clinical studies. We will pause new enrollment in its IgA nephropathy (IgAN) trial until the risk of unnecessary exposure of patients to COVID-19 is decreased.

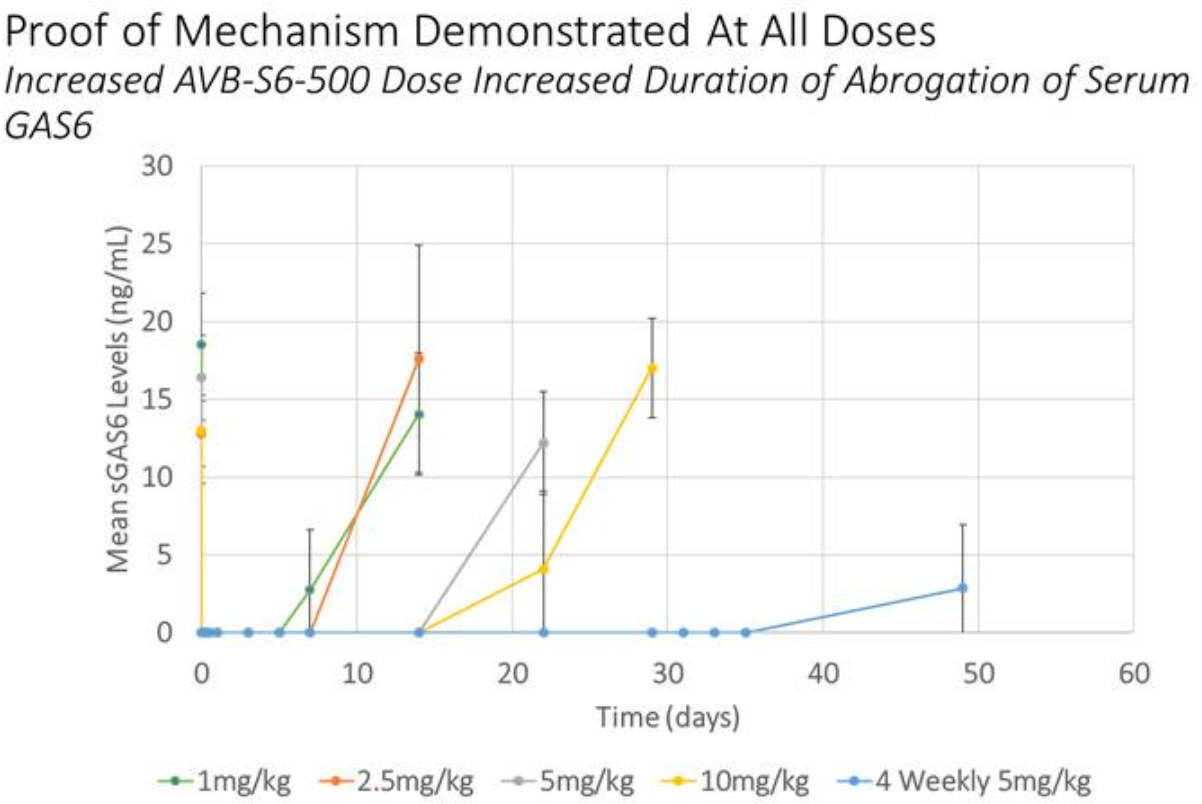
In 2016, Private Aravive was approved for a $20 million Product Development Award from the Cancer Prevention & Research Institute of Texas, or CPRIT, which is one of the largest single grants that CPRIT has awarded to date based on information published on CPRIT's website. All our revenue for the years ended December 31, 2019 and 2018 was grant revenue received from CPRIT.

Phase 1 Clinical Trial

In 2018, we completed our Phase 1 clinical trial with our lead protein, AVB-500, in 42 dosed normal healthy volunteers. Subjects in the Phase 1 trial were given single ascending intravenous, or IV, doses and 4 weekly repeat IV doses of AVB-500. The primary objective of the trial was to evaluate the safety and tolerability in healthy subjects of intravenously administered AVB-500. Secondary objectives were to characterize the pharmacokinetics and pharmacodynamics of intravenously administered AVB-500 over a range of dose levels and at a single dose level (5mg/kg) for a total of 4 weekly doses.



There were no adverse events, or AEs, classified as serious and no dose-related AEs. Treatment-emergent AEs were generally mild, transient, and self-limiting. No anti-drug antibodies were noted. As anticipated from preclinical studies, a maximum tolerated dose was not reached and AVB-500 was well-tolerated across all doses (1-10mg/kg single doses and 4 weekly 5mg/kg doses). The clinical trial met the safety and tolerability endpoints for the trial and demonstrated clinical proof-of-mechanism for AVB-500 at all doses in neutralizing GAS6, as all doses tested in human subjects suppressed serum GAS6 for at least one week. Serum GAS6 levels were suppressed until 22 and 29 days following the 5 mg/kg and 10 mg/kg doses, respectively. Weekly administration of 5mg/kg resulted in suppression of sGAS6 in 4 out of 6 subjects for at least 3 weeks after the fourth dose.



Note: AVB-500 is AVB-S6-500

By conducting the Phase 1 trial in healthy volunteers, we expect that we will not need to conduct any additional Phase 1 studies for other indications in which AVB-500 is the product candidate, and instead expect to have the ability to have as our first clinical trial for such other indications a Phase 1b or Phase 2 trial, pending FDA review.

First Oncology Indication - Ovarian Cancer and Current Market Opportunity

Ovarian cancer ranks fifth in cancer deaths among women, accounting for more deaths than any other cancer of the female reproductive system. According to the American Cancer Society, it is estimated that in 2020 there will be approximately 21,750 new cases of ovarian cancer diagnosed in the United States and approximately 13,940 ovarian cancer deaths in the United States. A woman's risk of getting ovarian cancer during her lifetime is about 1 in 78. Her lifetime chance of dying from ovarian cancer is about 1 in 108. Ovarian cancer accounts for just 2.5% of all female cancer cases, but 5% of cancer deaths because of the disease's low survival rate. Due to the nonspecific nature of disease symptoms, currently the majority of ovarian cancer patients are diagnosed with advanced-stage disease, at which point their prognosis is poor. Improving the ability to detect ovarian cancer early is a research priority, given that women diagnosed with localized-stage disease have more than a 90% five-year survival rate.

Current standard of care treatments for ovarian cancer include surgery and chemotherapy (cisplatin and carboplatin). The median progression free survival rate for patients given standard of care (paclitaxel or doxil/pegylated liposomal doxirubicin) to treat platinum-resistant recurrent ovarian cancer is 3-4 months with a median overall survival of 9-12 months. Targeted therapies include bevacizumab (Avastin), and other drugs, such as immune checkpoint inhibitors, are being investigated as well. Drugs that inhibit the enzyme PARP-1 (called PARP inhibitors) have been approved for patients with ovarian cancer caused by mutations in BRCA1 and BRCA2 or as maintenance treatment following a platinum-based chemotherapy. New evidence shows that ovarian cancers can also become resistant to treatment with PARP inhibitors, and research is being conducted in the field to find ways to counteract this process.

Decision Resources Group in its July 2018 Ovarian Cancer Disease Landscape and Forecast estimates the ovarian cancer market to grow at an annual compound rate of 14% during the 2017-2027 period from approximately $1.4 billion to $5.3 billion in the seven major markets, which comprise the United States, France, Germany, Italy, Spain, the United Kingdom and Japan.

Overview of Our Phase 1b portion of the Phase 1b/2 Clinical Trial

In December 2018, we began treating patients in the Phase 1b portion of our Phase 1b/2 clinical trial combining AVB-500 with standard-of-care therapies (specifically, paclitaxel ("Pac"), and pegylated liposomal doxorubicin ("PLD")) in patients with platinum- resistant recurrent ovarian cancer. The decision to select platinum-resistant recurrent ovarian cancer as our first indication was based upon the preclinical data that we had generated with AVB-500 in platinum resistant ovarian cancer, the fact that platinum resistant ovarian tumors are highly AXL positive and the high unmet medical need for effective therapies to treat platinum resistant ovarian cancer. In August 2018, the FDA granted fast track designation to AVB-500 for platinum-resistant recurrent ovarian cancer.

The Phase 1b portion of the Phase 1b/2 clinical trial is designed, in part, to confirm the dosing regimen predicated on the Phase 1 trial in healthy volunteers and to identify the dose to investigate in the Phase 2 portion of the trial. The primary objective of the Phase 1b portion of the Phase 1b/2 clinical trial is to assess the safety and tolerability of AVB-500 in combination with Pac and PLD, and secondary objectives are to assess PK/PD (serum GAS6 levels), efficacy, and potential immunogenicity of AVB-500. Exploratory objectives include efficacy endpoints in biomarker (GAS6, AXL) defined populations based on expression of those biomarkers in serum and/or tumor tissue.

In July 2019, we announced the results of an independent safety monitoring committee review of data from the initial 12 patients of the ongoing Phase 1b portion of our Phase 1b/2 trial of AVB-500 in platinum-resistant recurrent ovarian cancer patients. The committee unanimously agreed that AVB-500 was well-tolerated and serum GAS6 levels were suppressed throughout the 2-week dosing interval in each of the two cohorts, and recommended the trial continue as planned and enroll additional patients into each cohort to collect additional preliminary efficacy, safety, biomarker and PK/PD data at the current dose of 10mg/kg.

Data from the Initial Twelve Patients of the Ongoing Phase 1b Presented in September 2019

In September 2019, we presented positive data from the initial 12 patients of the ongoing Phase 1b portion of the trial in a late breaking oral presentation at the European Society for Medical Oncology (ESMO) Congress in Barcelona. The Overall Response Rate (ORR) in patients given AVB-500 and either of the two chemotherapies (PAC or PLD) was found to be higher than the typical rate for PAC or PLD alone and AVB-500 was well-tolerated. We also reported a finding of exposure-response relationship from the analysis of preliminary data from initial 28 patients (including the initial 12 patients) in September 2019. The analysis suggested that higher AVB-500 blood levels were likely to result in higher clinical benefit rate in patients and higher peak and trough levels in patients after first dose of AVB-500 appeared to predict anti-tumor activity. The finding guided us to study higher doses of the drug and the Company expanded the Phase 1b program to study 15 mg/kg and 20 mg/kg dose levels.

Data from the Initial 31 Patients of the ongoing Phase 1b Presented in November 2019

In November 2019, we reported positive data from the initial 31 patients of the ongoing Phase 1b portion of the trial. The data from the first 31 patients treated at the 10mg/kg dose affirm earlier findings on the relationship between AVB-500 levels and anti-tumor response. In this data analysis, serum drug levels of AVB-500 > 13.8 mg/L at Cycle 1 Day 15 (defined as the minimal efficacious concentration or MEC) were found to be strongly predictive of anti-tumor activity with statistically significant correlation to progression-free survival (PFS; p=0.0066). PFS is the primary endpoint for platinum-resistant ovarian cancer clinical trials.

At the 10 mg/kg dose, patients that met or exceeded the minimal efficacious concentration (MEC) of AVB-500 (17 out of 31 patients) demonstrated a greater than four-fold increase in median PFS over those with low exposure (8.1 vs. 1.8 months; p=0.0016) and approximately two-fold improvement in ORR (29% vs. 14%), including one complete response (CR). Patients who achieved the MEC of AVB-500 in their blood also showed improvements in duration of response (from 7.6 to 3.9 months) and clinical benefit rate (CBR defined as ORR + SD) (82% vs. 43%), with reduced chance of progressing by 3.2-fold (from 57% to 18%).

The baseline characteristics, demographics, and safety parameters were comparable between patients who achieved the minimal efficacious concentration and those who fell below that threshold. The analysis shows that the clinical benefit at this dose level in the trial can be primarily attributed to AVB-500 exposure.

The analysis of the best overall response by investigator determined RECIST v1.1 criteria data are summarized in the table below:

	Above Minimal Efficacious Exposure*	Below Minimal Efficacious Exposure*
Number of Patients (n)**	17	14
Complete Response (CR)	1 (6%)	0
Partial Response (PR)	4 (24%)	2 (14%)
Overall Response Rate (ORR)	5 (29%)	2 (14%)
Stable Disease (SD)	9 (53%)	4 (28%)
Clinical Benefit (SD+ORR)	14 (82%)	6 (43%)
Median DOR (months)	7.62	3.96
Median PFS (months)	8.1	1.8
Progressive Disease (PD)	3 (18%)	8 (57%)
Patients remaining on study as of Oct 31 2019	8 (47%)	0

* Above vs. Below MEC of 13.8mg/L at the first trough measurement (Cycle 1 Day 15), respectively

** Cautionary note - the data analyses were conducted on a small patient population (n=31)

Other notable findings:

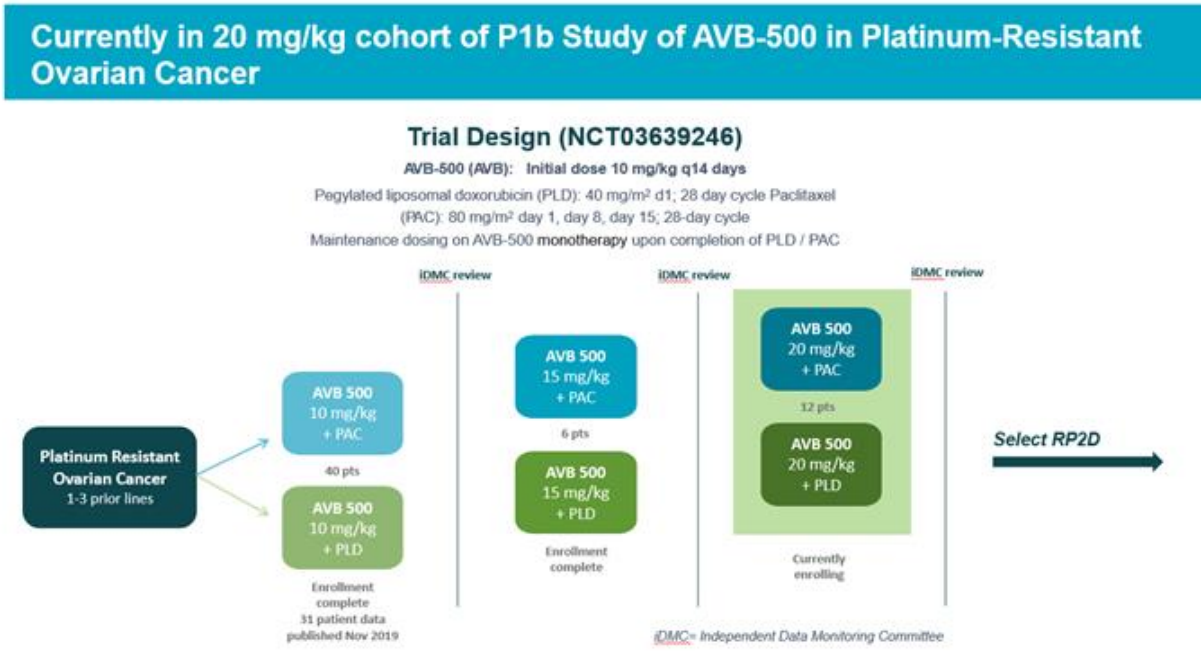
- The patient with CR achieved the MEC of AVB-500 and was on paclitaxel. She had a baseline serum GAS6 level that was typical of the platinum-resistant ovarian cancer population and 2-fold higher than that observed in healthy volunteers. She also exhibited poor prognostic factors, including two prior lines of therapy and platinum-free interval of less than 3 months.
- Among the patients who responded to AVB-500, four of seven remained responders and on study, and two patients were on AVB-500 alone for approximately 5 months as of the end of October 2019.
- Among the 13 patients whose best response was SD, four achieved the MEC of AVB-500 and were still on study at the end of October 2019. One SD patient, whose trough level was below the minimal efficacious concentration, did not progress but withdrew consent. Because the trial is still ongoing and includes only patients above the MEC, duration of response and PFS may continue to evolve.
- Safety data from the initial 31 patients:
  - AVB-500 (10mg/kg) was well-tolerated
  - No serious and unexpected adverse reactions
  - No dose limiting toxicities
  - Infusion reactions managed by premedication regimen

Enrollment of Patients at Higher Doses

The data from the initial 31 patients of the ongoing Phase 1b portion of the trial confirm our strategy to investigate higher doses in the current Phase 1b portion of the Phase 1b/2 clinical trial to determine if a greater proportion of patients can exceed the MEC. According to our modeling, a dose of 20 mg/kg should allow greater than 90% of the patients to achieve the MEC. We have treated 6 patients with 15mg/kg and anticipate treating an additional 12 patients with 20mg/kg. The safety and efficacy profile seen in the small number of patients in the 15 mg/kg dose cohort is consistent with the hypothesis generated from the 10 mg/kg dose cohort.

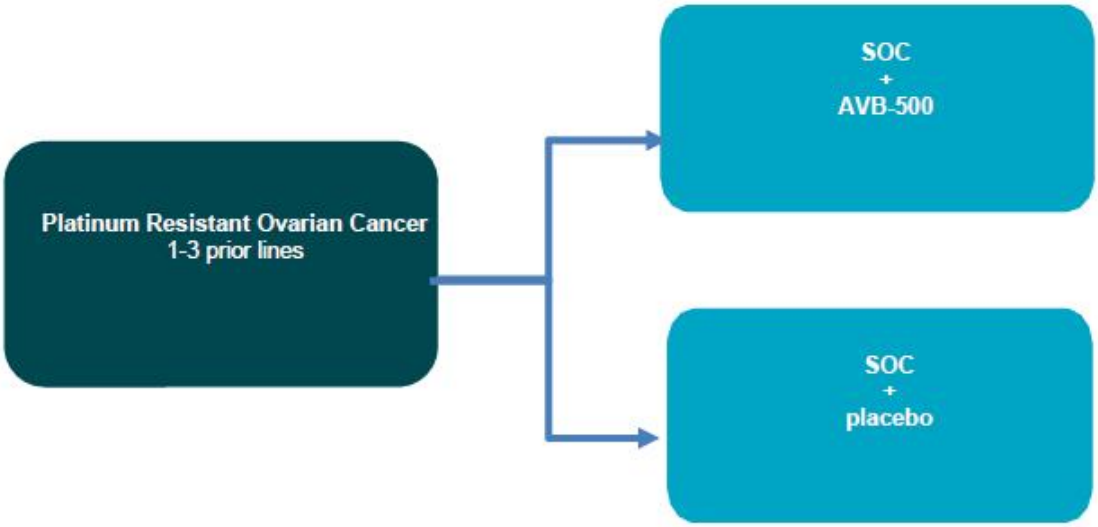
In February 2020, we announced that an independent data monitoring committee reviewed the open-label data following the first 28-day treatment cycle for the three patients in each of the two 15 mg/kg dosing cohorts of the Phase 1b portion of the Phase 1b/2 clinical trial and unanimously recommended the trial continue as planned with enrollment of patients into the 20mg/kg dose cohorts. The DMC did not identify any safety concerns with AVB-500. We anticipate treating an additional 12 patients with 20mg/kg. With the expansion, the Phase 1b portion of the trial is expected to enroll 58-64 patients.

We anticipate reporting safety and PK data from the Phase 1b portion of the Phase 1b/2 clinical trial in mid-2020.



Planned Phase 2/3 Clinical Trial Following Completion of Phase 1b Dose Escalation

With the expansion of the Phase 1b portion of the trial, the Phase 2 portion of the Phase 1b/2 clinical trial is expected to enroll the first patient in the second half of 2020 and will be a double-blind, randomized, controlled trial comparing AVB-500 plus standard of care (PLD or Pac) to standard of care alone (PLD or Pac + placebo). This Phase 2 portion is expected to enroll approximately 120 patients who will be randomized on a 2:1 basis to experimental arm versus control arm. The primary objective of the Phase 2 portion of the Phase 1b/2 clinical trial is to assess anti-tumor activity of AVB-500 in combination with Pac or PLD as a measure by progression free survival (PFS). Secondary objectives include assessment of PK/PD and additional efficacy endpoints (objective response rate (ORR), overall survival (OS), duration of response (DOR), clinical benefit rate (CBR)). Depending on the results of the expanded Phase 1b trial, we may seek advice from FDA regarding the potential to make the randomized, controlled, blinded portion of the trial registration enabling.



Second Oncology Indication-Clear Cell Renal Cell Carcinoma (ccRCC)

Clear Cell Renal Cell Carcinoma and Current Market Opportunity

Kidney cancer is a leading cause of cancer-related deaths in the United States and is among the 10 most common cancers in both men and women. Metastasis to distant organs including the lung, bone, liver and brain is the primary cause of death in kidney cancer patients as only 12% of metastatic kidney cancer will survive past 5 years. According to the American Cancer Society, it is estimated that there will be approximately 73,750 new cases of kidney cancer and 14,830 people will die from this disease in the United States during 2020.

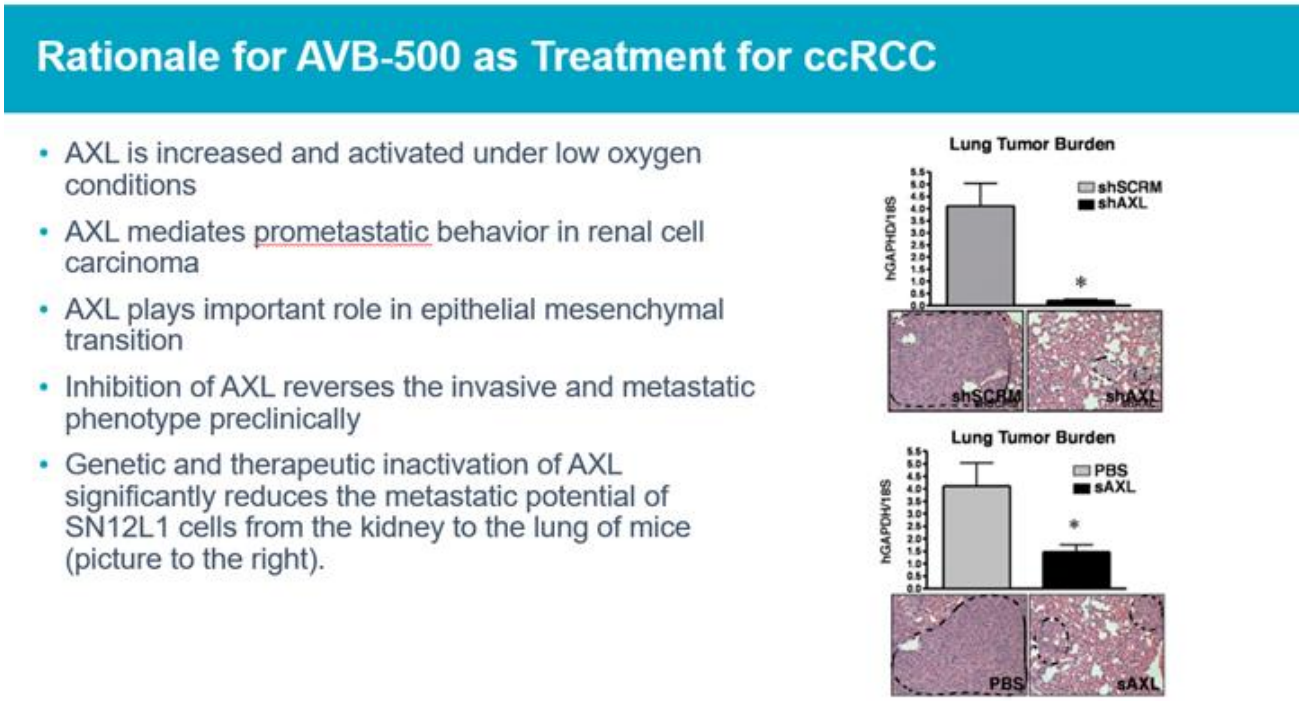
Clear cell renal cell carcinoma (ccRCC) is a cancer of the kidney. The name "clear cell" refers to the appearance of the cancer cells when viewed with a microscope. Clear cell renal cell carcinoma occurs when cells in the kidney quickly increase in number, creating a lump (mass). Though the exact cause of clear cell renal cell carcinoma is unknown, smoking, excessive use of certain medications, and genetic predisposition conditions, e.g. von Hippel Lindau syndrome which involves genetic mutation in VHL, a tumor suppressor gene controlling tumor initiation in ~90% of ccRCC tumors, may contribute to the development of this type of cancer.

Treatment often begins with surgery to remove as much of the cancer as possible, and may be followed by radiation therapy, chemotherapy, biological therapy, or targeted therapy. Most kidney cancer is chemotherapy and radiation resistant, resulting in a large unmet need for treatment therapies.

Planned Phase 1b/ 2 Clinical Trial

In February 2019, we announced our plans to develop AVB-500 in our second oncology indication, ccRCC. The decision to select ccRCC as our second indication was based upon the strong preclinical data that we had generated with AVB-500 and the fact that AXL expression in primary tumors of ccRCC patients has been shown, in, third party studies as well as our own studies (Rankin et al, Direct regulation of GAS6/AXL signaling by HIF promotes renal metastasis through SRC and MET, PNAS September 16, 2014 vol. 111 no. 37 13373–13378), to correlate with aggressive tumor behaviors.

On January 13, 2020, we announced that we had received FDA clearance of our IND for investigation of our lead candidate, AVB-500, in the treatment of ccRCC. The trial has a Phase 1b safety portion and a Phase 2 randomized, controlled portion. The Phase 1b portion will investigate the safety and tolerability of escalating doses of AVB-500 in combination with cabozantanib (with the ability to increase/ decrease dose based on tolerability) in up to 18 patients with advanced clear cell renal cell carcinoma that have progressed on or after or were intolerant to front-line treatment. The primary endpoints for the Phase 1b portion of the clinical trial are safety, pharmacokinetic and pharmacodynamic measurements with secondary endpoints including preliminary activity measures. The Phase 2 portion of the clinical trial will investigate the recommended Phase 2 AVB-500 dose identified during the Phase 1b portion in combination with cabozantinib versus cabozantinib alone in 90 patients with advanced ccRCC that have progressed on or after or were intolerant to front-line treatment. The Phase 2 portion will be controlled and randomized with a primary endpoint of progression free survival (PFS) and secondary endpoints of overall response rate (ORR), duration of response (DOR), clinical benefit rate (CBR) and overall survival (OS). The clinical trial will also explore AVB-500 effects on biomarkers (GAS6) in serum. With the recent and rapidly evolving impact of COVID-19 on patient recruitment in clinical trials and considering patient safety and trial integrity, we have decided to skip the 10mg/kg dose initially planned. Given the safety profile seen with the 15 mg/kg dosing cohort of the platinum-resistant ovarian cancer trial and the initiation of the 20 mg/kg dosing cohort in the PROC trial, we intend to amend the ccRCC trial to initiate dosing patients at a higher dose after iDMC review of the 20 mg/kg cohort in the PROC trial. While this may delay first patient dosing, the overall timelines may not be significantly impacted given the higher starting dose and assuming the COVID-19 situation does not interfere with patient recruitment and retention.



Non-Oncology Indication-IgA Nephropathy

IgA Nephropathy and Current Market Opportunity

IgA Nephropathy (IgAN) is a nonsystemic renal disease that is characterized by predominant IgA deposition in the glomerular mesangium, causing mesangial cell proliferation and fibrosis. IgAN is the most common cause of primary glomerulonephritis and responsible for 10% of patients on dialysis affecting approximately 150,000-180,000 people in the United States. Up to 50% of patients with IgAN develop end-stage renal disease and require dialysis within 20 years of diagnosis. There is a high unmet medical need for treatment for IgAN as there are currently no therapies approved for treatment of IgAN.

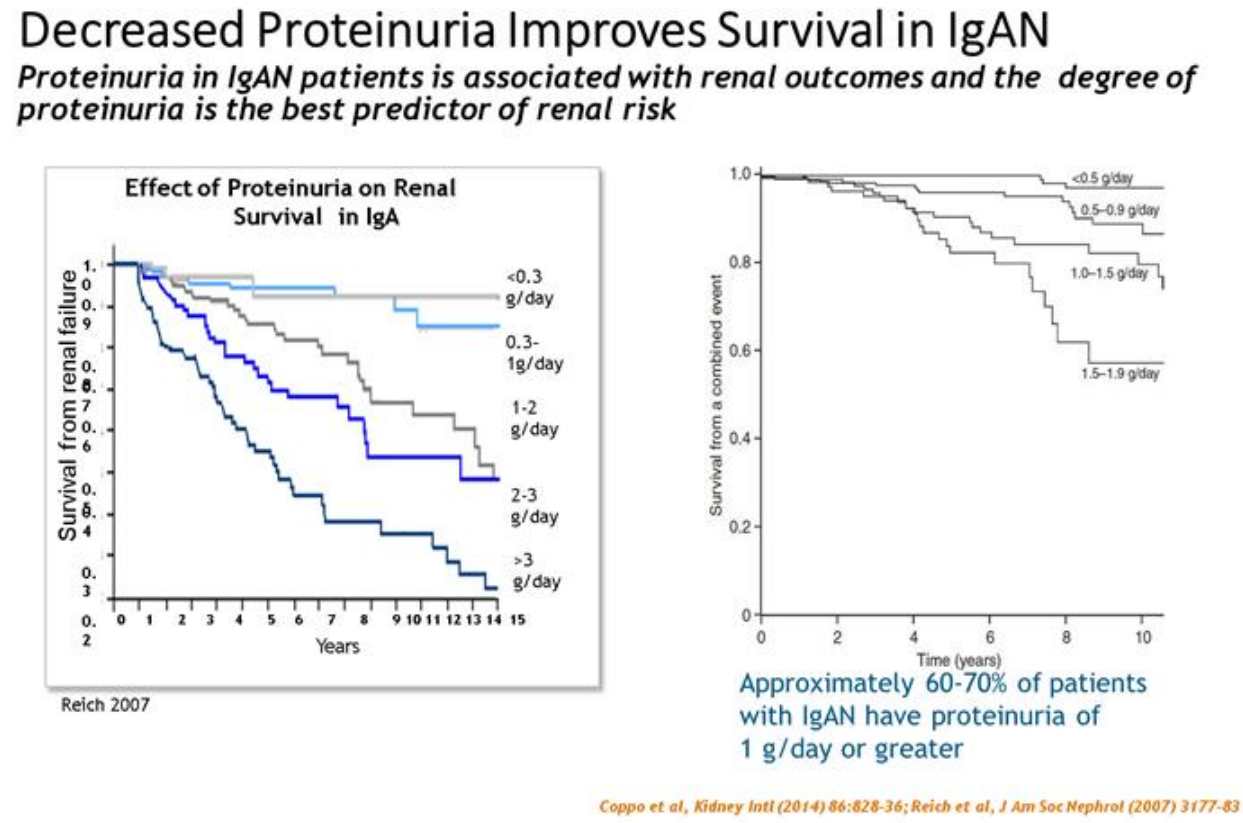
Phase 2a Proof of Concept Trial in IgAN Patients

In February 2019, we announced our intent to develop AVB-500 for potential use in patients with IgAN. On December 20, 2019, we announced initiation of the Phase 2a kidney fibrosis trial. The clinical trial with AVB-500 in patients with IgAN is a small open label clinical trial of 12-24 patients with IgAN treated for a 3-month period with 6 doses of AVB-500, with our ability to increase doses based upon data. We anticipate that the clinical trial will be performed at clinical sites in both the United States and the Ukraine. The primary objectives of the clinical trial will be to evaluate the safety and tolerability of AVB-500 in patients with IgAN and to

assess the efficacy of AVB-500 in patients with IgAN at a dose that has the desired pharmacokinetic/pharmacodynamic profile. Secondary objectives will be to evaluate and compare changes in pharmacokinetic, pharmacodynamic, anti-drug antibodies and neutralizing antibody responses. The clinical trial will monitor proteinuria, hematuria and other renal functions. With the recent and rapidly evolving impact of COVID-19 on patient recruitment in clinical trials and considering patient safety and trial integrity, we will pause new enrollment in the IgA nephropathy (IgAN) trial until the risk of unnecessary exposure of patients to COVID-19 is reduced.

Role of GAS6 In IgAN

GAS6 is a growth factor that causes proliferation of mesangial cells in the development of glomerulonephritis. GAS6 is upregulated in either endothelial/mesangial cells or podocytes in IgAN (Nagai K, Miyoshi M, Kake T, Fukushima N, Matsuura M, et al. (2013) Dual Involvement of Growth Arrest-Specific Gene 6 in the Early Phase of Human IgA Nephropathy. PLoS ONE 8(6): e66759. doi:10.1371/journal.pone.0066759). and expression in the diseased kidney tissue correlates with severity of IgA nephropathy (Nagai K, Miyoshi M, Kake T, Fukushima N, Matsuura M, et al. (2013) Dual Involvement of Growth Arrest-Specific Gene 6 in the Early Phase of Human IgANephropathy. PLoS ONE 8(6): e66759. doi:10.1371/journal.pone.0066759). Preclinical data demonstrated that a lower affinity GAS6-trap improves fibrosis and proteinurea in experimental glomerulonephritis (Am J Pathol. 2001 Apr; 158(4): 1423–1432.doi: 10.1016/S0002-9440(10)64093-X). Aravive has assessed serum levels in a small number of IgAN patients and found that they are elevated in comparison to age-matched subjects who do not have IgAN.



GAS6 is expressed in IgAN

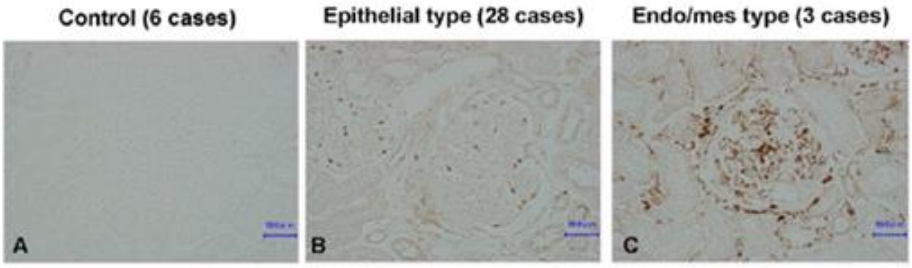


Figure 1. Gas6 expression in human IgA nephropathy. Biopsy samples were immunostained using indirect immunohistochemistry procedure with anti-Gas6 antibody. Representative images are shown in (A) from control patients, (B) from IgA nephropathy cases immunostained in epithelial cells, and (C) from IgA nephropathy cases immunostained in endothelial and mesangial cells. The original magnification was X200. Endo/mes, Endothelial and mesangial.
doi:10.1371/journal.pone.0066759.g001

GAS6 Expression Correlates with Severity of IgA Nephropathy

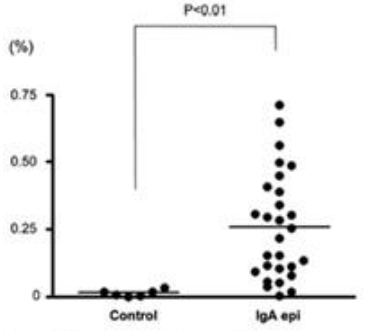
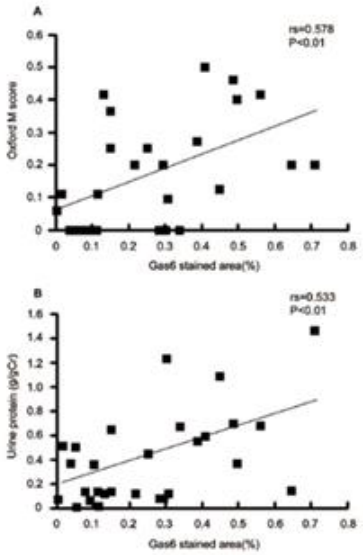
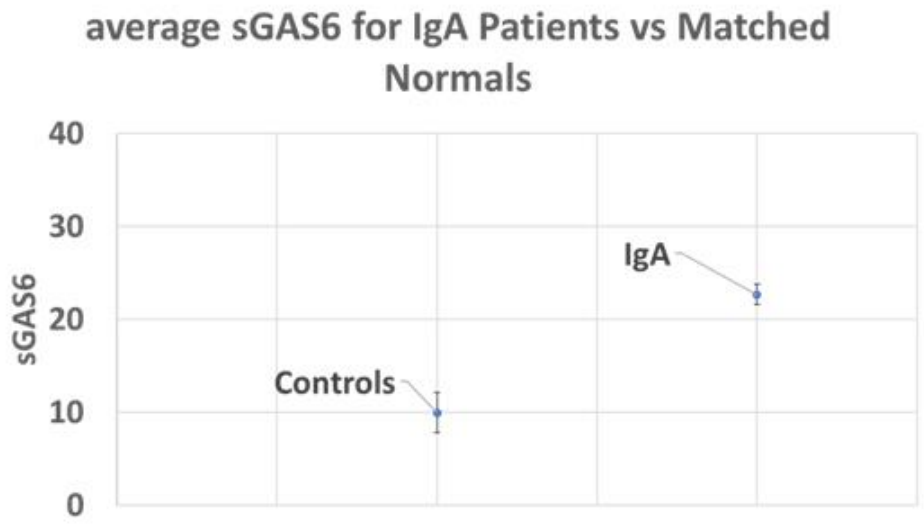


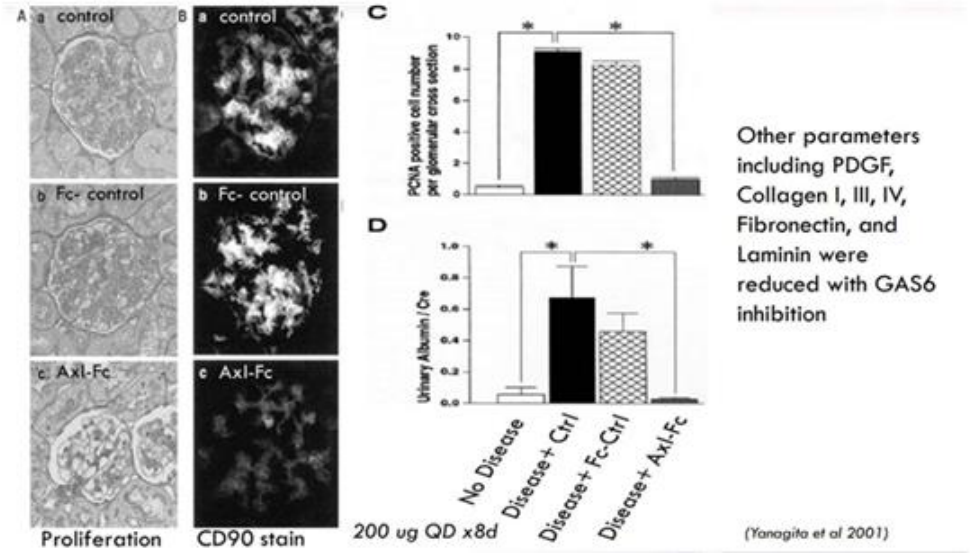
Figure 2. Gas6 stained area in human IgA nephropathy. Gas6 stained area is expressed as a percentage of total glomerular area occupied by Gas6 immunostained area. For each sample, at least eight glomerular profiles per patient were measured. IgA epi, IgA epithelial type.
doi:10.1371/journal.pone.0066759.g002



Aravive Data: Serum GAS6 Elevated in IgA Patients



Lower Affinity GAS6-trap Improves Fibrosis and Proteinurea in Preclinical Experimental Glomerulonephritis



Investigator Sponsored Trials

In May 2019 we entered into an institution sponsored clinical trial agreement with M.D. Anderson Cancer Center for the use of, and our supply of, AVB-500, in combination with AstraZeneca Pharmaceuticals LP's medicinal product durvalumab in a Phase 1/2 trial being conducted by the M.D. Anderson Cancer Center for the treatment of patients with platinum-resistant, recurrent epithelial ovarian cancer.

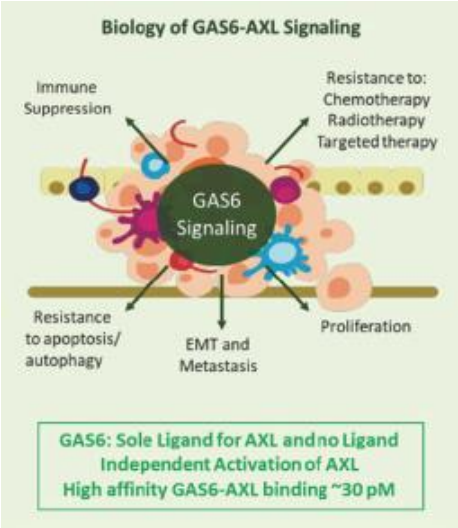
In March 2020, we announced that the first patient was dosed in a Phase 1/2 trial for the use of, and our supply of, AVB-500, in combination with EMD Serono's medicinal product avelumab being conducted by the University of Oklahoma for the treatment of patients with advanced urothelial cancer (COAXIN trial).

Other Indications

We expect, subject to sufficient funding, to initiate additional clinical trials. Such additional clinical trials may involve combining AVB-500 with standard of care in a number of tumor types in addition to ovarian cancer and ccRCC, triple negative breast cancer, acute myeloid leukemia, and pancreatic cancer. We are also considering conducting studies in non-oncology indications such as lung or liver fibrosis in addition to the clinical trial with patients with IgAN.

GAS6-AXL Pathway

As illustrated in the following graphic, AXL receptor signaling plays an important role in multiple types of malignancies by promoting metastasis, cancer cell survival, resistance to treatments, and immune suppression.



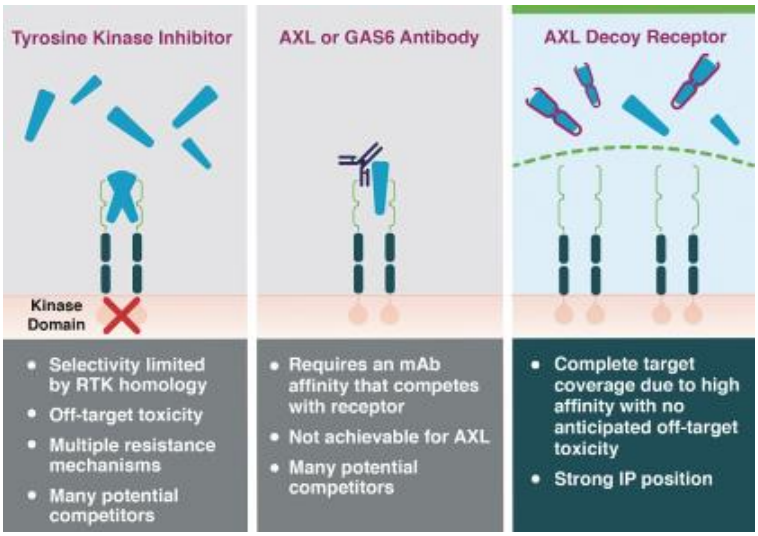
In preclinical studies, we have also identified high AXL expression on tumors resistant to the combination of radiotherapy and immunotherapy and that genetically inactivating AXL in tumors resistant to immunotherapy and radiotherapy restored anti-tumor immune response.

In preclinical studies conducted in Dr. Giaccia's laboratories at Stanford University, Dr. Giaccia was able to demonstrate that the immune response generated by loss of AXL leads to adaptive immune resistance through PD-L1 expression and Treg (regulatory T cells) infiltration. This resulted in tumors that became sensitive to checkpoint immunotherapy when they were previously resistant. Thus, GAS6-AXL pathway inhibitors, in combination with radiation or chemotherapy and immunotherapy, may be a promising treatment regimen and may restore anti-tumor immune response.

Aravive-S6 (AVB-S6)

AVB-S6 is comprised of a family of novel, high-affinity, soluble Fc-fusion proteins designed to block the activation of the GAS6-AXL signaling pathway by intercepting GAS6 and interfering with its binding to its receptor AXL. AVB-S6 proteins have been engineered to have approximately 50 to 200 times greater affinity for human GAS6 compared to the native AXL receptor, effectively sequestering GAS6 and abrogating AXL signaling. We believe this 'decoy receptor' approach is well suited for AXL inhibition compared to small molecule receptor tyrosine kinase inhibitors or antibodies, as illustrated by the following graphic.

Approaches to Inhibiting the GAS6/AXL Signaling Pathway



RTK - receptor tyrosine kinase

mAb - monoclonal antibody

Preclinical Results

Our AVB-S6 proteins have been shown to bind GAS6 with higher affinity than the endogenous AXL protein and inhibit GAS6/AXL signaling. Initial preclinical pharmacology studies were conducted with a variety of engineered AVB-S6 proteins. The preclinical program demonstrated that high GAS6 binding affinity was critical and correlative with the ability of AVB-S6 to inhibit metastasis and disease progression *in vivo*. AVB-S6 proteins have demonstrated significant efficacy in mouse models of metastatic ovarian, breast, renal, and pancreatic cancers.

AVB-S6 proteins are selective for the AXL signaling pathway and demonstrate potent anti-metastatic activity in preclinical models. The following graphic indicates that AVB-S6 is selective for the AXL signaling pathway and is potent in a preclinical breast cancer lung metastasis model. The left panel shows western blot analysis of OVCAR8 (human platinum-resistant ovarian cancer) cells after 4-hour treatment with BGB324, foretinib, or AVB-S6. The right panel shows representative bioluminescent images of lung metastases in the 4T1 mouse model following treatment with vehicle (negative control), foretinib, BGB324 or AVB-S6.

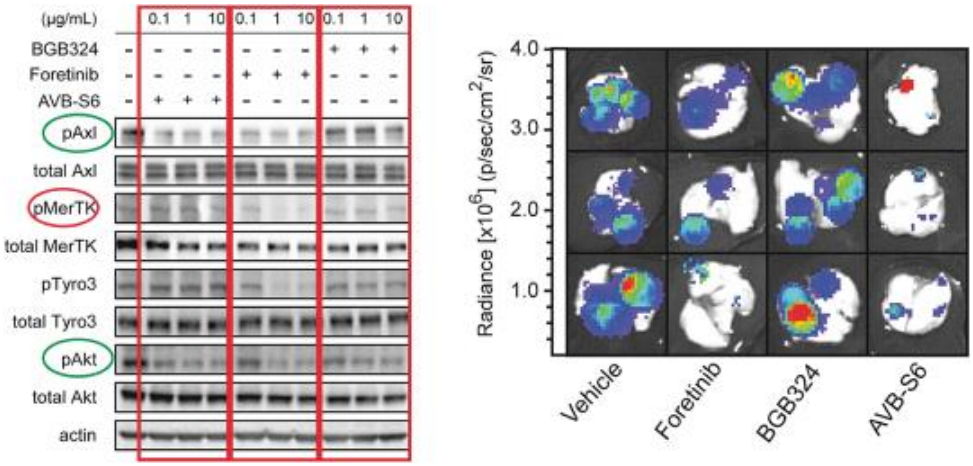
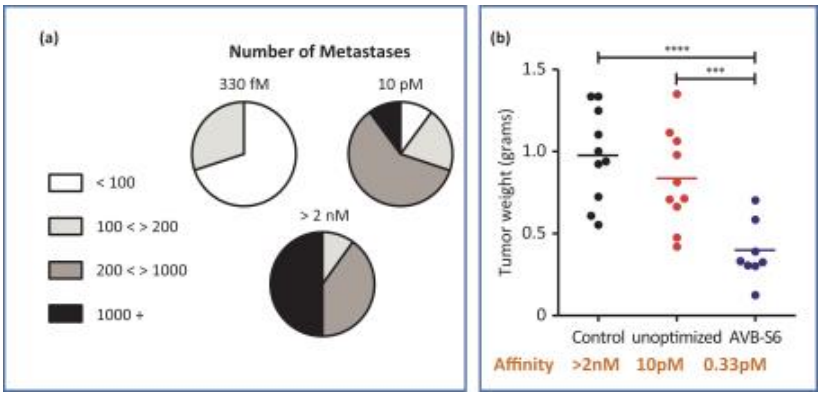


Figure 4 of OVCAR8 JCI 2017 127(1) 183-195

The following graphic indicates that the affinity of AVB-S6 proteins relates to anti-metastatic effect in preclinical studies. The left panel shows the number of metastases from the peritoneum of OVCAR8 (human platinum-resistant ovarian cancer) mouse model following treatment with three AVB-S6 proteins having different affinity (330 fM, 10 pM and >2 nM). The right panel shows the total tumor weight from the peritoneum of OVCAR8 mouse model following treatment with the same three AVB-S6 proteins.



AVB-S6 proteins inhibit invasion and migration of highly invasive and metastatic cells, MDA-MB-231 and OVCAR8. *In vivo* studies with AVB-S6 proteins demonstrated significant reductions in metastatic tumor weight and number in platinum resistant ovarian (SKOV3.IP and OVCAR8) cancer models. In combination with the chemotherapy drug doxorubicin (Dox), the anti-metastatic effect was greater, and 20-30% of the animals were tumor-free after the combination treatment in both platinum-resistant ovarian cancer studies.

The following graphic indicates that AVB-S6 augments the efficacy of doxorubicin in a preclinical platinum resistant ovarian cancer model (SKOV3.IP).

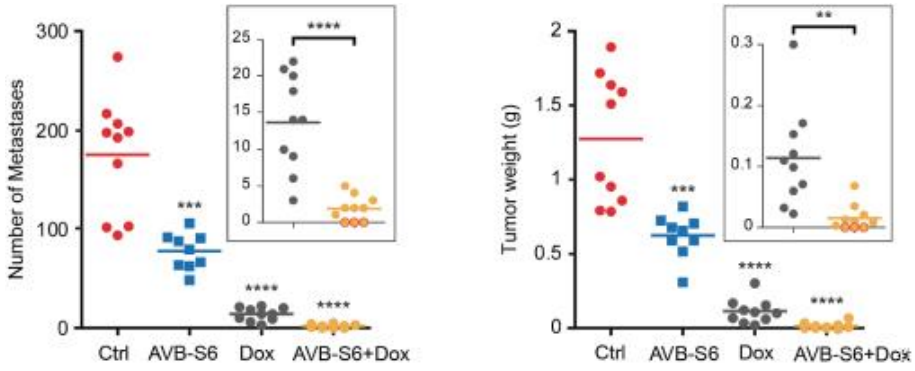


Figure 6B from JCI 2017; (127)(1) 183-198

AVB-S6 proteins also demonstrated significant reductions in metastatic disease in triple negative breast (4T1), pancreatic (PDA1-1), and renal (SN12L1) cancer models. Additionally, in an orthotopic pancreatic model (LM-P) the AVB-S6 protein significantly increased survival in combination with the chemotherapy drug gemcitabine relative to gemcitabine or vehicle alone. The combination studies also demonstrated a relationship between AXL signaling and the cellular response to DNA damage in breast, pancreatic and ovarian cancer models. This relationship was even more pronounced in combination with cytotoxic chemotherapies such as doxorubicin and gemcitabine.

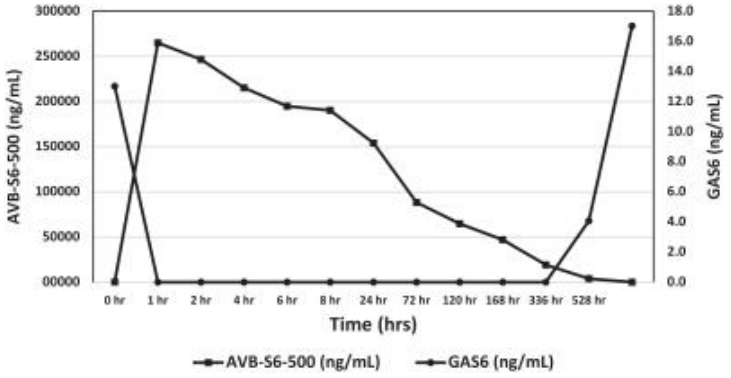
Notably, treatment with the AVB-S6 protein alone or in combination with gemcitabine demonstrated a significant decrease in tumor fibrosis. Decreasing fibrosis in the tumor microenvironment may increase efficacy of co-administered chemotherapeutics and potentially immuno-therapeutics by allowing greater access of T cells to the tumor cells.

Once the development candidate, AVB-500, was selected, *in vitro* and *in vivo* pharmacology studies were conducted to demonstrate that AVB-500 had the same biological activity as the other AVB-S6 proteins.

Biomarker

GAS6 expression in tumors has been reported to be an adverse prognostic factor in several cancers, including urothelial, ovarian, lung adenocarcinoma, gastric cancer, glioblastoma, oral squamous cell carcinoma, liver carcinoma, and renal cell carcinoma. In studies conducted by us, AVB-S6 proteins bind GAS6 with higher affinity than the endogenous AXL protein and prevent GAS6 signaling at the AXL receptor. Preclinical efficacy data for the AVB-S6 program demonstrated a relationship between reduced serum GAS6 and an anti-metastatic effect. We have developed an assay designed to measure GAS6 levels in the blood before and after dosing of our development candidate. In the presence of a pharmacologically active dose of AVB-S6, serum GAS6 has not been detectable. Thus, GAS6 levels in the blood of patients may be a pharmacodynamic biomarker that can aid AVB-S6 dose selection and potentially serve as a predictive biomarker for response to treatment with AVB-S6.

The following graphic indicates the relationship between AVB-500 protein levels and GAS6 levels in blood from humans participating in the AVB-500 first in human trial.



Manufacturing

Manufacturing of our clinical trial material consists of three main phases, the production of bulk protein (drug substance), formulation/filling operations, and labelling/packaging operations of the finished product. The protein has been manufactured at high yield and with high purity. The clinical bulk drug substance is produced using industry standard manufacturing processes, as is the drug product.

Since September 2017, we have relied on a third party contract manufacturer to manufacture clinical bulk drug substance and drug product of AVB-500 using a cell line and process developed by our contract manufacturer that has been licensed to us on a non-exclusive basis. We have manufactured enough AVB-500 to dose approximately 400 patients for a six-month period, which is expected to be sufficient to complete the planned Phase 1b/Phase 2 ovarian cancer trial. The clinical bulk drug substance and drug product is manufactured pursuant to the terms of a five year Master Manufacturing Services Agreement that we entered into with our contract manufacturer in July 2016, which agreement automatically renews for successive one (1) year periods, unless either party provides written notice to the other party of its desire not to renew at least 90 days prior to the expiration of the then-current term. The Master Manufacturing Services Agreement is terminable by us upon 45 days prior written notice, by our contract manufacturer Limited upon 180 days prior written notice provided that all statements of work in progress at such time are completed and upon 60 days prior written notice upon a breach of the terms of the agreement if such breach is not cured within such 60 day period.

We have also contracted with an independent third party located in Texas for the labeling, packaging, and distribution of our injectable protein.

Our personnel have significant technical, manufacturing, analytical, quality and project management experience to execute and manage manufacturing process development, plus oversee the manufacture, testing, quality release, storage and distribution of drug products according to the current Good Manufacturing Practice, or cGMPs, promulgated by the FDA and other regulatory requirements. The cGMP regulations include requirements relating to the organization of personnel, buildings and facilities, equipment, control of components and drug product containers and closures, production and process controls, packaging and labeling controls, holding and distribution, laboratory controls, records and reports, and returned or salvaged products. Our facilities, and our third-party manufacturers, may be subject to periodic inspections by FDA and local authorities, which include, but are not limited to procedures and operations used in the testing and manufacture of our biological drug candidates to assess our compliance with applicable regulations. Failure to comply with statutory and regulatory requirements subjects a manufacturer to possible legal or regulatory action, including warning letters, the seizure or recall of products, injunctions, and consent decrees causing significant restrictions on or suspending manufacturing operations plus causing possible civil and criminal penalties. These actions could have a material impact on the availability of its biological drug candidates. Similar to contract manufacturers, we may encounter difficulties involving production yields, quality control and quality assurance, as well as shortages of qualified personnel.

Research and Development

We have made and will continue to make substantial investments in research and development. Our research and development expenses totaled $12.8 million and $11.1 million for the years ended December 31, 2019 and 2018, respectively.

In the ordinary course of business, we enter into agreements with third parties, such as clinical research organizations, medical institutions, clinical investigators and contract laboratories, to conduct clinical trials and aspects of research and preclinical testing. These third parties provide project management and monitoring services and regulatory consulting and investigative services.

Competition

The biotechnology and pharmaceutical industries are characterized by intense competition to develop new technologies and proprietary products. We face competition from many different sources, including biotechnology and pharmaceutical companies, academic institutions, government agencies, as well as public and private research institutions. Any products that we may commercialize will have to compete with existing products and therapies as well as new products and therapies that may become available in the future.

At this time, there are no FDA or European Medicines Agency approved therapies targeting GAS6. We believe this mechanism of action represents a novel approach to inhibiting tumor growth and metastasis, as well as addressing tumor immune evasion and resistance to other anticancer agents. Exelixis, Inc. markets cabozantinib, a Tyrosine Kinase Inhibitor which is the only currently marketed compound that inhibits AXL in addition to inhibiting several other kinases. We are aware of a number of companies focused on developing AXL inhibitors in various indications, including BerGenBio ASA, Astellas Pharma Inc., Mirati Therapeutics, Inc., Les Laboratoires Servier, SAS, Eli Lilly and Company, Bristol-Myers Squibb Company, Tolero Pharmaceuticals, Inc., Ignyta, Inc., as well as several companies addressing AXL inhibitors, and PARP 1/2 inhibitors and related signaling pathways.

Our competition may also include companies that are or will be developing therapies for the same therapeutic areas that we are targeting, including ovarian cancer, renal cell carcinoma and IgAN. Many of our potential competitors, alone or with their strategic partners may have substantially greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. These competitors also compete with us in recruiting and retaining qualified scientific and management personal, establishing clinical trial sites and patient registration for clinical trials, and in acquiring technologies complementary to, or necessary for our programs.

There are no approved drugs for the treatment of IgA nephropathy and a few therapies are currently in development. Three current development programs target the complement pathway: Omeros Corporation is conducting a phase 3 clinical trial with an injectable MASP-2 inhibitor; Novartis AG is conducting a phase 2 clinical trial with their oral compound, LNP023; and Apellis Pharmaceuticals, Inc. is conducting a phase 2 clinical trial with APL2. Two other programs target B cell activity: EMD Serono Research & Development Institute, Inc. is testing Atacicept in a phase 2 clinical trial and Visterra Inc. is in the midst of testing VIS649in a phase I healthy volunteer clinical trial. AVB-500 has a mechanism of action unique from these other therapies.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that it may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for our product candidates, which could result in our competitors establishing a strong market position before it is able to enter the market. In addition, our ability to compete may be affected in many cases by insurers or other third party payors seeking to encourage the use of generic products.

License Agreement

In 2012, Private Aravive entered into an exclusive license agreement with Leland Stanford Junior University, or Stanford University, for intellectual and tangible property rights relating to biologic inhibitors for therapeutic targeting the receptor tyrosine kinase AXL. The license agreement was amended in 2012, 2015 and 2017 to modify certain of the stated milestones and expand the patent rights granted to Private Aravive. The term of the license is the length of the last to expire patent. The license agreement grants Private Aravive exclusive, worldwide rights to make, use or sell licensed materials based upon the following patent-related rights:

- U.S. patent application: Serial number PCT/US2012/069841, filed December 14, 2012; Serial Number 13/714,875, filed December 14, 2012 ; Serial Number PCT/US2013/074786, filed December 12, 2013; Serial Number 14/650,854, filed June 9, 2015; Serial Number PCT/US2015/066498, filed December 17, 2015; Serial Number 15/535,995, filed June 14, 2017; which patents are jointly owned with Private Aravive and all U.S. patents and foreign patents and patent applications based on the application; as well as all divisionals, continuations, and those claims in continuations-in-parts to the extent they are sufficiently described in the application, and any re-examinations or reissues of the foregoing.
- U.S. patent application: Serial Number PCT/US2011/022125, filed January 21, 2011; Serial Number 13/554,954, filed July 20, 2012; Serial Number 13/595,936, filed August 27, 2012; Serial Number 13/950,111, filed July 24, 2013; Serial Number 14/712,731, filed May 14, 2015; which patents are solely owned by Stanford University, and all U.S. patents and foreign patents and patent applications based on the application; as well as all divisionals, continuations, and those claims in continuations-in-parts to the extent they are sufficiently described in the application, and any re-examinations or reissues of the foregoing.

As consideration for the rights granted in the license agreement, Private Aravive is obligated to pay Stanford University yearly license fees and milestone payments, and a royalty based on net sales of products covered by the patent-related rights set forth above. More specifically, Private Aravive is obligated to pay Stanford University (i) annual license payments, (ii) milestone payments of up to an aggregate of $1,000,000 upon achievement of clinical and regulatory milestones, and (iii) royalties equal to a percentage (in the low single digits) of net sales of licensed products; provided that the annual license payments made will offset (and be credited against) any royalties due in such license year. In the event of a sublicense to a third party of any rights based on the patents that are solely owned by Stanford University, Private Aravive is obligated to pay royalties to Stanford University equal to a percentage of what Private Aravive would have been required to pay to Stanford University had it sold the products under sublicense itself. In addition, in such event Private Aravive is required to pay to Stanford University a percent of sublicensing income. The license agreement may be terminated by Stanford University upon 30 days written notice if Private Aravive breaches its obligations thereunder, including failing to make any milestone or other required payments or to exercise diligence to bring licensed products to market. In the event of a termination, Private Aravive will be obligated to pay all amounts that accrued prior to such termination. The license agreement also contains other customary clauses and terms as are common in similar agreements between industry and academia, including the licensee's agreement to indemnify Stanford University for any liabilities arising out of or related to the licensee's exercise of its rights under, or breach of, the license agreement, the reservation of the licensor of the right to use the licensed intellectual property rights for its internal, non-commercial purposes, limitations/disclaimers of various warranties.

CPRIT Grant

In 2016, Private Aravive was approved for a $20.0 million grant, or the CPRIT Grant, from CPRIT for development of AVB-S6. The CPRIT Grant is subject to customary CPRIT funding conditions including a matching funds requirement whereby Private Aravive was required to match $0.50 for every $1.00 from CPRIT. Consequently, Private Aravive was required to raise $10.0 million in matching funds, and it raised $11.4 million since 2016. The grant award, as is customary for all CPRIT awards, contains a requirement that Private Aravive pay CPRIT a tiered royalty on sales of commercial products developed using CPRIT funds equal to a low- to mid-single digit percentage of revenue until such time as CPRIT has been paid an aggregate amount equal to 400% of the grant award proceeds. After 400% of the grant award proceeds has been paid, Private Aravive Biologics will be obligated to pay CPRIT a royalty of less than one percent for as long as Private Aravive maintains government exclusivity. The CPRIT Grant contract terminated on November 30, 2019. After the termination date, we are not permitted to retain any unused grant award proceeds without CPRIT's approval, but our royalty and other obligations, including our obligation to repay the disbursed grant proceeds under certain circumstances, to maintain certain records and documentation, to notify CPRIT of certain unexpected adverse events and our obligation to use reasonable efforts to ensure that any new or expanded preclinical testing, clinical trials, commercialization or manufacturing related to any aspect of our CPRIT project take place in Texas, survive the termination of the agreement. In addition, if we relocate our principal place of business outside of Texas within the three year period after the date of final payment of grant funds (which final payment has not yet occurred), we are required to repay to CPRIT all grant funds received. We have received $18.4 million of the grant award proceeds and have expended all of the grant award proceeds by the agreement termination date. We have recorded a CPRIT receivable balance of $1.6 million as of December 31, 2019 in other current assets for the remaining grant award for reimbursement of eligible expenses.

Intellectual Property

We strive to protect and enhance the proprietary technology, inventions and improvements that are commercially important to our business, including seeking, maintaining, and defending patent rights. We also rely on trade secrets relating to our technology and know-how to develop, strengthen and maintain our proprietary position in the field of targeting the GAS6-AXL pathway for the identification and development of therapeutic candidates for cancer therapy and fibrosis. In addition, we rely on regulatory protection afforded through data exclusivity, market exclusivity and patent term extensions where available. We also utilize trademark protection for our company name and expect to do so for products and/or services as they are marketed.

Our commercial success will depend in part on our ability to obtain and maintain patent and other proprietary protection for commercially important technology, inventions and know-how related to our business; defend and enforce our patents; preserve the confidentiality of our trade secrets; and operate without infringing the valid enforceable patents and proprietary rights of third parties. Our ability to stop third parties from making, using, selling, offering to sell or importing our therapeutic candidates may depend on the extent to which we have rights under valid and enforceable patents or trade secrets that cover these activities. With respect to both licensed and company-owned intellectual property, we cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications filed by us in the future, nor can we be sure that any of our existing patents or any patents that may be granted to us in the future will be commercially useful in protecting our commercial products and methods of manufacturing the same.

Our patent position with respect to the GAS6-AXL program is comprised of eight comprehensive patent portfolios containing composition of matter claims relating to novel GAS6-binding fusion proteins, claims to reagents and methods for determining susceptibility or likelihood of a tumor to become invasive and/or metastatic, and claims to the use of our novel fusion proteins for the treatment of various oncological conditions, as well as antiviral and antifibrotic disorders. Our license agreement with Stanford University provides us with exclusive rights to intellectual property, or IP, that is either solely owned by Stanford (Portfolio I below) or co-owned by Stanford and us (Portfolios II, III, and V below). We also have rights to IP that we solely own (Portfolio IV and VI-VIII below)

As of February 28, 2020, we have exclusive rights to 31 issued patents (including the 18 validated EP countries) and six pending patent applications that are the subject of the license agreement with Stanford University. The expiration date for those patents/patent applications is 2031. We also have exclusive rights to 23 issued patents (including the 18 validated EP countries) and 10 pending applications that are jointly owned with Stanford University and that are the subject of the license agreement with Stanford. The expiration dates for those patents/patent applications range from 2033-2035. We have one issued patent and two pending patents that we solely own. The expiration dates for those patents range from 2035-2038. Additional details on our relevant portfolios is provided below:

- **Portfolio I**— “Inhibition of AXL Signaling in Anti-Metastatic Therapy” 13 Granted Patents*—6 Pending Applications US8618254, US9074192, US9266927, US20160108378, AU2011207381, BR112012018022-3, CA2786149, CN-ZL201180014940, CN201610819620.7, EP2525824 (*Validated in 18 EP countries), EP17159334.6, HK 1242355 (Recorded), HK 1245806 (Recorded), IN6649/CHENP/2012, JP5965322, KR 127996-6, KR10-20197004772, RU2556822, ZA2012/04866, ZA2013/07676
- **Portfolio II**— “Inhibition Of AXL/GAS6 Signaling in the Treatment Of Disease” 1 Granted US Patent—1 Pending US Application US9,879,061, US20180094034
- **Portfolio III**— “Modified AXL Peptides and Their Use in Inhibition of AXL Signaling in Anti- Metastatic Therapy” 4 Granted Patents**—5 Pending Applications US9822347, US15/783,850, AU2013359179, AU2017272193, CA2894539, EP13862780.7 (**Validated in 18 EP countries), EP17196662.5, JP2015-547567, JP2018098435, HK 181151327 (Recorded)
- **Portfolio IV**— “Antiviral Activity of GAS6 Inhibitor” 1 Granted US Patent 1 Pending Application US10137173, CA2909609
- **Portfolio V**— “Antifibrotic Activity of GAS6 Inhibitor” 4 Pending Applications US15/535,995, AU2015364437, CA2971406, EP15871120.0 HK181041704 (Recorded)
- **Portfolio VI**— “Methods of Treating Metastatic Cancers Using Axl Decoy Receptors” 1 Pending Application PCT/US2018/059218
- **Portfolio VII**— “Methods of Treating Immunoglobulin A Nephropathy (IgAN) Using Axl Decoy Receptors” Pending Application US62/818107
- **Portfolio VIII**— “Methods of Treating Clear Cell Renal Cell Carcinoma (ccRCC) Using Axl Decoy Receptors” 1 Pending Application US62/957622

In the future, we expect to continue prosecuting broader coverage of certain composition of matter applications. Additionally, we will seek to file new patents related to novel candidates, manufacturing, clinical formulations, dose, and indications, as well as evaluate the acquisition of other innovative IP.

The term of individual patents depends upon the legal term of the patents in the countries in which they are obtained. In most countries in which we file, the patent term is 20 years from the date of filing the non-provisional application. In the United States, a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the U.S. Patent and Trademark Office in granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier-filed patent.

The term of a patent that covers an FDA-approved drug may also be eligible for patent term extension, which permits patent term restoration of a U.S. patent as compensation for the patent term lost during the FDA regulatory review process. The Hatch-Waxman Act permits a patent term extension of up to five years beyond the expiration of the patent. The length of the patent term extension is related to the length of time the drug is under regulatory review. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only one patent applicable to an approved drug may be extended. Moreover, a patent can only be extended once, and thus, if a single patent is applicable to multiple products, it can only be extended based on one product. Similar provisions are available in Europe and other foreign jurisdictions to extend the term of a patent that covers an approved drug. When possible, depending upon the length of clinical trials and other factors involved in the filing of a new drug application, or NDA, we expect to apply for patent term extensions for patents covering its therapeutics candidates and their methods of use.

We may rely, in some circumstances, on trade secrets to protect our technology. However, trade secrets can be difficult to protect. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these procedures, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our consultants, contractors or collaborators use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Government Regulation

Federal, state and local government authorities in the United States and in other countries extensively regulate, among other things, the research, development, testing, manufacturing, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of biological and pharmaceutical products such as those we are developing. Our product candidates must be approved by the FDA before they may be legally marketed in the United States and by the appropriate foreign regulatory agency before they may be legally marketed in foreign countries. The process for obtaining regulatory marketing approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. Drug Approval Process

In the United States, the FDA regulates pharmaceutical and biological products under the Federal Food, Drug and Cosmetic Act, Public Health Service Act, or PHSA, and implementing regulations. Products are also subject to other federal, state and local statutes and regulations. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant to administrative or judicial sanctions. FDA sanctions could include, among other actions, refusal to approve pending applications, withdrawal of an approval, a clinical hold, warning letters, product recalls or withdrawals from the market, product seizures, total or partial suspension of production or distribution injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us. The process required by the FDA before a drug or biological product may be marketed in the United States generally involves the following:

- completion of nonclinical laboratory tests and animal studies according to good laboratory practices, or GLPs, and applicable requirements for the humane use of laboratory animals or other applicable regulations;
- submission to the FDA of an IND or Investigational New Drug which must become effective before human clinical trials may begin;
- performance of adequate and well-controlled human clinical trials according to the FDA's regulations commonly referred to as good clinical practices, or GCPs, and any additional requirements for the protection of human research subjects and their health information, to establish the safety and efficacy of the proposed biological product for its intended use;
- submission to the FDA of a Biologics License Application, or BLA, for marketing approval that meets applicable requirements to ensure the continued safety, purity, and potency of the product that is the subject of the BLA based on results of nonclinical testing and clinical trials;

- satisfactory completion of an FDA inspection of the manufacturing facility or facilities where the biological product is produced, to assess compliance with cGMP, to assure that the facilities, methods and controls are adequate to preserve the biological product's identity, strength, quality and purity;
- potential FDA audit of the nonclinical trial and clinical trial sites that generated the data in support of the BLA; and
- FDA review and approval, or licensure, of the BLA.

Before testing any biological development candidate in humans, the candidate enters the preclinical testing stage. Preclinical tests, also referred to as nonclinical studies, include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the candidate. The conduct of the preclinical tests must comply with federal regulations and requirements including GLPs. The clinical trial sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. Some preclinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA raises concerns or questions regarding the proposed clinical trials and places the trial on a clinical hold within that 30-day time period. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. The FDA may also impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, trials may not recommence without FDA authorization and then only under terms authorized by the FDA. Accordingly, we cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that suspend or terminate such trials.

Clinical trials involve the administration of the biological product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria, and the parameters to be used to monitor subject safety, including stopping rules that assure a clinical trial will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND. Clinical trials must be conducted and monitored in accordance with the FDA's regulations composing the GCP requirements, including the requirement that all research subjects provide informed consent. Further, each clinical trial must be reviewed and approved by an independent institutional review board, or IRB, at or servicing each institution at which the clinical trial will be conducted. An IRB is charged with protecting the welfare and rights of trial participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the form and content of the informed consent that must be signed by each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed. Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- *Phase 1*. The biological product is initially introduced into healthy human volunteers and tested for safety. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients with the targeted disease.
- *Phase 2*. The biological product is evaluated in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance, optimal dosage and dosing schedule.
- *Phase 3*. Clinical trials are undertaken to further evaluate dosage, clinical efficacy, potency, and safety in an expanded patient population at geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk to benefit ratio of the product and provide an adequate basis for product labeling.

Post-approval clinical trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These clinical trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication, particularly for long-term safety follow-up.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data, and clinical trial investigators. Annual progress reports detailing the results of the clinical trials must be submitted to the FDA. Written IND safety reports must be promptly submitted to the FDA and the investigators for serious and unexpected adverse events, any findings from other studies, tests in laboratory animals or in vitro testing that suggest a significant risk for human subjects, or any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor or its data safety monitoring board may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the biological product has been associated with unexpected serious harm to subjects.

Concurrently with clinical trials, companies usually complete additional studies and must also develop additional information about the physical characteristics of the biological product as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. To help reduce the risk of the introduction of adventitious agents with use of biological products, the PHSA emphasizes the importance of manufacturing control for products whose attributes cannot be precisely defined. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other criteria, the sponsor must develop methods for testing the identity, strength, quality, potency and purity of the final biological product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the biological product candidate does not undergo unacceptable deterioration over its shelf life.

U.S. Review and Approval Processes

After the completion of clinical trials of a biological product, FDA approval of a BLA must be obtained before commercial marketing of the biological product. The BLA must include results of product development, laboratory and animal studies, human trials, information on the manufacture and composition of the product, proposed labeling and other relevant information. The FDA may grant deferrals for submission of data, or full or partial waivers. The testing and approval processes require substantial time and effort and there can be no assurance that the FDA will accept the BLA for filing and, even if filed, that any approval will be granted on a timely basis, if at all.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each BLA must be accompanied by a significant user fee. The FDA adjusts the PDUFA user fees on an annual basis. PDUFA also imposes an annual program fee on approved biological products. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. No user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA has a Fast Track program that is intended to expedite or facilitate the process for reviewing new drugs and biological products that meet certain criteria. Specifically, new biological products are eligible for Fast Track designation if they are intended to treat a serious or life-threatening condition and demonstrate the potential to address unmet medical needs for the condition. Fast Track designation applies to the combination of the product and the specific indication for which it is being studied. For a Fast Track biological product, the FDA may consider review of completed sections of a BLA on a rolling basis provided the sponsor provides, and the FDA accepts, a schedule for the submission of the completed sections of the BLA. Under these circumstances, the sponsor pays any required user fees upon submission of the first section of the BLA. A Fast Track designated drug candidate may also qualify for priority review, under which the FDA reviews the BLA in a total of six months rather than ten months after it is accepted for filing.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the agency accepts it for filing. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission, and may request additional information. In this event, the BLA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review of the BLA. The FDA reviews the BLA to determine, among other things, whether the proposed product is safe, potent, and/or effective for its intended use, and has an acceptable purity profile, and whether the product is being manufactured in accordance with cGMP to assure and preserve the product's identity, safety, strength, quality, potency and purity. The FDA may refer applications for novel biological products or biological products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. During the biological product approval process, the FDA also will determine whether a Risk Evaluation and Mitigation Strategy, or REMS, is necessary to assure the safe use of the biological product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS. The FDA will not approve a BLA without a REMS, if required.

Before approving a BLA, the FDA will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure that the clinical trials were conducted in compliance with IND trial requirements and GCP requirements. To assure cGMP and GCP compliance, an applicant must incur significant expenditure of time, money and effort in the areas of training, record keeping, production, and quality control.

Notwithstanding the submission of relevant data and information, the FDA may ultimately decide that the BLA does not satisfy its regulatory criteria for approval and deny approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data. If the agency decides not to approve the BLA in its present form, the FDA will issue a complete response letter that describes all of the specific deficiencies in the BLA identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. Additionally, the complete response letter may include recommended actions that the applicant might take to place the application in a condition for approval. If a complete response letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product.

Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a risk management plan, or otherwise limit the scope of any approval. In addition, the FDA may require post marketing clinical trials, sometimes referred to as Phase 4 clinical trials, designed to further assess a biological product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized.

In addition, under the Pediatric Research Equity Act, a BLA or supplement to a BLA must contain data to assess the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may grant deferrals for submission of data or full or partial waivers.

Post-Approval Requirements

Any products for which we receive FDA approvals are subject to continuing regulation by the FDA, including, among other things, record-keeping requirements, reporting of adverse experiences with the product, providing the FDA with updated safety and efficacy information, product sampling and distribution requirements, and complying with FDA promotion and advertising requirements, which include, among others, standards for direct-to-consumer advertising, restrictions on promoting products for uses or in patient populations that are not described in the product's approved uses, known as 'off-label' use, limitations on industry-sponsored scientific and educational activities, and requirements for promotional activities involving the internet. Although physicians may prescribe legally available products for off-label uses, if the physicians deem to be appropriate in their professional medical judgment, manufacturers may not market or promote such off-label uses.

In addition, quality control and manufacturing procedures must continue to conform to applicable manufacturing requirements after approval to ensure the long-term stability of the product. cGMP regulations require among other things, quality control and quality assurance as well as the corresponding maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP and other laws. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance. Discovery of problems with a product after approval may result in restrictions on a product, manufacturer, or holder of an approved BLA, including, among other things, recall or withdrawal of the product from the market. In addition, changes to the manufacturing process are strictly regulated, and depending on the significance of the change, may require prior FDA approval before being implemented. Other types of changes to the approved product, such as adding new indications and claims, are also subject to further FDA review and approval.

The FDA also may require post-marketing testing, known as Phase 4 testing, and surveillance to monitor the effects of an approved product. Discovery of previously unknown problems with a product or the failure to comply with applicable FDA requirements can have negative consequences, including adverse publicity, judicial or administrative enforcement, warning letters from the FDA, mandated corrective advertising or communications with doctors, and civil or criminal penalties, among others. Newly discovered or developed safety or effectiveness data may require changes to a product's approved labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our product candidates under development.

Other U.S. Healthcare Laws and Compliance Requirements

In the United States, our activities are potentially subject to regulation by various federal, state and local authorities in addition to the FDA, including but not limited to, the Centers for Medicare and Medicaid Services, or CMS, other divisions of the U.S. Department of Health and Human Services, for instance the Office of Inspector General, the U.S. Department of Justice, or DOJ, and individual U.S. Attorney offices within the DOJ, and state and local governments. For example, sales, marketing and scientific/educational grant programs must comply with the anti-fraud and abuse provisions of the Social Security Act, the false claims laws, the physician payment transparency laws, the privacy and security provisions of HIPAA, as amended by HITECH, and similar state laws, each as amended.

The federal anti-kickback statute prohibits, among other things, any person or entity, from knowingly and willfully offering, paying, soliciting or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for purchasing, leasing, ordering or arranging for the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. The term remuneration has been interpreted broadly to include anything of value. The anti-kickback statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers, and formulary managers on the other. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution. The exceptions and safe harbors are drawn narrowly and practices that involve remuneration that may be alleged to be intended to induce prescribing, purchasing or recommending may be subject to scrutiny if they do not qualify for an exception or safe harbor. Our practices may not in all cases meet all of the criteria for protection under a statutory exception or regulatory safe harbor. Failure to meet all of the requirements of a particular applicable statutory exception or regulatory safe harbor, however, does not make the conduct per se illegal under the anti-kickback statute. Instead, the legality of the arrangement will be evaluated on a case-by-case basis based on a cumulative review of all of its facts and circumstances. Violations of this law are punishable by imprisonment, criminal fines, administrative civil money penalties and exclusion from participation in federal healthcare programs.

Additionally, the intent standard under the anti-kickback statute was amended by the Affordable Care Act to a stricter standard such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the ACA, provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act., as discussed below.

The civil monetary penalties statute imposes penalties against any person or entity that, among other things, is determined to have presented or caused to be presented a claim to a federal health program that the person knows or should know is for an item or service that was not provided as claimed or is false or fraudulent.

Although we would not submit claims directly to payors, drug manufacturers can be held liable under the federal civil False Claims Act, which imposes civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities (including manufacturers) for, among other things, knowingly presenting, or causing to be presented to federal programs (including Medicare and Medicaid) claims for items or services, including drugs, that are false or fraudulent, claims for items or services not provided as claimed, or claims for medically unnecessary items or services; making a false statement or record material to payment of a false claim; or avoiding, decreasing or concealing an obligation to pay money to the federal government. Penalties for a False Claims Act violation include three times the actual damages sustained by the government, plus mandatory civil penalties for each separate false claim, the potential for exclusion from participation in federal healthcare programs and, although the federal False Claims Act is a civil statute, conduct that results in a False Claims Act violation may also implicate various federal criminal statutes. The government may deem manufacturers to have “caused” the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. Claims which include items or services resulting from a violation of the federal Anti-Kickback Statute are false or fraudulent claims for purposes of the False Claims Act. Our future marketing and activities relating to the reporting of wholesaler or estimated retail prices for our products, if approved, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party reimbursement for our products, and the sale and marketing of our product and any future product candidates, are subject to scrutiny under this law. Pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Other companies have been prosecuted for causing false claims to be submitted because of the companies’ marketing of the product for unapproved, and thus non-reimbursable, uses.

HIPAA created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud or to obtain, by means of false or fraudulent pretenses, representations or promises, any money or property owned by, or under the control or custody of, any healthcare benefit program, including private third party payors and knowingly and willfully falsifying, concealing or covering up by trick, scheme or device, a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the federal anti-kickback statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

We may be subject to data privacy and security regulations by both the federal government and the states in which we conduct business. HIPAA, as amended by the HITECH Act, and their respective implementing regulations, . imposes requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA’s privacy and security standards directly applicable to business associates, defined as independent contractors or agents of covered entities, which include health care providers, health plans, and healthcare clearinghouse, that create, receive, or obtain protected health information in connection with providing a service on behalf of a covered entity. HITECH also increased the civil and criminal penalties that may be imposed against covered entities and business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorney’s fees and costs associated with pursuing federal civil actions. In addition, certain state laws govern the privacy and security of health information in specified circumstances, some of which are more stringent and many of which differ from each other in significant ways, thus complicating compliance efforts. Failure to comply with these laws, where applicable, can result in the imposition of significant civil and criminal penalties.

Additionally, the Federal Physician Payments Sunshine Act under the ACA, and its implementing regulations, require that certain manufacturers of drugs, devices, biological and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, (with certain exceptions), to annually report to the Centers for Medicare and Medicaid, or CMS, information related to certain payments or other transfers of value made or distributed to physicians and teaching hospitals, or to entities or individuals at the request of, or designated on behalf of, the physicians and teaching hospitals and to report annually certain ownership and investment interests held by physicians and their immediate family members. Failure to submit timely, accurately, and completely the required information may result in civil monetary penalties. of up to an aggregate of $150,000 per year and up to an aggregate of $1 million per year for "knowing failures". Certain states also mandate implementation of compliance programs, impose restrictions on pharmaceutical manufacturer marketing practices and/or require the tracking and reporting of gifts, compensation and other remuneration to healthcare providers and entities.

In order to distribute products commercially, we must also comply with state laws that require the registration of manufacturers and wholesale distributors of drug and biological products in a state, including, in certain states, manufacturers and distributors who ship products into the state even if such manufacturers or distributors have no place of business within the state. Some states also impose requirements on manufacturers and distributors to establish the pedigree of product in the chain of distribution, including some states that require manufacturers and others to adopt new technology capable of tracking and tracing product as it moves through the distribution chain. Several states have enacted legislation requiring pharmaceutical and biotechnology companies to establish marketing compliance programs, file periodic reports with the state, make periodic public disclosures on sales, marketing, pricing, clinical trials and other activities, and/or register their sales representatives, as well as to prohibit pharmacies and other healthcare entities from providing certain physician prescribing data to pharmaceutical and biotechnology companies for use in sales and marketing, and to prohibit certain other sales and marketing practices. All of our activities are potentially subject to federal and state consumer protection and unfair competition laws.

If our operations are found to be in violation of any of the federal and state healthcare laws described above or any other governmental regulations that apply to it, we may be subject to penalties, including without limitation, significant civil, criminal and/or administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participation in government programs, such as Medicare and Medicaid, injunctions, private "qui tam" actions brought by individual whistleblowers in the name of the government, or refusal to enter into government contracts, contractual damages, reputational harm, administrative burdens, diminished profits and future earnings, and the curtailment or restructuring of operations, any of which could adversely affect our ability to operate our business and our results of operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time- and resource-consuming and can divert a company's attention from the business.

Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we obtain regulatory approval. In the United States and markets in other countries, sales of any products for which we receive regulatory approval for commercial sale will depend, in part, on the extent to that third-party payors provide coverage, and establish adequate reimbursement levels for such products. In the United States, third-party payors include federal and state healthcare programs, private managed care providers, health insurers and other organizations. The process for determining whether a third-party payor will provide coverage for a product may be separate from the process for setting the price of a product or for establishing the reimbursement rate that such a payor will pay for the product. Third-party payors may limit coverage to specific products on an approved list, also known as a formulary, which might not include all of the FDA-approved products for a particular indication. Third-party payors are increasingly challenging the price, examining the medical necessity and reviewing the cost- effectiveness of medical products, therapies and services, in addition to questioning their safety and efficacy. We may need to conduct expensive pharmaco-economic studies in order to demonstrate the medical necessity and cost-effectiveness of our product candidates, in addition to the costs required to obtain the FDA approvals. Our product candidates may not be considered medically necessary or cost-effective. A payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Adequate third party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on investment in product development.

Different pricing and reimbursement schemes exist in other countries. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical trials that compare the cost-effectiveness of a particular product candidate to currently available therapies. Other countries allow companies to fix their own prices for medicines, but monitor and control company profits. The downward pressure on health care costs has become very intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country.

The marketability of any product candidate for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, emphasis on managed care in the United States has increased and we expect the pressure on healthcare pricing will continue to increase. Coverage policies and third party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

U.S. Healthcare Reform

In the United States and some foreign jurisdictions, there have been, and likely will continue to be, a number of legislative and regulatory changes and proposed changes regarding the healthcare system directed at broadening the availability of healthcare, improving the quality of healthcare, and containing or lowering the cost of healthcare.

Some of the provisions of the ACA have yet to be fully implemented, while certain provisions have been subject to judicial and Congressional challenges. It is unclear how these challenges and other efforts to repeal and replace the Affordable Care Act will impact our business in the future.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. Additionally, there have been several recent U.S. Congressional inquiries and proposed bills designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs and reform government program reimbursement methodologies for drugs.

We cannot predict what healthcare reform initiatives may be adopted in the future. Further federal, state and foreign legislative and regulatory developments are likely, and we expect ongoing initiatives to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from product candidates and may affect our overall financial condition and ability to develop product candidates.

We anticipate that current and future U.S. legislative healthcare reforms may result in additional downward pressure on the price that we receive for any approved product, if covered, and could seriously harm our business. Any reduction in reimbursement from Medicare and other government programs may result in a similar reduction in payments from private payors.

Foreign Regulation

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, it would need to obtain the necessary approvals by the comparable foreign regulatory authorities before it can commence clinical trials or marketing of the product in foreign countries and jurisdictions. Although many of the issues discussed above with respect to the United States apply similarly in the context of the European Union, the approval process varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

European Data Collection

The collection and use of personal health data in the European Economic Area (EEA) is governed by the General Data Protection Regulation 2016/679 (or GDPR), which became effective May 25, 2018. The GDPR applies to any company established in the EEA and to companies established outside the EEA that process personal data in connection with the offering of goods or services to data subjects in the EU or the monitoring of the behavior of data subjects in the EU. The GDPR enhances data protection obligations for data controllers of personal data (including stringent requirements relating to the consent of data subjects, expanded disclosures about how personal data is used, requirements to conduct privacy impact assessments for “high risk” processing, limitations on retention of personal data, mandatory data breach notification and “privacy by design” requirements) and creates direct obligations on service providers acting as data processors. The GDPR also imposes strict rules on the transfer of personal data outside of the EEA to countries that do not ensure an adequate level of protection, like the U.S. Failure to comply with the requirements of the GDPR and the related national data protection laws of the EEA Member States may result in fines up to 20 million Euros or 4% of a company’s global annual revenues for the preceding financial year, whichever is higher. Moreover, the GDPR grants data subjects the right to claim material and non material damages resulting from infringement of the GDPR. Given the breadth and depth of changes in data protection obligations, maintaining compliance with the GDPR, will require significant time, resources and expense, and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects**.**

Employees

Our management and scientific teams possess considerable experience in drug discovery, research, manufacturing, clinical development and regulatory matters. Our research team includes Pharm.D. Ph.D.-level scientists with expertise in cancer biology. As of December 31, 2019, we had 17 employees, 16 were full-time employees. We have no collective bargaining agreements with our employees and have not experienced any work stoppages. We consider our relations with our employees to be good.

Corporate Information

We were incorporated under the laws of the State of Delaware in December 2008 under the name Versartis, Inc. and completed our initial public offering in March 2014. Private Aravive was incorporated under the laws of the State of Delaware in April 2007, originally under the name of Hypoximed, Inc, which name was changed to Ruga Corporation in July 2009 and changed to Aravive Biologics, Inc. in October 2016. On October 12, 2018, we, then known as Versartis, Inc. and Private Aravive, completed the Merger, pursuant to which Private Aravive survived as our wholly owned subsidiary. In connection with the completion of the Merger, on October 15, 2018, we changed our name from Versartis, Inc. to "Aravive, Inc."

Available Information

Our website address is www.aravive.com. We file Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, proxy statements and other materials with the Securities and Exchange Commission, or SEC. We are subject to the informational requirements of the Exchange Act and file or furnish reports, proxy statements and other information with the SEC. Such reports and other information filed by the Company with the SEC are available free of charge on our website at http://ir.aravive.com/investors/financial-information. Information contained on, or that can be accessed through, our website is not incorporated by reference into this Annual Report on Form 10-K, and you should not consider information on our website to be part of this Annual Report on Form 10-K

The SEC also maintains a website that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC at www.sec.gov.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should consider carefully the following risks, together with all the other information in this Annual Report on Form 10-K, including the section titled "Cautionary Note Regarding Forward-Looking Statements," and Part II, Item 7."Management's Discussion and Analysis of Financial Condition and Results of Operation" and our consolidated financial statements and the accompanying notes included elsewhere in this Annual Report on Form 10-K. The risks described below are not the only ones we face. Any of the following risks could materially and adversely affect our business. If any of the following risks actually materializes, our operating results, financial condition and liquidity could be materially adversely affected. As a result, the trading price of our common stock could decline and you could lose part or all of your investment. Our business, financial condition and results of operations could also be harmed by risks and uncertainties not currently known to us or that we currently do not believe are material.

Risks related to our financial position and capital requirements.

We have a limited operating history and have incurred significant losses since our inception, and we anticipate that we will continue to incur substantial and increasing losses for the foreseeable future. We have only one product candidate and no commercial sales, which, together with our limited operating history, makes it difficult to evaluate our business and assess our future viability.

We are a clinical-stage biopharmaceutical company with a limited operating history. We have never generated any product revenue and do not have any products approved for sale. From our inception (under our former corporate name, Versartis, Inc.) in 2008 through September 2017, we were focused on developing a single product candidate, somavaratan, a long-acting form of recombinant human growth hormone. The Phase 3 clinical trial of somavaratan failed to meet its primary endpoint, and we subsequently discontinued our somavaratan development effort. In October 2018, we acquired Private Aravive in a merger whereby Private Aravive became our wholly owned subsidiary. All of our clinical development activities are now carried out through Private Aravive.

Private Aravive was founded in 2007, and its operations to date have been primarily limited to organizing and staffing its company and developing its only product candidate, AVB-500. Private Aravive has not yet successfully completed any clinical trials in the target patient population, obtained marketing approval, manufactured AVB-500 product at commercial scale, or conducted sales and marketing activities that will be necessary to successfully commercialize AVB-500. Consequently, predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing product candidates.

Even if we receive regulatory approval for the sale of any of our product candidates, we do not know when we will begin to generate revenue, if at all. Our ability to generate revenue depends on a number of factors, including our ability to:

- set an acceptable price for our products and obtain coverage and adequate reimbursement from third-party payors;
- establish sales, marketing, manufacturing and distribution systems;
- add operational, financial and management information systems and personnel, including personnel to support our clinical, manufacturing and planned future clinical development and commercialization efforts and operations as a public company;
- develop manufacturing capabilities for bulk materials and manufacture commercial quantities of product candidates at acceptable cost levels;
- achieve broad market acceptance of our product candidates in the medical community and with third-party payors and consumers;
- attract and retain an experienced management and advisory team;
- launch commercial sales of our products, whether alone or in collaboration with others; and
- maintain, expand and protect our intellectual property portfolio.

Because of the numerous risks and uncertainties associated with development and manufacturing, we are unable to predict if we will generate revenue. If we cannot successfully execute on any of the factors listed above, our business may not succeed, we may never generate revenue and your investment will be adversely affected.

We have incurred significant losses since inception and expect to continue to incur significant losses for the foreseeable future and may never achieve or maintain profitability.

We have incurred significant operating losses in each year since our inception and expect to incur substantial and increasing losses for the foreseeable future. As of December 31, 2019, we had an accumulated deficit of approximately $470.1 million. Other than our financial statements for the year ended December 31, 2019 and part of the fourth quarter of 2018, our historical financial statements are solely those of Versartis, Inc., and our accumulated deficit does not reflect the cumulative deficit of Private Aravive.

To date, we have financed our operations primarily through private placements of our equity securities, debt financing, CPRIT grant proceeds, and our initial public offering in 2014 along with additional common stock offerings in January 2015, October 2016, and December 2019 as well as a $40.0 million upfront payment received from our strategic license agreement with Teijin. A significant portion of Private Aravive's funding has been through a $20 million grant it received from CPRIT. We have devoted substantially all of our efforts to research and development, including clinical studies, but have not completed development of any product candidate, and our Phase 3 clinical trial of somavaratan failed to meet its primary endpoint. We anticipate that our expenses will increase to the extent we:

- continue the research and development of our only product candidate, AVB-500, and any future product candidates;
- conduct additional clinical studies of AVB-500 in the future;
- seek to discover or in-license additional product candidates;
- seek regulatory approvals for AVB-500 and any future product candidates that successfully complete clinical studies;
- establish a sales, marketing and distribution infrastructure and scale-up manufacturing capabilities to commercialize AVB-500 or other future product candidates if they obtain regulatory approval, including process improvements in order to manufacture AVB-500 at commercial scale; and
- enhance operational, financial and information management systems and hire more personnel, including personnel to support development of AVB-500 and any future product candidates and, if a product candidate is approved, our commercialization efforts.

To be profitable in the future, we must succeed in developing and eventually commercializing AVB-500 as well as other products with significant market potential. This will require us to be successful in a range of activities, including advancing AVB-500 and any future product candidates, completing clinical studies of these product candidates, obtaining regulatory approval for these product candidates and manufacturing, marketing and selling those products for which we may obtain regulatory approval. We may not succeed in these activities and may never generate revenue that is sufficient to be profitable in the future. Even if we are profitable, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to achieve sustained profitability would depress the value of our company and could impair our ability to raise capital, expand our business, diversify our product candidates, market our product candidates, if approved, or continue our operations.

To date, our only completed clinical trial with AVB-500 has been our completed Phase 1 clinical trial with 42 dosed subjects. We expect our research and development expenses to increase significantly as our product candidates advance in clinical development. Because of numerous risks and uncertainties involved in our business, the timing or amount of increased development expenses cannot be accurately predicted and, our expenses could increase beyond expectations if we are required by the FDA, or comparable non-U.S. regulatory authorities, to perform studies or clinical trials in addition to those we currently anticipate. Even if our product candidate is approved for commercial sale, we anticipate incurring significant costs associated with the commercial launch of and the related commercial-scale manufacturing requirements for our product candidate. As a result, we expect to continue to incur significant and increasing operating losses and negative cash flows for the foreseeable future. Because of the numerous risks and uncertainties associated with biopharmaceutical product development and commercialization, we are unable to accurately predict the timing or amount of future expenses or when, or if, we will be able to achieve or maintain profitability. These losses have had and will continue to have an adverse effect on our financial position and working capital.

We will need additional funds to support our operations, and such funding may not be available to us on acceptable terms, or at all, which would force us to delay, reduce or suspend our research and development programs and other operations or commercialization efforts. Raising additional capital may subject us to unfavorable terms, cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our product candidates and technologies.

The completion of the development and the potential commercialization of AVB-500 and any future product candidates, should they receive approval, will require substantial funds. As of December 31, 2019, we had approximately $65.1 million in cash and cash equivalents. We believe that our existing cash and cash equivalents, will be sufficient to sustain operations for at least the next 12 months based on our existing business plan; however, our existing cash and cash equivalents will not be sufficient to enable us to complete the clinical development and commercialization of AVB-500. Our future financing requirements will depend on many factors, some of which are beyond our control, including the following:

- the rate of progress and cost of our future clinical studies;
- the timing of, and costs involved in, seeking and obtaining approvals from the FDA and other regulatory authorities;
- the cost of preparing to manufacture AVB-500 on a larger scale, should we elect to do so;

- the costs of commercialization activities if AVB-500 or any future product candidate is approved, including product sales, marketing, manufacturing and distribution;
- the degree and rate of market acceptance of any products launched by us or future partners;
- the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- our ability to enter into additional collaboration, licensing, commercialization or other arrangements and the terms and timing of such arrangements;
- the emergence of competing technologies or other adverse market developments; and
- the costs of attracting, hiring and retaining qualified personnel.

We do not have any material committed external source of funds or other support for our development efforts. Until we can generate a sufficient amount of product revenue to finance our cash requirements, which we may never do, we expect to finance future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements. Additional financing may not be available to us when we need it or it may not be available on favorable terms. In addition, certain SEC and Nasdaq limitations with respect to fundraising may make it more difficult to raise additional funds. If we raise additional capital through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish certain valuable rights to AVB-500 or potential future product candidates, technologies, future revenue streams or research programs, or grant licenses on terms that may not be favorable to us. If we raise additional capital through public or private equity offerings, the ownership interest of our existing stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. If we raise additional capital through debt financing, we may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we are unable to obtain adequate financing when needed, we may have to delay, reduce the scope of, or suspend one or more of our clinical studies or research and development programs or our commercialization efforts.

Raising additional funds by issuing securities may cause dilution to existing stockholders, and raising funds through lending and licensing arrangements may restrict our operations or require it to relinquish proprietary rights.

We expect that significant additional capital will be needed in the future to continue our planned operations and commercialize AVB-500. Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, strategic alliances and license and development agreements in connection with any collaborations. We do not currently have any committed external source of funds. To the extent that we raise additional capital by issuing equity securities, existing stockholders' ownership may experience substantial dilution, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, declaring dividends, creating liens, redeeming its stock or making investments.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, or through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties on acceptable terms, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise develop and market.

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or our guidance.

Our quarterly and annual operating results may fluctuate significantly in the future, which makes it difficult for us to predict our future operating results. From time to time, we may enter into collaboration agreements with other companies that include development funding and significant upfront and milestone payments and/or royalties, which may become an important source of our revenue. Accordingly, our revenue may depend on development funding and the achievement of development and clinical milestones under any potential future collaboration and license agreements and sales of our products, if approved. These upfront and milestone payments may vary significantly from period to period and any such variance could cause a significant fluctuation in our operating results from one period to the next. In addition, our manufacturing and clinical trial expenses, which are anticipated to be significant, may fluctuate significantly quarter to quarter based upon whether or not we are engaged in clinical trials or manufacturing our product candidate, and timing of our process development work. Furthermore, we measure compensation cost for stock-based awards made to employees at the grant date of the award, based on the fair value of the award as determined by our board of directors, and recognize the cost as an expense over the employee's requisite service period. As the variables that we use as a basis for valuing these awards change over time, our underlying stock price and stock price volatility, the magnitude of the expense that we must recognize may vary significantly. Furthermore, our operating results may fluctuate due to a variety of other factors, many of which are outside of our control and may be difficult to predict, including the following:

- the timing and cost of, and level of investment in, research and development activities relating to AVB-500 and any future product candidates, which will change from time to time;
- our ability to enroll patients in clinical trials and the timing of enrollment;
- the cost of manufacturing AVB-500 and any future product candidates, which may vary depending on FDA guidelines and requirements, the quantity of production and the terms of our agreements with manufacturers;
- expenditures that we will or may incur to acquire or develop additional product candidates and technologies;
- the timing and outcomes of clinical studies for AVB-500 and any future product candidates or competing product candidates;
- changes in the competitive landscape of our industry, including consolidation among our competitors or partners;
- any delays in regulatory review or approval of AVB-500 or any of our future product candidates;
- the level of demand for AVB-500 and any future product candidates, should they receive approval, which may fluctuate significantly and be difficult to predict;
- the risk/benefit profile, cost and reimbursement policies with respect to our products candidates, if approved, and existing and potential future drugs that compete with our product candidates;
- competition from existing and potential future drugs that compete with AVB-500 or any of our future product candidates;
- our ability to commercialize AVB-500 or any future product candidate inside and outside of the United States, either independently or working with third parties;
- our ability to establish and maintain collaborations, licensing or other arrangements;
- our ability to adequately support future growth;
- potential unforeseen business disruptions that increase our costs or expenses;
- future accounting pronouncements or changes in our accounting policies; and
- the changing and volatile global economic environment.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue and/or earnings guidance we may provide.

Because of the Merger and other factors, our pre-merger U.S. net operating loss carryforwards and certain other tax attributes will be subject to limitations.

At December 31, 2019, we had net operating loss carryforwards for federal income tax purposes of approximately $27.9 million, of which $23.1 million was generated post December 31, 2017 (after section 382 limitation) and will have no expiration date. The remaining $4.8 million of net operating loss carryforwards begin to expire in 2037. The Company also has Federal research and development tax credits of approximately $90 thousand which begin to expire in 2037.

At December 31, 2019, our total gross deferred tax assets were $13.2 million. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance. The deferred tax assets were primarily comprised of federal and state tax net operating losses and tax credit carryforwards. Utilization of net operating losses and tax credit carryforwards may be limited by the "ownership change" rules, as defined in Section 382 of the Internal Revenue Code (any such limitation, a "Section 382 limitation"). Similar rules may apply under state tax laws. We have performed an analysis to determine whether an "ownership change" occurred from inception up to the Private Aravive's acquisition date. Based on this analysis during 2018, management determined that both Versartis, Inc. and Private Aravive did experience ownership changes, which resulted in a significant impairment of the net operating losses and credit carryforwards. In 2019, no additional significant ownership changes were noted. Future changes in our stock ownership, some of which are outside of our control, could result in a further ownership change under Section 382 of the Code. Furthermore, our ability to utilize net operating losses of Private Aravive or other companies that we may acquire in the future may be subject to limitations. For these reasons, we may not be able to utilize a material portion of the net operating losses, even if we were to achieve profitability.

The TCJA changed certain of the rules governing net operating loss carryforwards. For net operating losses arising in tax years beginning after December 31, 2017, the TCJA limits a taxpayer's ability to utilize net operating loss carryforwards to 80% of taxable income. In addition, net operating losses arising in tax years ending after December 31, 2017 can be carried forward indefinitely, but carryback is generally prohibited. Net operating losses generated in tax years beginning before January 1, 2018 will not be subject to the taxable income limitation, and net operating losses generated in tax years ending before January 1, 2018 will continue to have a two-year carryback and 20-year carryforward period. Deferred tax assets for net operating losses will need to be measured at the applicable tax rate in effect when the net operating loss is expected to be utilized. The changes in the carryforward/carryback periods as well as the new limitation on use of net operating losses may significantly impact the merged company's valuation allowance assessments for net operating losses generated after December 31, 2017.

Risks Related To Our Business

Global health crises may adversely affect our planned operations.

Our business and the business of the supplier of our clinical product candidate and the suppliers of the standard of care drugs that are administered in combination with our clinical product candidate could be materially and adversely affected by the risks, or the public perception of the risks, related to a pandemic or other health crisis, such as the recent outbreak of novel coronavirus (COVID-19). A significant outbreak of contagious diseases in the human population could result in a widespread health crisis that could adversely affect our planned operations. Such events could result in the complete or partial closure of one or more manufacturing facilities which could impact our supply of our clinical product candidate or the standard of care drugs that are administered in combination with our clinical product candidate. In addition, an outbreak near our clinical trial sites are located would likely impact our ability to recruit patients, delay our clinical trials, and could affect our ability to complete our clinical trials within the planned time periods. In addition, it could impact economies and financial markets, resulting in an economic downturn that could impact our ability to raise capital or slow down potential partnering relationships.

Coronavirus could adversely impact our business, including our clinical trials.

In December 2019, a novel strain of coronavirus, COVID-19, was reported to have surfaced in Wuhan, China. Since then, the COVID-19 coronavirus has spread to multiple countries, including the United States and European and Asia-Pacific countries, including countries in which we have planned or active clinical trial sites. As the COVID-19 coronavirus continues to spread around the globe, we will likely experience disruptions that could severely impact our business and clinical trials, including:

- delays or difficulties in enrolling patients in our clinical trials;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators and clinical site staff;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- interruption of key clinical trial activities, such as clinical trial site monitoring, due to limitations on travel imposed or recommended by federal or state governments, employers and others;
- limitations in employee resources that would otherwise be focused on the conduct of our clinical trials, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people;

- delays in receiving approval from local regulatory authorities to initiate our planned clinical trials;
- delays in clinical sites receiving the supplies and materials needed to conduct our clinical trials;
- interruption in global shipping that may affect the transport of clinical trial materials, such as investigational drug product used in our clinical trials;
- changes in local regulations as part of a response to the COVID-19 coronavirus outbreak which may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or to discontinue the clinical trials altogether;
- delays in necessary interactions with local regulators, ethics committees and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees;
- delay in the timing of interactions with the FDA due to absenteeism by federal employees or by the diversion of their efforts and attention to approval of other therapeutics or other activities related to COVID-19; and
- refusal of the FDA to accept data from clinical trials in affected geographies outside the United States.

In addition, the outbreak of the coronavirus ("COVID-19") could disrupt our operations due to absenteeism by infected or ill members of management or other employees, or absenteeism by members of management and other employees who elect not to come to work due to the illness affecting others in our office or laboratory facilities, or due to quarantines. COVID-19 illness could also impact members of our Board of Directors resulting in absenteeism from meetings of the directors or committees of directors, and making it more difficult to convene the quorums of the full Board of Directors or its committees needed to conduct meetings for the management of our affairs.

The global outbreak of the COVID-19 coronavirus continues to rapidly evolve. The extent to which the COVID-19 coronavirus may impact our business and clinical trials will depend on future developments, which are highly uncertain and cannot be predicted with confidence, such as the ultimate geographic spread of the disease, the duration of the outbreak, travel restrictions and social distancing in the United States and other countries, business closures or business disruptions and the effectiveness of actions taken in the United States and other countries to contain and treat the disease.

Reliance on government funding for our programs may impose requirements that limit our ability to take certain actions, and subject us to potential financial penalties, which could materially and adversely affect our business, financial condition and results of operations.

A significant portion of our funding has been through a grant Private Aravive received from CPRIT. The CPRIT Grant (as described below) includes provisions that reflect the government's substantial rights and remedies, many of which are not typically found in commercial contracts, including powers of the government to potentially require repayment of all or a portion of the grant award proceeds, in certain cases with interest, in the event we violate certain covenants pertaining to various matters that include any potential relocation outside of the State of Texas. Although our contract with CPRIT terminated November 30, 2019, our royalty and other obligations, including our obligation to repay the disbursed grant proceeds under certain circumstances, to maintain certain records and documentation, to notify CPRIT of certain unexpected adverse events and our obligation to use reasonable efforts to ensure that any new or expanded preclinical testing, clinical trials, commercialization or manufacturing related to any aspect to our CPRIT project take place in Texas, survive the termination of the agreement. In addition, if we relocate our principal place of business outside of Texas within the three year period after the date of final payment of grant funds (which final payment has not yet occurred), we are required to repay to CPRIT all grant funds received. We have received $18.4 million of the grant proceeds and expect to expend all of the grant award proceeds by the agreement termination date. We have recorded a CPRIT receivable balance of $1.6 million as of December 31, 2019 in other current assets for the remaining grant award for reimbursement of eligible expenses.

Our award from CPRIT requires us to pay CPRIT a portion of our revenues from sales of certain products by us, or received from our licensees or sublicensees, at tiered percentages of revenue in the low- to mid-single digits until the aggregate amount of such payments equals 400% of the grant award proceeds, and thereafter at a rate of less than one percent for as long as we maintain government exclusivity, subject to our right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to terminate such payment obligations. In addition, the grant contract also contains a provision that provides for repayment to CPRIT of some amount not to exceed the full amount of the grant proceeds under certain specified circumstances involving relocation of our principal place of business outside Texas.

In order to meet the requirements that any new or expanded preclinical testing, clinical trials, commercialization or manufacturing related to any aspect of our CPRIT project take place in Texas, we will need to hire additional qualified personnel and vendors with expertise in preclinical testing, clinical research and testing, government regulation, formulation and manufacturing, sales and marketing and accounting and financing located in Texas. We will compete for qualified individuals, vendors, clinical trial sites, manufacturers with numerous biopharmaceutical companies, universities and other research institutions. Competition for such individuals is intense, and there can be no assurance that the search for such personnel will be successful, especially in light of the territorial restrictions imposed by CPRIT.

If we fail to maintain compliance with any such requirements that may apply to us now or in the future, we may be subject to potential liability and to termination of our contracts, including potentially the CPRIT Grant, which could result in significant expense to us.

We rely on licenses to use various technologies that are material to our business and if the agreements underlying the licenses were to be terminated or if other rights that may be necessary for commercializing our intended products cannot be obtained, it would halt our ability to market our products and technology, as well as have an immediate material adverse effect on our business, operating results and financial condition.

Our prospects are significantly dependent upon our license with Stanford University, or the Stanford License. The Stanford License grants us exclusive, worldwide rights to certain existing patents and related intellectual property that cover AVB-500, the lead development candidate selected from the AVB-S6 family of proteins. If we breach the terms of the Stanford License, including any failure to make minimum royalty payments required thereunder or failure to reach certain developmental milestones and by certain deadlines or other factors, including but not limited to, the failure to comply with material terms of the Stanford License, the licensor has the right to terminate the license. If we were to lose or otherwise be unable to maintain the license on acceptable terms, or find that it is necessary or appropriate to secure new licenses from other third parties, we would not be able to market our products and technology, which would likely require us to cease our current operations which would have an immediate material adverse effect on our business, operating results and financial condition.

If we fail to comply with our obligations in our intellectual property licenses with third parties, we could lose license rights that are important to our business.

In addition to the Stanford License, we are a party to intellectual property license agreements with third parties, and we expect to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that our future license agreements will impose, various diligence, milestone payment, royalty, insurance and other obligations on us. If we fail to comply with these obligations, our licensors may have the right to terminate these agreements, in which event we may not be able to develop and market any product that is covered by these agreements. The occurrence of such events could materially harm our business and financial condition.

The risks described elsewhere pertaining to our intellectual property rights also apply to the intellectual property rights that we license, and any failure by us or our licensors to obtain, maintain, defend and enforce these rights could have a material adverse effect on our business. In some cases we do not have control over the prosecution, maintenance or enforcement of the patents that we license, and may not have sufficient ability to provide input into the patent prosecution, maintenance and defense process with respect to such patents, and our licensors may fail to take the steps that we believe are necessary or desirable in order to obtain, maintain, defend and enforce the licensed patents. We are responsible for preparing, filing, and prosecuting broad patent claims (including any interference or reexamination actions) for Stanford University's benefit and for maintaining all licensed patents.

We rely extensively on our information technology systems and are vulnerable to damage and interruption.

We rely on our information technology systems and infrastructure to process transactions, summarize results and manage our business, including maintaining client and supplier information. Additionally, we utilize third parties, including cloud providers, to store, transfer and process data. Our information technology systems, as well as the systems of our suppliers and other partners, whose systems we do not control, are vulnerable to outages and an increasing risk of continually evolving deliberate intrusions to gain access to company sensitive information. Likewise, data security incidents and breaches by employees and others with or without permitted access to our systems pose a risk that sensitive data may be exposed to unauthorized persons or to the public. A cyber-attack or other significant disruption involving our information technology systems, or those of our vendors, suppliers and other partners, could also result in disruptions in critical systems, corruption or loss of data and theft of data, funds or intellectual property. We may be unable to prevent outages or security breaches in our systems. We remain potentially vulnerable to additional known or yet unknown threats as, in some instances, we, our suppliers and our other partners may be unaware of an incident or its magnitude and effects. We also face the risk that we expose our vendors or partners to cybersecurity attacks. Any or all of the foregoing could adversely affect our results of operations and our business reputation.

Any failure to maintain the security of information relating to our customers, employees and suppliers, whether as a result of cybersecurity attacks or otherwise, could expose us to litigation, government enforcement actions and costly response measures, and could disrupt our operations and harm our reputation.

In connection with the sales and marketing of our products and services, we may from time to time transmit confidential information. We also have access to, collect or maintain private or confidential information regarding our clinical trials and the patients enrolled therein, employees, and suppliers, as well as our business. Cyberattacks are rapidly evolving and becoming increasingly sophisticated. It is possible that computer hackers and others might compromise our security measures, or security measures of those parties that we do business with now or in the future, and obtain the personal information of patients in our clinical trials, vendors, employees and suppliers or our business information. A security breach of any kind, including physical or electronic break-ins, computer viruses and attacks by hackers, employees or others, could expose us to risks of data loss, litigation, government enforcement actions, regulatory penalties and costly response measures, and could seriously disrupt our operations. Any resulting negative publicity could significantly harm our reputation, which could cause us to lose market share and have an adverse effect on our results of operations.

We currently have only one product candidate in clinical development and are dependent on the success of this product candidate, which requires significant additional clinical testing before seeking regulatory approval. If our clinical product candidate does not receive regulatory approval or is not successfully commercialized, our business may be harmed.

We are currently developing one clinical product candidate, AVB-500, as a potential treatment for several types of cancer and fibrosis. AVB-500 is currently being tested in clinical trials, and, to date, we have not had any product candidate approved for commercial sale. It is possible that we may never be able to develop a marketable product candidate. Our main focus is the development of AVB-500, for which we completed a Phase 1 clinical trial, commenced the Phase 1b portion of our planned Phase 1b/2 clinical trial for the treatment of platinum-resistant recurrent ovarian cancer.

We may need to engage in further dose-finding studies for AVB-500. In our Phase 1 clinical trial of AVB-500, single doses ranging from 1 mg per kg to 10 mg per kg were evaluated and repeat doses of 5 mg per kg per week (for a total of 4 doses) were evaluated. Based upon the results of our Phase 1 clinical trial, in the Phase 1b portion of our Phase 1b/2 clinical trial we initially used a 10mg per kg dose for all patients receiving AVB-500; which was increased to 15mg per kg and then to 20 mg per kg based on our exposure response analysis from the initial 31 patients in the Phase 1b clinical trial. However, our hypothesis on dose response may be incorrect and we may discover that 20mg per kg is not an adequate dose. In order for AVB-500 to successfully complete development, we may need to continue to refine its dosage, which, as occurred when we increased the dose from 10 mg per kg to 20 mg per kg, will increase our costs and slow down our product candidate development and approval process.

We expect that a substantial portion of our efforts and expenditures over the next few years will be devoted to AVB-500. Accordingly, our business currently depends heavily on the successful development, regulatory approval and commercialization of AVB-500, which may not receive regulatory approval or be successfully commercialized even if regulatory approval is received. The research, testing, manufacturing, labeling, approval, sale, marketing and distribution of product candidates are and will remain subject to extensive regulation by the FDA and other regulatory authorities in the United States and other countries that each have differing regulations. We are not permitted to market any product in the United States unless and until we receive approval of a BLA, from the FDA, or in any foreign countries unless and until we receive the requisite approval from regulatory authorities in such countries. We have never submitted a BLA to the FDA or comparable applications to other regulatory authorities and do not expect to be in a position to do so for the foreseeable future. Obtaining approval of a BLA is an extensive, lengthy, expensive and inherently uncertain process, and the FDA may delay, limit or deny approval of its product for many reasons.

Our success depends largely upon our ability to advance our clinical product candidate, which is in early stages of development, through the various stages of drug development. If we are unable to successfully advance or develop our clinical product candidate, our business will be materially harmed.

Our clinical product candidate is in early stages of clinical development, and its commercial viability remains subject to the successful outcome of future preclinical studies, clinical trials, manufacturing processes, regulatory approvals and the risks generally inherent in the development of pharmaceutical product candidates. Failure to advance the development of our clinical product candidate may have a material adverse effect on our business. The long-term success of our business ultimately depends upon our ability to advance the development of our product candidate through clinical trials, appropriately formulate and consistently manufacture it in accordance with strict specifications and regulations, obtain approval for sale by the FDA or similar regulatory authorities in other countries, and ultimately successfully commercialize it directly or with a strategic partner or licensee. We cannot assure investors that the results of our ongoing or future research, preclinical studies or clinical trials will support or justify the continued development of our clinical product candidate or that we will ultimately receive approval from the FDA, or similar regulatory authorities in other countries, to advance the development of AVB-500.

AVB-500 must satisfy rigorous regulatory standards of safety, efficacy and manufacturing before we can advance or complete its development and before it can be approved for sale by the FDA or similar regulatory authorities in other countries. To satisfy these standards, we must engage in expensive and lengthy studies and clinical trials, develop acceptable and cost effective manufacturing processes, and obtain regulatory approval of our clinical product candidate. Despite these efforts, our clinical product candidate may not:

- demonstrate clinically meaningful therapeutic or other medical benefits as compared to a patient receiving no treatment or over existing drugs or other product candidates in development to treat the same patient population;
- be shown to be safe and effective in future preclinical studies or clinical trials;
- have the desired therapeutic or medical effects;
- be tolerable or free from undesirable or unexpected side effects;
- meet applicable regulatory standards;
- be capable of being appropriately formulated and manufactured in commercially suitable quantities or scale and at an acceptable cost; or
- be successfully commercialized by us or our licensees or collaborators.

Even if we demonstrate favorable results in preclinical studies and early-stage clinical trials, we cannot assure you that the results of late-stage clinical trials will be sufficient to support the continued development of our clinical product candidate. Many, if not most, companies in the pharmaceutical and biopharmaceutical industries have experienced significant delays, setbacks and failures in all stages of development, including late-stage clinical trials, even after achieving promising results in preclinical testing or early-stage clinical trials. Accordingly, results from completed preclinical studies and early-stage clinical trials of our clinical product candidate may not be predictive of the results we may obtain in future late-stage trials. Furthermore, even if the data collected from preclinical studies and clinical trials involving any of our clinical product candidate demonstrate a satisfactory safety, tolerability and efficacy profile, such results may not be sufficient to obtain regulatory approval from the FDA in the United States, or other similar regulatory agencies in other jurisdictions, which is required to market and sell the product.

Clinical trials are risky, lengthy and expensive. We incur substantial expense for, and devote significant time and resources to, preclinical testing and clinical trials, yet cannot be certain that these tests and trials will demonstrate that a product candidate is effective and well-tolerated, or will ever support its approval and commercial sale. For example, clinical trials require adequate supplies of clinical trial material and sufficient patient enrollment to power the trial. Delays in patient enrollment can result in increased costs and longer development times. Even if we, or a licensee or collaborator, if applicable, successfully complete clinical trials for our clinical product candidate, we or they might not file the required regulatory submissions in a timely manner and may not receive marketing approval for the clinical product candidate. We cannot assure you that our clinical product candidate will successfully progress further through the drug development process, or ultimately will result in an approved and commercially viable product.

We have limited experience conducting clinical trials.

We are an early stage clinical stage company, and our success is dependent upon our ability to obtain regulatory approval for and commercialization of our clinical product candidate, and we have not demonstrated an ability to perform the functions necessary for the approval or successful commercialization of any product candidate. The successful commercialization of any product candidate may require us to perform a variety of functions, including:

- continuing to undertake preclinical development and successfully enroll subjects in clinical trials;
- participating in regulatory approval processes;
- formulating and manufacturing products; and
- conducting sales and marketing activities.

We have limited experience conducting and enrolling subjects in clinical trials. While certain members of our management and staff have significant experience in conducting clinical trials, to date, we have only limited experience conducting clinical trials since the Merger. In part because of this lack of experience, we cannot guarantee that planned clinical trials will be completed on time, if at all. Large-scale trials require significant additional financial and management resources, monitoring and oversight, and reliance on third-party clinical investigators, consultants or contract research organizations, or CROs. Relying on third-party clinical investigators, CROs and manufacturers, which are all also subject to governmental oversight and regulations, may also cause us to encounter delays that are outside of our control.

If the actual or perceived therapeutic benefits, or the safety or tolerability profile of our clinical product candidate is not equal to or superior to other competing treatments approved for sale or in clinical development, we may terminate the development of our clinical product candidate at any time, and our business prospects and potential profitability could be harmed.

We are aware of a number of companies marketing or developing product candidates for the treatment of patients with cancer and fibrosis that are either approved for sale or further advanced in clinical development than ours, such that their time to approval and commercialization may be shorter than that for AVB-500.

There are currently FDA approved biological drugs that target the GAS6/AXL pathway. However, if ever approved as a treatment for cancer, AVB-500 would indirectly compete with drugs approved to treat various types of cancer, such as those that regulate T-cell proliferation, including nivolumab, pembrolizumab, atezolizumab and other small molecule chemically manufactured drugs that target this pathway or other classes of drugs that are used for the clinical indications that ours is currently pursuing in clinic.

If at any time we believe that AVB-500 may not provide meaningful or differentiated therapeutic benefits, perceived or real, equal to or better than its competitor's products or product candidates, or we believe that it may not have as favorable a safety or tolerability profile as potentially competitive compounds, we may delay or terminate its development. We cannot provide any assurance that the future development of AVB-500 will demonstrate any meaningful therapeutic benefits over potentially competitive compounds currently approved for sale or in development, or an acceptable safety or tolerability profile sufficient to justify its continued development.

For the Phase 1b portion of our Phase 1b/2 clinical trial in patients with platinum-resistant recurrent ovarian cancer and for the Phase 1b clinical trial testing in patients with clear cell renal carcinoma , we are administering, or plan to administer, our clinical product candidate in combination with other approved standard of care drugs. Any problems obtaining the standard of care drugs could result in a delay or interruption in our clinical trials.

For the Phase 1b portion of our Phase 1b/2 clinical trial of AVB-500 for the treatment of patients with platinum-resistant recurrent ovarian cancer, we are administering our clinical product candidate in combination with already approved standard of care drugs. For the Phase 1b portion of our Phase 1b/2 clinical trial of AVB-500 for the treatment of patients with clear cell renal carcinoma, our clinical trial we intend to administer our clinical product candidate in combination with an already approved standard of care drug. Therefore, our success will be dependent upon the continued use of these other standard of care drugs. We expect that in any other clinical trials we conduct for additional indications, our clinical product candidate will also be administered in combination with drugs owned by third parties. If any of the standard of care drugs that are used in our clinical trials are unavailable while the trials are continuing, the timeliness and commercialization costs could be impacted. In addition, if any of these other drugs are determined to have safety or efficacy problems, our clinical trials and commercialization efforts would be adversely affected.

If our product candidate would require or would commercially benefit from a companion diagnostic, and if we are unable to successfully validate, develop and obtain regulatory clearance or approval for such a companion diagnostic test, or experience significant delays in doing so, we may not realize the full commercial potential of our product candidates.

In connection with the clinical development of AVB-500 or other product candidates for certain indications, we may work with collaborators to develop or obtain access to in vitro companion diagnostic tests to identify patient subsets within a disease category who may derive selective and meaningful benefit from our drug candidates. Such companion diagnostics may be used during our clinical trials as well as in connection with the commercialization of our product candidates. To be successful, we or our collaborators will need to address a number of scientific, technical, regulatory and logistical challenges. The FDA and comparable foreign regulatory authorities regulate in vitro companion diagnostics as medical devices and, under that regulatory framework, will likely require the conduct of clinical trials to demonstrate the safety and effectiveness of any diagnostics we may develop, which we expect will require separate regulatory clearance or approval prior to commercialization. We may be unable to successfully validate, develop and obtain regulatory clearance or approval for any such companion diagnostic tests or may experience delays in doing so, which could materially harm or limit the commercial potential of our product candidates.

Our clinical product candidate may exhibit undesirable side effects when used alone or in combination with other approved pharmaceutical products, which may delay or preclude its development or regulatory approval, or limit its use if ever approved.

Throughout the drug development process, we must continually demonstrate the activity, safety and tolerability of our clinical product candidate in order to obtain regulatory approval to further advance our clinical development, or to eventually market it. Even if our clinical product candidate demonstrates adequate biologic activity and clear clinical benefit, any unacceptable side effects or adverse events, when administered alone or in the presence of other pharmaceutical products, may outweigh these potential benefits. We may observe adverse or serious adverse events or drug-drug interactions in preclinical studies or clinical trials of our clinical product candidate, which could result in the delay or termination of its development, prevent regulatory approval, or limit its market acceptance if it is ultimately approved.

For our clinical product candidate, we rely upon one third party to manufacture its drug substance. Any problems experienced by either our third-party manufacturer or our vendors could result in a delay or interruption in the supply of our clinical product candidate to us until the third-party manufacturer or its vendor cures the problem or until we locate and qualify an alternative source of manufacturing and supply.

For our clinical product candidate, we currently rely on one third-party manufacturer located in China to manufacture our clinical product candidate for our clinical studies and that manufacturer purchases materials from our third-party vendors and transports the materials necessary to produce our clinical product candidate, such as the required reagents and containers. The recent outbreak of the novel strain of coronavirus has caused a widespread health crisis in several districts in China resulting in temporary work stoppages in many affected districts. Although our manufacturer's facilities are not located in the affected districts, if the virus should spread to the districts in which our manufacturer's facilities are located, we could experience delays in manufacturing and shipments of our clinical product, which could result in clinical trial delays. If the third-party manufacturer were to experience any prolonged disruption for our manufacturing, we could be forced to seek additional third party manufacturing contracts, thereby increasing our development costs and negatively impacting our timelines and any commercialization costs. If we change manufacturers at any point during the development process or after approval of a product candidate, we will be required to demonstrate comparability between the product manufactured by the old manufacturer and the product manufactured by the new manufacturer. If we are unable to do so we may need to conduct additional clinical trials with product manufactured by the new manufacturer.

If our manufacturer is not able to manufacture sufficient quantities of our clinical product candidate, our development activities would be impaired. In addition, the manufacturing facility where our clinical product candidate is manufactured is subject to ongoing, periodic inspection by the FDA or other comparable regulatory agencies to ensure compliance with current Good Manufacturing Practice, or cGMP. Any failure to follow and document the manufacturer's adherence to such cGMP regulations or other regulatory requirements may lead to significant delays in the availability of clinical bulk drug substance and finished product for clinical trials, which may result in the termination of or a hold on a clinical trial, or may delay or prevent filing or approval of marketing applications for our clinical product candidate. We also may encounter problems with the following:

- achieving adequate or clinical-grade materials that meet FDA or other comparable regulatory agency standards or specifications with consistent and acceptable production yield and costs;
- Our contract manufacturers failing to develop an acceptable formulation to support late-stage clinical trials for, or the commercialization of, our clinical product candidate;
- Our contract manufacturer being unable to increase the scale of or the capacity for, or reformulate the form of our clinical product candidate, which may cause us to experience a shortage in supply, or cause the cost to manufacture our clinical product candidate to increase. We cannot assure you that our contract manufacturers will be able to manufacture our clinical product candidate at a suitable commercial scale, or that we will be able to find alternative manufacturers acceptable to us that can do so;
- Our contract manufacturer placing a priority on the manufacture of other customers' or its own products, rather than our products;
- Our contract manufacturer or our vendors failing to perform as agreed, including failing to properly package, transport or store our clinical product candidate or its reagents, or exiting from the contract manufacturing business;
- Our contract manufacturers' plants being closed as a result of regulatory sanctions or a natural disaster;
- Shortages of qualified personnel, raw materials or key contractors;
- Our contract manufacturers failing to obtain FDA approval for commercial scale manufacturing; and
- Ongoing compliance with cGMP regulations and other requirements of the FDA or other comparable regulatory agencies.

If we encounter any of these problems or are otherwise delayed, or if the cost of manufacturing in the China facility is not economically feasible or we cannot find another third-party manufacturer, we may not be able to produce our clinical product candidate in a sufficient quantity to meet future demand.

In addition, since we rely on a third-party manufacturer located in China, our business is subject to risks associated with doing business in China, including:

- adverse political and economic conditions, particularly those potentially negatively affecting the trade relationship between the United States and China;
- trade protection measures, such as tariff increases, and import and export licensing and control requirements;
- potentially negative consequences from changes in tax laws;
- difficulties associated with the Chinese legal system, including increased costs and uncertainties associated with enforcing contractual obligations in China;

- historically lower protection of intellectual property rights;
- changes and volatility in currency exchange rates;
- unexpected or unfavorable changes in regulatory requirements;
- possible patient or physician preferences for more established pharmaceutical products and medical devices manufactured in the United States; and
- difficulties in managing foreign relationships and operations generally.

These risks are likely to be exacerbated by our limited experience with our current products and manufacturing processes. If demand for our products materializes, we may have to invest additional resources to purchase materials, hire and train employees, and enhance our manufacturing processes. It may not be possible for us to manufacture our clinical product candidate at a cost or in quantities sufficient to make its clinical product candidate commercially viable. Any of these factors may affect our ability to manufacture our products and could reduce gross margins and profitability.

Reliance on third-party manufacturers and suppliers entails risks to which we would not be subject if we manufactured our clinical product candidate itself, including:

- reliance on the third parties for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreements by the third parties because of factors beyond our control or the insolvency of any of these third parties or other financial difficulties, labor unrest, natural disasters or other factors adversely affecting their ability to conduct their business; and
- possibility of termination or non-renewal of the agreements by the third parties, at a time that is costly or inconvenient for us, because of our breach of the manufacturing agreement or based on their own business priorities.

If our contract manufacturer or its suppliers fail to deliver the required commercial quantities of our clinical product candidate required for our clinical trials and, if approved, for commercial sale, on a timely basis and at commercially reasonable prices, and we are unable to find one or more replacement manufacturers or suppliers capable of production at a substantially equivalent cost, in substantially equivalent volumes and quality, and on a timely basis, we would likely be unable to meet demand for our products and would have to delay or terminate our pre-clinical or clinical trials, and we would lose potential revenue. It may also take a significant period of time to establish an alternative source of supply for our clinical product candidate and to have any such new source approved by the FDA or any applicable foreign regulatory authorities. Furthermore, any of the above factors could cause the delay or suspension of initiation or completion of clinical trials, regulatory submissions or required approvals of our clinical product candidate, cause it to incur higher costs and could prevent us from commercializing our clinical product candidate successfully.

We may not be able to manufacture AVB-500 in sufficient quantities for commercialization.

In order to receive FDA approval of our clinical product candidate, we will need to manufacture such clinical product candidate in larger quantities. Our third party manufacturer may not be willing or able to increase successfully the manufacturing capacity for our clinical product candidate in a timely or economic manner, or at all. In the event FDA approval is received, we will need to increase production of our clinical product candidate. Significant scale-up of manufacturing may require additional validation studies, which the FDA must review and approve. If we are unable to successfully increase the manufacturing capacity for our clinical product candidate, the clinical trials as well as the regulatory approval or commercial launch of our clinical product candidate may be delayed or there may be a shortage in supply. Our clinical product candidate requires precise, high quality manufacturing. Failure to achieve and maintain high quality manufacturing, including the incidence of manufacturing errors, could result in patient injury or death, delays or failures in testing or delivery, cost overruns or other problems that could harm our business, financial condition and results of operations.

In the event that we need to change our third-party contract manufacturer, our preclinical studies or our clinical trials, the commercialization of our clinical product candidate could be delayed, adversely affected or terminated, or such a change may result in the need for us to incur significantly higher costs, which could materially harm our business.

Due to various regulatory restrictions in the United States and many other countries, as well as potential capacity constraints on manufacturing that occur from time-to-time in our industry, various steps in the manufacture of our clinical product candidate is solely-sourced from certain contract manufacturers. In accordance with cGMPs, changing manufacturers may require the re-validation of manufacturing processes and procedures, and may require further preclinical studies or clinical trials to show comparability between the materials produced by different manufacturers. Changing our current or future contract manufacturers may be difficult, if not impossible for us, and could be extremely costly if we do make such a change, which could result in our inability to manufacture our clinical product candidate for an extended period of time and a delay in the development of our clinical product candidate. Further, in order to maintain our development timelines in the event of a change in a third-party contract manufacturer, we may incur significantly higher costs to manufacture our clinical product candidate.

If third-party vendors, upon whom we rely to conduct our preclinical studies or clinical trials, do not perform or fail to comply with strict regulations, these studies or trials may be delayed, terminated, or fail, or we could incur significant additional expenses, which could materially harm our business.

We have limited resources dedicated to designing, conducting and managing our preclinical studies and clinical trials. We have historically relied on, and intend to continue to rely on, third parties, including clinical research organizations, or CROs, consultants and principal investigators, to assist us in designing, managing, conducting, monitoring and analyzing the data from our preclinical studies and clinical trials. In addition, institution sponsored clinical trials, such as the one being conducted by M.D. Anderson Cancer that uses AVB-500 in combination AstraZeneca Pharmaceuticals LP's medicinal product Durvalumab, will be conducted by the institution. We rely on these vendors and individuals to perform many facets of the clinical development process on our behalf, including conducting preclinical studies, the recruitment of sites and subjects for participation in our clinical trials, maintenance of good relations with the clinical sites, and ensuring that these sites are conducting our trials in compliance with the trial protocol and applicable regulations. If these third parties fail to perform satisfactorily, or do not adequately fulfill their obligations under the terms of our agreements with them, we may not be able to enter into alternative arrangements without undue delay or additional expenditures, and therefore the preclinical studies and clinical trials of our clinical product candidate may be delayed or prove unsuccessful.

Further, the FDA, the EMA, or similar regulatory authorities in other countries, may inspect some of the clinical sites participating in our clinical trials or our third-party vendors' sites to determine if our clinical trials are being conducted according to good clinical practices, or GCPs, or similar regulations. If we or a regulatory authority determine that our third-party vendors are not in compliance with, or have not conducted our clinical trials according to applicable regulations, we may be forced to exclude certain data from the results of the trial, or delay, repeat or terminate such clinical trials.

We rely on third parties to conduct, supervise and monitor our clinical trials, and if those third parties perform in an unsatisfactory manner, it may harm our business.

We rely on CROs and clinical trial sites to ensure the proper and timely conduct of our clinical trials, and we expect to have limited influence over their actual performance.

We also rely upon CROs to monitor and manage data for our clinical programs, as well as the execution of future nonclinical studies. We expect to control only certain aspects of our CROs' activities. Nevertheless, we will be responsible for ensuring that each of our studies is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards and our reliance on the CROs does not relieve us of our regulatory responsibilities.

We and our CROs will be required to comply with the Good Laboratory Practices and GCPs, which are regulations and guidelines enforced by the FDA and are also required by the Competent Authorities of the Member States of the European Economic Area and comparable foreign regulatory authorities in the form of International Conference on Harmonization of Technical Requirements for Pharmaceuticals for Human Use guidelines for any of our product candidates that are in preclinical and clinical development. The Regulatory authorities enforce GCPs through periodic inspections of trial sponsors, principal investigators and clinical trial sites. If we or our CROs fail to comply with GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. Accordingly, if our CROs fail to comply with these regulations or fail to recruit a sufficient number of subjects, we may be required to repeat clinical trials, which would delay the regulatory approval process.

Our CROs will not be our employees, and we will not control whether or not they devote sufficient time and resources to our future clinical and nonclinical programs. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials, or other drug development activities which could harm our competitive position. We face the risk of potential unauthorized disclosure or misappropriation of our intellectual property by CROs, which may reduce our trade secret protection and allow our potential competitors to access and exploit our proprietary technology. If our CROs do not successfully carry out their contractual duties or obligations, fail to meet expected deadlines, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements or for any other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for, or successfully commercialize any product candidate that we develops. As a result, our financial results and the commercial prospects for any product candidate that it develops would be harmed, its costs could increase, and our ability to generate revenues could be delayed.

If our relationship with these CROs terminate, we may not be able to enter into arrangements with alternative CROs or do so on commercially reasonable terms. Switching or adding additional CROs involves substantial cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we intend to carefully manage our relationships with our CROs, there can be no assurance that it will not encounter challenges or delays in the future or that these delays or challenges will not have an adverse impact on our business, financial condition and prospects.

We may seek to selectively establish collaborations, and, if we are unable to establish them on commercially reasonable terms, it may have to alter our development and commercialization plans.

Our product development programs and the potential commercialization of our clinical product candidate will require substantial additional cash to fund expenses. For some of our product candidates we may decide to collaborate with governmental entities or additional pharmaceutical and biotechnology companies for the development and potential commercialization of our product candidates.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative product candidates for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with our product candidate.

Our future success depends on our ability to retain executive officers and attract, retain and motivate qualified personnel.

We are highly dependent on our executive officers and the other principal members of our management and scientific teams. The employment of our executive officers is at-will and our executive officers may terminate their employment at any time. The loss of the services of any of our senior executive officers could impede the achievement of our research, development and commercialization objectives. We do not maintain "key person" insurance for any executive officer or employee.

Recruiting and retaining qualified scientific, clinical, manufacturing and sales and marketing personnel is also critical to our success. We may not be able to attract and retain these personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. Our industry has experienced an increasing rate of turnover of management and scientific personnel in recent years. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist it in devising our research and development and commercialization strategy. Our consultants and advisors may be employed by third parties and have commitments under consulting or advisory contracts with other entities that may limit their availability to advance our strategic objectives. If any of these advisors or consultants can no longer dedicate a sufficient amount of time to the company, our business may be harmed.

Many of the other pharmaceutical companies that we compete against for qualified personnel and consultants have greater financial and other resources, different risk profiles and a longer history in the industry than we do. They also may provide more diverse opportunities and better chances for career advancement. Some of these characteristics may be more appealing to high-quality candidates and consultants than what it has to offer. If we are unable to continue to attract and retain high-quality personnel and consultants, the rate and success at which we can select and develop our clinical product candidate and our business will be limited.

We will need to expand our organization, and we may experience difficulties in managing this growth, which could disrupt operations.

Our future financial performance, our ability to commercialize our clinical product candidate and our ability to compete effectively will depend, in part, on our ability to effectively manage any future growth. As of December 31, 2019, we had 17 employees. We expect to hire additional employees for our managerial, clinical, scientific and engineering, operational, manufacturing, sales and marketing teams. We may have operational difficulties in connection with identifying, hiring and integrating new personnel, especially in light of the CPRIT Grant requirements, including the requirement that we maintain our headquarters in Texas. Future growth would impose significant additional responsibilities on our management, including the need to identify, recruit, maintain, motivate and integrate additional employees, consultants and contractors. Also, our management may need to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. We may not be able to effectively manage the expansion of our operations, which may result in weaknesses in our infrastructure, give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. Our expected growth could require significant capital expenditures and may divert financial resources from other projects, such as the development of our clinical product candidate. If we are unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and/or grow revenues could be reduced, and we may not be able to implement our business strategy.

Our business and operations would suffer in the event of system failures.

Our computer systems and those of our service providers, including its CROs, are vulnerable to damage from computer viruses, unauthorized access, natural disasters (including hurricanes), terrorism, war and telecommunication and electrical failures. If such an event were to occur and cause interruptions in our or their operations, it could result in a material disruption of our development programs and other aspects of our business. For example, the loss of preclinical or clinical trial data from completed, ongoing or planned trials could result in delays in its regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to data or applications, or inappropriate disclosure of personal, confidential or proprietary information, we could incur liability and the further development of our clinical product candidate could be delayed.

Risks Related to Clinical Development, Regulatory Approval and Commercialization

If the results from preclinical studies or clinical trials of AVB-500 are unfavorable, we could be delayed or precluded from its further development or commercialization, which could materially harm our business.

In order to further advance the development of, and ultimately receive marketing approval to sell AVB-500, we must conduct extensive preclinical studies and clinical trials to demonstrate our safety and efficacy to the satisfaction of the FDA or similar regulatory authorities in other countries, as the case may be. Preclinical studies and clinical trials are expensive, complex, can take many years to complete, and have highly uncertain outcomes. Delays, setbacks, or failures can and do occur at any time, and in any phase of preclinical or clinical testing, and can result from concerns about safety, tolerability, toxicity, a lack of demonstrated biologic activity or improved efficacy over similar products that have been approved for sale or are in more advanced stages of development, poor study or trial design, and issues related to the formulation or manufacturing process of the materials used to conduct the trials. The results of prior preclinical studies or early-stage clinical trials are not predictive of the results we may observe in late-stage clinical trials, especially since the number of subjects in our Phase 1 clinical trial was small and all were healthy volunteers with larger number of subjects and with our drug candidate in combinations with standard of care may have different results. In many cases, product candidates in clinical development may fail to show the desired tolerability, safety and efficacy characteristics, despite having favorably demonstrated such characteristics in preclinical studies or early-stage clinical trials.

In addition, we may experience numerous unforeseen events during, or as a result of, preclinical studies and the clinical trial process, which could delay or impede our ability to advance the development of, receive marketing approval for, or commercialize our clinical product candidate, including, but not limited to:

- communications with the FDA, or similar regulatory authorities in different countries, regarding the scope or design of a trial or trials, or placing the development of a product candidate on clinical hold or delaying the next phase of development until questions or issues are satisfactorily resolved, including performing additional studies to answer their queries;
- regulatory authorities or institutional review boards, or IRBs, not authorizing us to commence or conduct a clinical trial at a prospective trial site;
- enrollment in our clinical trials being delayed, or proceeding at a slower pace than we expected, because we have difficulty recruiting participants or participants drop out of our clinical trials at a higher rate than we anticipated;
- our third-party contractors, upon whom we rely to conduct preclinical studies, clinical trials and the manufacturing of our clinical trial materials, failing to comply with regulatory requirements or meet their contractual obligations to us in a timely manner;
- having to suspend or ultimately terminate a clinical trial if participants are being exposed to unacceptable health or safety risks;
- regulatory authorities or IRBs requiring that we hold, suspend or terminate our preclinical studies and clinical trials for various reasons, including non-compliance with regulatory requirements; and
- the supply or quality of material necessary to conduct our preclinical studies or clinical trials being insufficient, inadequate or unavailable.

Even if the data collected from preclinical studies or clinical trials involving our clinical product candidate demonstrate a satisfactory tolerability, safety and efficacy profile, such results may not be sufficient to support the submission of a BLA to obtain regulatory approval from the FDA in the United States, or other similar regulatory authorities in other foreign jurisdictions, which is required for us to market and sell its clinical product candidate.

Clinical trials are very expensive, time-consuming, difficult to design and implement and involve an uncertain outcome, and if they fail to demonstrate safety and efficacy to the satisfaction of the FDA, or similar regulatory authorities, we will be unable to commercialize its clinical product candidate.

Our clinical product candidate is still in early-stage clinical development and will require extensive additional clinical testing before we are prepared to submit a BLA for regulatory approval for any indication or for any treatment regime. We cannot predict with any certainty if or when we might submit a BLA for regulatory approval for AVB-500, for which we completed a Phase 1 clinical trial in June 2018 and began the Phase 1b portion of a Phase 1b/2 clinical trial for ovarian cancer in December 2018 or whether any such future BLA would be approved by the FDA. Human clinical trials are very expensive and difficult to design and implement, in part because they are subject to rigorous regulatory requirements. For instance, the FDA may not agree with endpoints for any clinical trial we propose, which may delay the commencement of our clinical trials. The clinical trial process is also time-consuming. Furthermore, failure can occur at any stage of the trials, and we could encounter problems that cause us to abandon or repeat clinical trials. A product candidate in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through preclinical studies and initial clinical trials, and the results of our Phase 1 clinical trial of the clinical product candidate as well as the pre-clinical results may not be predictive of the results of our Phase 2 trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, including us with respect to our phase 3 VELOCITY trial, of notwithstanding promising results in earlier trials.

Moreover, preclinical and clinical data are often susceptible to multiple interpretations and analyses. Many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products. Success in preclinical testing and early clinical trials does not ensure that later clinical trials, which involve many more subjects and the results of later clinical trials may not replicate the results of prior clinical trials and preclinical testing.

We may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent our ability to receive marketing approval or commercialize our clinical product candidate, including that:

- regulators or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may have delays in reaching or fail to reach agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites;
- clinical trials of our clinical product candidate may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of subjects required for clinical trials of our clinical product candidate may be larger than we anticipate; enrollment in these clinical trials may be slower than we anticipate, or participants may drop out of these clinical trials at a higher rate than we anticipate;
- Our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- regulators or institutional review boards may require that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of clinical trials of our clinical product candidate may be greater than it anticipates; and
- the supply or quality of our clinical product candidate or other materials necessary to conduct clinical trials of our clinical product candidate may be insufficient or inadequate.

If we are required to conduct additional clinical trials or other testing of our clinical product candidate beyond those that we currently contemplate, if we are unable to successfully complete clinical trials of our clinical product candidate or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we may:

- be delayed in obtaining marketing approval for our clinical product candidate require additional funding not budgeted for;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;

- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings, including boxed warnings;
- be subject to additional post-marketing testing requirements; or
- have the product removed from the market after obtaining marketing approval.

Product development costs will also increase if we experience delays in testing or in receiving marketing approvals. We do not know whether any clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our clinical product candidate, could allow our competitors to bring products to market before we do, and could impair our ability to successfully commercialize our clinical product candidate, any of which may harm our business and results of operations.

Enrollment and retention of subjects in clinical trials is an expensive and time-consuming process and could be made more difficult or rendered impossible by multiple factors outside our control.

We may encounter delays in enrolling, or be unable to enroll, a sufficient number of participants to complete any of our clinical trials. Once enrolled, we may be unable to retain a sufficient number of participants to complete any of our trials. Late-stage clinical trials of our clinical product candidate may require the enrollment and retention of large numbers of subjects. Subject enrollment and retention in clinical trials depends on many factors, including the size of the subject population, the nature of the trial protocol, the existing body of safety and efficacy data with respect to the trial drug, the number and nature of competing treatments and ongoing clinical trials of competing drugs for the same indication, the proximity of subjects to clinical sites and the eligibility criteria for the trial.

Furthermore, any negative results we may report in clinical trials of our clinical product candidate or negative results of similar product candidates may make it difficult or impossible to recruit and retain participants in other clinical trials of that same clinical product candidate. Delays or failures in planned subject enrollment or retention may result in increased costs, program delays or both, which could have a harmful effect on its ability to develop its clinical product candidate, or could render further development impossible. In addition, we expect to rely on CROs and clinical trial sites to ensure proper and timely conduct of our future clinical trials and, while we intend to enter into agreements governing our services, we will be limited in our ability to compel our actual performance in compliance with applicable regulations. Enforcement actions brought against these third parties may cause further delays and expenses related to our clinical development programs.

We face significant competition from other biotechnology and pharmaceutical companies, and our operating results will suffer if we fail to compete effectively.

Development of cancer treatments is highly competitive and subject to rapid and significant technological advancements. In particular, we face competition from various sources, including larger and better funded pharmaceutical, specialty pharmaceutical and biotechnology companies, as well as academic institutions, governmental agencies and public and private research institutions. These competitors are focused on delivering therapeutics for the treatment of various cancers with products that are available and have gained market acceptance as the standard treatment protocol. Further, it is likely that additional drugs or other treatments will become available in the future for the treatment of certain cancers.

Many of our existing or potential competitors have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of products for the treatment of cancer, as well as in obtaining regulatory approvals of those products in the United States and in foreign countries. Our current and potential future competitors also have significantly more experience commercializing drugs that have been approved for marketing. Mergers and acquisitions in the pharmaceutical and biotechnology industries could result in even more resources being concentrated among a small number of our competitors.

Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors may succeed in developing, acquiring or licensing, on an exclusive basis, drugs that are more effective or less costly than any product candidate that we may develop.

We will face competition from other drugs currently approved or that will be approved in the future for the treatment of the other infectious diseases we are currently targeting. Therefore, our ability to compete successfully will depend largely on our ability to:

- develop and commercialize product candidates that are superior to other products in the market;
- demonstrate through our clinical trials that our clinical product candidate is differentiated from existing and future therapies;
- attract qualified scientific and commercial personnel;
- obtain patent or other proprietary protection for its clinical product candidate;

- obtain required regulatory approvals;
- obtain coverage and adequate reimbursement from, and negotiate competitive pricing with, third-party payors; and
- successfully develop and commercialize, independently or with collaborators, new product candidates.

The availability of our competitors' products could limit the demand, and the price we are able to charge, for any product candidate we develop. The inability to compete with existing or subsequently introduced therapies would have an adverse impact on our business, financial condition and prospects.

Established pharmaceutical companies may invest heavily to accelerate discovery and development of novel compounds or to in-license novel compounds that could make our product candidate less competitive. In addition, any new products that competes with an approved product must demonstrate compelling advantages in efficacy, convenience, tolerability and safety in order to overcome price competition and to be commercially successful. Accordingly, our competitors may succeed in obtaining patent protection, discovering, developing, receiving the FDA's approval for or commercializing medicines before we do, which would have an adverse impact on our business and results of operations.

Our clinical product candidate may cause adverse effects or have other properties that could delay or prevent our regulatory approval or limit the scope of any approved label or market acceptance.

Adverse events caused by our clinical product candidate could cause reviewing entities, clinical trial sites or regulatory authorities to interrupt, delay or halt clinical trials and could result in the denial of regulatory approval. If an unacceptable frequency or severity of adverse events are reported in our clinical trials for our clinical product candidate, our ability to obtain regulatory approval for such clinical product candidate may be negatively impacted. In addition, adverse events caused by any clinical product candidate administered in combination with our product candidate could cause similar interruptions and delays, even though not caused by our clinical product candidate.

Furthermore, if any of our products are approved and then cause serious or unexpected side effects, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw their approval of the product candidate or impose restrictions on its distribution or other risk management measures;
- regulatory authorities may require the addition of labeling statements, such as warnings or contraindications;
- we may be required to conduct additional clinical trials;
- we could be sued and held liable for injuries sustained by patients;
- we could elect to discontinue the sale of its product candidate; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the affected product candidate and could substantially increase the costs of commercialization.

Our employees, independent contractors, principal investigators, consultants, commercial collaborators, service providers and other vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could have an adverse effect on our results of operations.

We are exposed to the risk that our employees and contractors, including principal investigators, consultants, commercial collaborators, service providers and other vendors may engage in fraudulent or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or other unauthorized activities that violate the laws and regulations of the FDA and other similar regulatory bodies, including those laws that require the reporting of true, complete and accurate information to such regulatory bodies, manufacturing standards, federal and state healthcare fraud and abuse and health regulatory laws and other similar foreign fraudulent misconduct laws, or laws that require the true, complete and accurate reporting of financial information or data. Misconduct by these parties may also involve the improper use or misrepresentation of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter third party misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting it from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and financial results, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

If we are not able to obtain, or if there are delays in obtaining, required regulatory approvals, we will not be able to commercialize, or will be delayed in commercializing, our clinical product candidate, and our ability to generate revenue will be impaired.

Our clinical product candidate and the activities associated with our development and commercialization, including our design, testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by comparable authorities in other countries. Failure to obtain marketing approval for a clinical product candidate will prevent us from commercializing the clinical product candidate. We have not received approval to market our clinical product candidate from regulatory authorities in any jurisdiction. We only have limited experience in filing and supporting the applications necessary to gain marketing approvals and expect to rely on CROs to assist us in this process. Securing regulatory approval requires the submission of extensive preclinical and clinical data and supporting information to the various regulatory authorities for each therapeutic indication to establish the clinical product candidate's safety and efficacy. Securing regulatory approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the relevant regulatory authority. Our clinical product candidate may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may prevent it from obtaining marketing approval or prevent or limit commercial use.

The process of obtaining marketing approvals, both in the United States and elsewhere, is expensive, may take many years and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidate involved. We cannot assure you that it will ever obtain any marketing approvals in any jurisdiction. The fact that the FDA has designated the investigation of our lead development candidate for platinum-resistant recurrent ovarian cancer as a Fast Track development program, while potentially favorable, provides no assurance as to the timing or outcome of any FDA regulatory process. Fast Track status may be withdrawn if the conditions for such designation are no longer met. Changes in marketing approval policies during the development period, changes in or the enactment of additional statutes or regulations or changes in regulatory review for each submitted product application may cause delays in the approval or rejection of an application. The FDA and comparable authorities in other countries have substantial discretion in the approval process and may refuse to accept any application or may decide that our data is insufficient for approval and require additional preclinical or other studies, and clinical trials. In addition, varying interpretations of the data obtained from preclinical testing and clinical trials could delay, limit or prevent marketing approval of a product candidate. Additionally, any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

Even if we obtain FDA approval in the United States, we may never obtain approval for or commercialize our clinical product candidate in any other jurisdiction, which would limit our ability to realize each product's full market potential.

In order to market our clinical product candidate in a particular jurisdiction, we must establish and comply with numerous and varying regulatory requirements on a country-by-country basis regarding safety and efficacy. Approval by the FDA in the United States does not ensure approval by regulatory authorities in other countries or jurisdictions. In addition, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not guarantee regulatory approval in any other country. Approval processes vary among countries and can involve additional product candidate testing and validation and additional administrative review periods. Seeking foreign regulatory approval could result in difficulties and costs for us and require additional preclinical studies or clinical trials which could be costly and time consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our clinical product candidate in those countries. We do not have any product candidates approved for sale in any jurisdiction, including in international markets, and it does not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, or if regulatory approvals in international markets are delayed, our target market will be reduced and our ability to realize the full market potential of any product candidate we develop will be unrealized.

Even if we obtain regulatory approval, we will still face extensive ongoing regulatory requirements and our clinical product candidate may face future development and regulatory difficulties.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, packaging, distribution, adverse event reporting, storage, recordkeeping, export, import, advertising and promotional activities for such product candidate, among other things, will be subject to extensive and ongoing requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety, efficacy and other post-marketing information and reports, establishment registration and drug listing requirements, continued compliance with current Good Manufacturing Practice, or cGMP, requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping and current GCP requirements for any clinical trials that we conduct post-approval. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the product candidate may be marketed or to the conditions of approval. If our clinical product candidate receives marketing approval, the accompanying label may limit the approved use of our product, which could limit sales.

The FDA may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety and/or efficacy of our clinical product candidate. The FDA closely regulates the post-approval marketing and promotion of drugs to ensure drugs are marketed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and if we do not market our clinical product candidate for its approved indications, we may be subject to enforcement action for off-label marketing. Violations of the Federal Food, Drug, and Cosmetic Act relating to the promotion of prescription drugs may lead to FDA enforcement actions and investigations alleging violations of federal and state health care fraud and abuse laws, as well as state consumer protection laws.

In addition, later discovery of previously unknown adverse events or other problems with our clinical product candidate, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on manufacturing such clinical product candidate;
- restrictions on the labeling or marketing of such clinical product candidate;
- restrictions on product distribution or use;
- requirements to conduct post-marketing studies or clinical trials;
- warning letters;
- withdrawal of the clinical product candidate from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of such clinical product candidate;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;
- refusal to permit the import or export of such clinical product candidate;
- clinical product candidate seizure; or
- injunctions or the imposition of civil or criminal penalties.

The FDA's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our clinical product candidate. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained.

Even if our clinical product candidate receives marketing approval, we may fail to achieve market acceptance by physicians, patients, third-party payors or others in the medical community necessary for commercial success.

If our clinical product candidate receives marketing approval, we may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. If we do not achieve an adequate level of acceptance, we may not generate significant revenues and become profitable. The degree of market acceptance, if approved for commercial sale, will depend on a number of factors, including but not limited to:

- the efficacy and potential advantages compared to alternative treatments;
- effectiveness of sales and marketing efforts;
- the cost of treatment in relation to alternative treatments;
- our ability to offer our clinical product candidate for sale at competitive prices;
- the convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the willingness of the medical community to offer customers our product candidate option in addition to or in the place of our clinical product candidate;
- the strength of marketing and distribution support;
- the availability of third party coverage and adequate reimbursement;
- the prevalence and severity of any side effects; and
- any restrictions on the use of our product together with other medications.

Because we expect sales of our clinical product candidate to be based on the same mechanism of action, the failure of our first product candidate to achieve market acceptance would harm our business and could require us to seek additional financing sooner than we otherwise planned.

The insurance coverage and reimbursement status of newly-approved products is uncertain. Our product candidates may become subject to unfavorable pricing regulations, third-party coverage and reimbursement practices, or healthcare reform initiatives, which would harm our business. Failure to obtain or maintain adequate coverage and reimbursement for new or current products could limit our ability to market those products and decrease our ability to generate revenue.

The regulations that govern marketing approvals, pricing, coverage, and reimbursement for new drugs vary widely from country to country. In the United States, recently enacted legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenue we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if any product candidates we may develop obtain marketing approval.

Our ability to successfully commercialize our product candidates also will depend in part on the extent to which coverage and adequate reimbursement for these products and treatments will be available from government health administration authorities, private health insurers, and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. The availability of coverage and extent of reimbursement by governmental and private payors is essential for most patients to be able to afford treatments such as gene therapy products. Sales of these or other product candidates that we may identify will depend substantially, both domestically and abroad, on the extent to which the costs of our product candidates will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third-party payors. If coverage and adequate reimbursement is not available, or is available only to limited levels, we may not be able to successfully commercialize our product candidates. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish or maintain pricing sufficient to realize a sufficient return on our investment.

The availability and extent of reimbursement by governmental and private payors is essential for most patients to be able to afford expensive treatments. Sales of our clinical product candidate that receive marketing approval will depend substantially, both in the United States and internationally, on the extent to which the costs of our clinical product candidate will be paid by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or reimbursed by government health administration authorities, private health coverage insurers and other third-party payors. If reimbursement is not available, or is available only on a limited basis, we may not be able to successfully commercialize our clinical product candidate. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish or maintain adequate pricing that will allow it to realize a sufficient return on our investment.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe, Canada and other countries may cause us to price our clinical product candidate on less favorable terms that we currently anticipate. In many countries, particularly the countries of the European Union, the prices of medical products are subject to varying price control mechanisms as part of national health systems. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. To obtain reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our clinical product candidate to other available therapies. In general, the prices of products under such systems are substantially lower than in the United States. Other countries allow companies to fix their own prices for products, but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that it is able to charge for its clinical product candidate. Accordingly, in markets outside the United States, the reimbursement for its products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenues and profits.

Moreover, increasing efforts by governmental and third-party payors, in the United States and internationally, to cap or reduce healthcare costs may cause such organizations to limit both coverage and level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for its clinical product candidate. We expect to experience pricing pressures in connection with the sale of our clinical product candidate due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected for new products entering the marketplace.

If we fail to comply with state and federal healthcare regulatory laws, we could face substantial penalties, damages, fines, disgorgement, exclusion from participation in governmental healthcare programs, and the curtailment of its operations, any of which could harm our business.

Although we do not provide healthcare services or submit claims for third party reimbursement, we are subject to healthcare fraud and abuse regulation and enforcement by federal and state governments which could significantly impact our business. The laws that may affect our ability to operate include, but are not limited to:

- the federal anti-kickback statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, receiving, offering, or paying remuneration, directly or indirectly, in cash or in kind, in exchange for or to induce either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service for which payment may be made, in whole or in part, under federal healthcare programs such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of this statute or specific intent to violate it;
- the civil False Claims Act, or FCA, which prohibits, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid or other third-party payors that are false or fraudulent; knowingly making using, or causing to be made or used, a false record or statement to get a false or fraudulent claim paid or approved by the government; or knowingly making, using, or causing to be made or used, a false record or statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the criminal FCA, which imposes criminal fines or imprisonment against individuals or entities who make or present a claim to the government knowing such claim to be false, fictitious or fraudulent;
- HIPAA, which created federal criminal laws that prohibit executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- the federal civil monetary penalties statute, which prohibits, among other things, the offering or giving of remuneration to a Medicare or Medicaid beneficiary that the person knows or should know is likely to influence the beneficiary's selection of a particular supplier of items or services reimbursable by a Federal or state governmental program;
- the federal physician sunshine requirements under the Affordable Care Act, which require certain manufacturers of drugs, devices, biologics, and medical supplies to report annually to the U.S. Department of Health and Human Services information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members; and
- state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws that may apply to items or services reimbursed by any third-party payor, including commercial insurers; state laws that require pharmaceutical companies to comply with the device industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; and state laws that require device manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures.

Further, the Affordable Care Act, among other things, amended the intent requirements of the federal anti-kickback statute and certain criminal statutes governing healthcare fraud. A person or entity can now be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, the Affordable Care Act provided that the government may assert that a claim including items or services resulting from a violation of the federal Anti- Kickback Statute constitutes a false or fraudulent claim for purposes of the FCA. Moreover, while it does not submit claims and its customers make the ultimate decision on how to submit claims, from time to time, we may provide reimbursement guidance to our customers. If a government authority were to conclude that we provide improper advice to our customers or encouraged the submission of false claims for reimbursement, we could face action against us by government authorities. Any violations of these laws, or any action against us for violation of these laws, even if we successfully defend against it, could result in a material adverse effect on our reputation, business, results of operations and financial condition.

We have entered into consulting and scientific advisory board arrangements with physicians and other healthcare providers. Compensation for some of these arrangements includes the provision of stock options. While we have worked to structure our arrangements to comply with applicable laws, because of the complex and far-reaching nature of these laws, regulatory agencies may view these transactions as prohibited arrangements that must be restructured, or discontinued, or for which we could be subject to other significant penalties. We could be adversely affected if regulatory agencies interpret our financial relationships with providers who influence the ordering of and use our products to be in violation of applicable laws.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry.

Responding to investigations can be time- and resource-consuming and can divert management's attention from the business. Additionally, as a result of these investigations, healthcare providers and entities may have to agree to additional onerous compliance and reporting requirements as part of a consent decree or corporate integrity agreement. Any such investigation or settlement could increase our costs or otherwise have an adverse effect on its business.

Product liability lawsuits against us could cause us to incur substantial liabilities and could limit the commercialization of any product candidates we may develop.

We face an inherent risk of product liability exposure related to the testing of our clinical product candidate in human clinical trials and will face an even greater risk if we commercially sell any products that we may develop after approval. Any adverse reactions in our clinical trials could be deemed to be related to our clinical product candidate and could result in claims from these injuries and we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend any related litigation;
- substantial monetary awards to trial subjects or patients;
- loss of revenue; and
- the inability to commercialize any products we may develop.

Although we maintain product liability insurance coverage in the amount of up to $10 million per claim and in the aggregate, we may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage as we continue clinical trials and if we successfully commercialize any products. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

If we are unable to establish sales, marketing and distribution capabilities either on our own or in collaboration with third parties, we may not be successful in commercializing our clinical product candidate, if approved.

We do not have any infrastructure for the sales, marketing or distribution of our clinical product candidate, and the cost of establishing and maintaining such an organization may exceed the cost-effectiveness of doing so. In order to market any product candidate that may be approved, we must build our sales, distribution, marketing, managerial and other non-technical capabilities or make arrangements with third parties to perform these services. To achieve commercial success for any product candidate for which we have obtained marketing approval, we will need a sales and marketing organization. We expect to build a focused sales, distribution and marketing infrastructure to market any other product candidates in the United States, if approved. There are significant expenses and risks involved with establishing our own sales, marketing and distribution capabilities, including our ability to hire, retain and appropriately incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel, and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities could delay any product candidate launch, which would adversely impact commercialization.

Factors that may inhibit our efforts to commercialize our clinical product candidate on our own include:

- Our inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or attain adequate numbers of physicians to administer our products; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

We intend to pursue collaborative arrangements regarding the sale and marketing of our clinical product candidate, if approved, for certain international markets; however, we may not be able to establish or maintain such collaborative arrangements, if able to do so, that our collaborators may not have effective sales. To the extent that we depend on third parties for marketing and distribution, any revenues we receive will depend upon the efforts of such third parties, and there can be no assurance that such efforts will be successful.

If we are unable to build our own sales force in the United States or negotiate a collaborative relationship for the commercialization of our clinical product candidate outside the United States we may be forced to delay the potential commercialization or reduce the scope of our sales or marketing activities. We may have to enter into arrangements with third parties or otherwise at an earlier stage than we would otherwise choose and we may be required to relinquish rights to our intellectual property or otherwise agree to terms unfavorable to us, any of which may have an adverse effect on our business, operating results and prospects.

We may be competing with many companies that currently have extensive and well-funded marketing and sales operations. Without an internal team or the support of a third party to perform marketing and sales functions, we may be unable to compete successfully against these more established companies.

If we obtain approval to commercialize our clinical product candidate outside of the United States, a variety of risks associated with international operations could harm our business.

If our clinical product candidate is approved for commercialization, we intend to enter into agreements with third parties to market them in certain jurisdictions outside the United States. We expect that we will be subject to additional risks related to international operations or entering into international business relationships, including:

- different regulatory requirements for drug approvals and rules governing drug commercialization in foreign countries;
- reduced protection for intellectual property rights;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign reimbursement, pricing and insurance regimes;
- foreign taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- potential noncompliance with the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.K. Bribery Act 2010 and similar anti-bribery and anticorruption laws in other jurisdictions;
- product shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

We have no prior experience in these areas. In addition, there are complex regulatory, tax, labor and other legal requirements imposed by both the European Union and many of the individual countries in Europe with which we will need to comply.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our clinical product candidate and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our clinical product candidate, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidate for which we obtain marketing approval. Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: (i) changes to our manufacturing arrangements, (ii) additions or modifications to product labeling, (iii) the recall or discontinuation of our products or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect our business, financial condition and results of operations.

Among policy makers in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. In March 2010, the Affordable Care Act, or ACA, was passed, which substantially changed the way healthcare is financed by both the government and private insurers, and significantly impacts the U.S. pharmaceutical industry. The ACA, among other things, subjects biological products to potential competition by lower-cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations, establishes annual fees and taxes on manufacturers of certain branded prescription drugs, and creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer’s outpatient drugs to be covered under Medicare Part D.

Some of the provisions of the ACA have yet to be fully implemented, while certain provisions have been subject to judicial and Congressional challenges. Congress has considered legislation that would repeal or repeal and replace all or part of the ACA, and it is unclear how such challenges and other efforts to repeal and replace the Affordable Care Act will impact the Affordable Care Act and our business.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our products. Such reforms could have an adverse effect on anticipated revenue from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop product candidates.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products, which could result in reduced demand for our clinical product candidate or additional pricing pressures. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain patent protection for our clinical product candidate or if the scope of the patent protection obtained is not sufficiently broad, we may not be able to compete effectively in our markets.

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect the intellectual property related to our drug development programs and clinical product candidate. Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our development programs and clinical product candidate. The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates in the United States or in other countries. There is no assurance that all potentially relevant prior art that could invalidate our patents or that could prevent our pending patent applications from issuing as patents have been found. Even if patents do successfully issue, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed, invalidated, or held unenforceable. Any successful challenge to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful commercialization of our product candidates or companion diagnostic that we may develop. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate and companion diagnostic under patent protection could be reduced.

If the patent applications we hold with respect to our platform technology and clinical product candidate fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our clinical product candidate, it could dissuade companies from collaborating with us to develop future product candidates, and threaten our ability to commercialize future drugs. Any such outcome could harm our business.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. For example, European patent law restricts the patentability of methods of treatment of the human body more than U.S. law does. Publications of discoveries in scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or that we were the first to file for patent protection of such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued that protect our technology or product candidates, in whole or in part, or which effectively prevent others from commercializing competitive technologies. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection.

Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of ours issued patents. In 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to United States patent law. These include provisions that affect the way patent applications are prosecuted and may also affect patent litigation. The U.S. Patent Office recently developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, only became effective in 2013. Accordingly, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have an adverse effect on our business and financial condition.

Moreover, we may be subject to a third party pre-issuance submission of prior art to the U.S. Patent and Trademark Office, or USPTO, or become involved in derivation, reexamination, *inter partes* review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. In other countries, we may be subject to or become involved in opposition proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission or proceeding could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or product candidates and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize product candidates without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and its owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and product candidates. Moreover, patents have a limited lifespan. In the United States and other countries, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available; however the life of a patent, and the protection it affords, is limited. Without patent protection for our current or future product candidates, we may be open to competition from generic versions of such product candidates. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, we owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing product candidates similar or identical to ours.

We may be involved in lawsuits to protect or enforce our patents, the patents of our licensors or our other intellectual property rights, which could be expensive, time consuming and unsuccessful.

Competitors and other third parties may infringe or otherwise violate our patents, the patents of our licensors or our other intellectual property rights. To counter infringement or unauthorized use, we may be required to file legal claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours or our licensors is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that such patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated or interpreted narrowly and could put our patent applications at risk of not issuing. The initiation of a claim against a third party may also cause the third party to bring counter claims against us such as claims asserting that our patents are invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, nonenablement or lack of statutory subject matter. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant material information from the USPTO, or made a materially misleading statement, during prosecution. Third parties may also raise similar validity claims before the USPTO in post-grant proceedings such as *inter partes* review, or post-grant review, or oppositions or similar proceedings outside the United States, in parallel with litigation or even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable. We cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. For the patents and patent applications that we have licensed, we may have limited or no right to participate in the defense of any licensed patents against challenge by a third party. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of any future patent protection on our current or future product candidates. Such a loss of patent protection could harm our business.

We may not be able to prevent, alone or with our licensors, misappropriation of our intellectual property rights, particularly in countries where the laws may not protect those rights as fully as in the United States. Our business could be harmed if in litigation the prevailing party does not offer us a license on commercially reasonable terms. Any litigation or other proceedings to enforce our intellectual property rights may fail, and even if successful, may result in substantial costs and distract our management and other employees.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have an adverse effect on the price of our common stock.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our clinical product candidate.

The United States has recently enacted and implemented wide-ranging patent reform legislation. The United States Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on actions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce patents that we have licensed or that we might obtain in the future.

If a third party claims we are infringing on their intellectual property rights, we could incur significant expenses, or be prevented from further developing or commercializing our clinical product candidate, which could materially harm our business.

Our success will also depend on our ability to operate without infringing the patents and other proprietary intellectual property rights of third parties. This is generally referred to as having "freedom to operate." We have not conducted an in-depth freedom to operate search which would be time consuming and costly. The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. The defense and prosecution of intellectual property claims, interference proceedings and related legal and administrative proceedings, both in the United States and internationally, involve complex legal and factual questions. As a result, such proceedings are lengthy, costly and time-consuming, and their outcome is highly uncertain. We may become involved in protracted and expensive litigation in order to determine the enforceability, scope and validity of the proprietary rights of others, or to determine whether we have freedom to operate with respect to the intellectual property rights of others. For example, we are aware of U.S. Patent Nos. 8,168,415 and 8,920,799, which claim AXL fusion proteins and their use in treating cancer. In the event that one of these patents or another patent is successfully asserted against our GAS6-AXL program in the future, we may be unable to market the product, absent a license from the patentee, which may not be available on commercially reasonable terms, if at all.

Patent applications in the United States are, in most cases, maintained in secrecy until approximately 18 months after the patent application is filed. The publication of discoveries in the scientific or patent literature frequently occurs substantially later than the date on which the underlying discoveries were made. Therefore, patent applications relating to product candidates similar to ours may have already been filed by others without our knowledge. In the event that a third party has also filed a patent application covering our clinical product candidate, we may have to participate in an adversarial proceeding, such as an interference proceeding, in the U.S. Patent and Trademark Office, or USPTO, or similar proceedings in other countries, to determine the priority of invention. In the event an infringement claim is brought against us, we may be required to pay substantial legal fees and other expenses to defend such a claim and, if we are unsuccessful in defending the claim, we may be prevented from pursuing the development and commercialization of a product candidate and may be subject to injunctions and/or damage awards.

In the future, the USPTO or a foreign patent office may grant patent rights covering our clinical product candidate to third parties. Subject to the issuance of these future patents, the claims of which will be unknown until issued, we may need to obtain a license or sublicense to these rights in order to have the appropriate freedom to further develop or commercialize them. Any required licenses may not be available to us on acceptable terms, if at all. If we need to obtain such licenses or sublicenses, but is unable to do so, we could encounter delays in the development of our clinical product candidate, or be prevented from developing, manufacturing and commercializing our clinical product candidate at all. If it is determined that we have infringed an issued patent and do not have freedom to operate, we could be subject to injunctions, and/or compelled to pay significant damages, including punitive damages. In cases where we have in-licensed intellectual property, our failure to comply with the terms and conditions of such agreements could harm our business.

It is becoming common for third parties to challenge patent claims on any successfully developed product candidate or approved drug. If we or our licensees or collaborators become involved in any patent litigation, interference or other legal proceedings, we could incur substantial expense, and the efforts and attention of our technical and management personnel could be significantly diverted. A negative outcome of such litigation or proceedings may expose us to the loss of our proprietary position or to significant liabilities, or require us to seek licenses that may not be available from third parties on commercially acceptable terms, if at all. We may be restricted or prevented from developing, manufacturing and selling our clinical product candidate in the event of an adverse determination in a judicial or administrative proceeding, or if we fail to obtain necessary licenses.

We may not be able to protect our intellectual property rights throughout the world, which could impair our business.

Filing, prosecuting and defending patents covering our clinical product candidate throughout the world would be prohibitively expensive. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we may obtain patent protection, but where patent enforcement is not as strong as that in the United States. These other products may compete with our clinical product candidate in jurisdictions where we do not have any issued or licensed patents and any future patent claims or other intellectual property rights may not be effective or sufficient to prevent them from so competing.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

We seek to protect our proprietary technology in part by entering into confidentiality agreements with third parties and, if applicable, material transfer agreements, consulting agreements or other similar agreements with our advisors, employees, third-party contractors and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are inadvertently incorporated into the technology of others, or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have an adverse effect on our business and results of operations.

In addition, these agreements typically restrict the ability of our advisors, employees, third-party contractors and consultants to publish data potentially relating to our trade secrets, although our agreements may contain certain limited publication rights. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submissions, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary fee payments and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. If us and our licensors fail to maintain the patents and patent applications covering our clinical product candidate, our competitive position would be adversely affected.

Intellectual property rights do not necessarily address all potential threats to our competitive advantage.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business or permit us to maintain our competitive advantage. The following examples are illustrative:

- Others may be able to make products that are similar to our product candidates but that are not covered by the claims of the patents that we license;
- Our licensors or collaborators might not have been the first to make the inventions covered by an issued patent or pending patent application;
- Our licensors or collaborators might not have been the first to file patent applications covering an invention;
- Others may independently develop similar or alternative technologies or duplicate any of our or our licensors' technologies without infringing our intellectual property rights;
- Pending patent applications may not lead to issued patents;
- Issued patents may not provide us with any competitive advantages, or may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- Our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- We may not develop or in-license additional proprietary technologies that are patentable; and
- The patents of others may have an adverse effect on our business.

Should any of these events occur, they could significantly harm our business, results of operations and prospects.

We may be subject to claims that our employees have wrongfully used or disclosed alleged trade secrets of their former employers.

Many of our employees, including our senior management, were previously employed at other biotechnology or pharmaceutical companies. These employees typically executed proprietary rights, non-disclosure and non-competition agreements in connection with their previous employers. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these employees have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such employee's former employer. We are not aware of any threatened or pending claims related to these matters, but in the future litigation may be necessary to defend against such claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

Risks Related to the ownership of our common stock

Our stock price has fluctuated in the past, has recently been volatile and may be volatile in the future, and as a result, investors in our common stock could incur substantial losses.

Our stock price has fluctuated in the past, has recently been volatile and may be volatile in the future. From January 1, 2015 through December 31, 2019 the reported sale price of our common stock has fluctuated between $3.07 and $144.00 per share. Following the announcement of the failure of our Phase 3 clinical trial to meet its primary endpoint in September 2017, our stock price declined substantially. In addition, the recent outbreak of the novel strain of coronavirus (COVID-19) has caused broad stock market and industry fluctuations, including a significant decline in our stock price. The stock market in general and the market for biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may experience losses on their investment in our common stock. The market price for our common stock may be influenced by many factors, including the following:

- investor reaction to our business strategy;
- the success of competitive products or technologies;
- results of clinical studies of AVB-500 or future product candidates or those of our competitors;
- regulatory or legal developments in the United States and other countries, especially changes in laws or regulations applicable to our products;
- introductions and announcements of new products by us, results of clinical trials, our commercialization partners, or our competitors, and the timing of these introductions or announcements;
- actions taken by regulatory agencies with respect to our products, clinical studies, manufacturing process or sales and marketing terms;
- variations in our financial results or those of companies that are perceived to be similar to us;
- the success of our efforts to acquire or in-license additional products or product candidates;
- developments concerning our collaborations, including but not limited to those with our sources of manufacturing supply and our commercialization partners;
- developments concerning our ability to bring our manufacturing processes to scale in a cost-effective manner;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- developments or disputes concerning patents or other proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our products;
- our ability or inability to raise additional capital and the terms on which we raise it;
- the recruitment or departure of key personnel;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- declines in the market prices of stocks generally;
- actual or anticipated changes in earnings estimates or changes in stock market analyst recommendations regarding our common stock, other comparable companies or our industry generally;
- trading volume of our common stock;
- sales of our common stock by us or our stockholders;

- general economic, industry and market conditions;
- other events or factors, including those resulting from such events, or the prospect of such events, including war, terrorism and other international conflicts, public health issues including health epidemics or pandemics, such as the recent outbreak of the novel coronavirus (COVID-19), and natural disasters such as fire, hurricanes, earthquakes, tornados or other adverse weather and climate conditions, whether occurring in the United States or elsewhere, could disrupt our operations, disrupt the operations of our suppliers or result in political or economic instability; and
- the other risks described in this “Risk factors” section.

These broad market and industry factors may seriously harm the market price of our common stock, regardless of our operating performance. Since the stock price of our common stock has fluctuated in the past, has been recently volatile and may be volatile in the future, investors in our common stock could incur substantial losses. In the past, following periods of volatility in the market, securities class-action litigation has often been instituted against companies. Such litigation, if instituted against us, could result in substantial costs and diversion of management’s attention and resources, which could materially and adversely affect our business, financial condition, results of operations and growth prospects.

Our executive officers, directors, and entities under our control, and principal stockholders will continue to maintain the ability to control or significantly influence all matters submitted to stockholders for approval.

As of December 31, 2019, our executive officers, directors and entities under our control, and principal stockholders, in the aggregate, owned shares representing approximately 25.9% of our common stock. As a result, if these stockholders were to choose to act together, they would be able to control or significantly influence all matters submitted to our stockholders for approval, as well as our management and affairs. For example, these stockholders, if they choose to act together, will control or significantly influence the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of voting power could delay or prevent an acquisition of our company on terms that other stockholders may desire.

We incur significant costs as a result of operating as a public company, and our management devotes substantial time to new compliance initiatives.

As a public company, we have incurred and will continue to incur significant legal, accounting and other expenses that we did not incur as a private company. We are subject to the reporting requirements of the Securities Exchange Act of 1934, as amended, the other rules and regulations of the Securities and Exchange Commission, or SEC, and the rules and regulations of The Nasdaq Global Select Market, or Nasdaq. Compliance with the various reporting and other requirements applicable to public companies requires considerable time and attention of management. For example, the Sarbanes-Oxley Act and the rules of the SEC and national securities exchanges have imposed various requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls. Our management and other personnel are devoting and will continue to need to devote a substantial amount of time to these compliance initiatives. These rules and regulations will continue to increase our legal and financial compliance costs and will make some activities more time-consuming and costly. The impact of these events could also make it more difficult for us to attract and retain qualified personnel to serve on our board of directors, our board committees, or as executive officers

The Sarbanes-Oxley Act requires, among other things, that we maintain effective internal control over financial reporting and disclosure controls and procedures. In particular, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act. In addition, we will be required to have our independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting beginning with our annual report on Form 10-K following the date on which we are once again an accelerated filer and are no longer an emerging growth company. Our compliance with Section 404 of the Sarbanes-Oxley Act will require that we incur substantial accounting expense and expend significant management efforts. If we are not able to comply with the requirements of Section 404 in a timely manner, or if we or our independent registered public accounting firm identify deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities, which would require additional financial and management resources.

Our ability to successfully implement our business plan and comply with Section 404 requires us to be able to prepare timely and accurate consolidated financial statements. We expect that we will need to continue to improve existing, and implement new operational and financial systems, procedures and controls to manage our business effectively. Any delay in the implementation of, or disruption in the transition to, new or enhanced systems, procedures or controls, may cause our operations to suffer and we may be unable to conclude that our internal control over financial reporting is effective and to obtain an unqualified report on internal controls from our auditors as required under Section 404 of the Sarbanes-Oxley Act. This, in turn, could have an adverse impact on trading prices for our common stock, and could adversely affect our ability to access the capital markets.

For the years ended December 31, 2018 and 2019, we were an "emerging growth company," and availed ourselves of certain the reduced disclosure requirements applicable to emerging growth companies

As of December 31, 2019, we are no longer an emerging growth company under the Jumpstart Our Business Startups Act enacted in April 2012 ("JOBS ACT"). However, for the years ended December 31, 2019 and 2018 we were an emerging growth company. As an emerging growth company and for so long as we continued to be an emerging growth company, we were permitted to and did rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We have chosen to take advantage of some, but not all, of the available exemptions. As a result of these scaled regulatory requirements, our disclosure may be more limited than that of other public companies and investors may not have the same protections afforded to shareholders of such companies. In addition, investors may find our common stock less attractive since we relied on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and the price of our common stock price may be more volatile.

We ceased to be an "emerging growth company," which means we will no longer be able to take advantage of certain reduced disclosure requirements in our public filings.

We ceased to be an "emerging growth company," as defined in the JOBS Act, on December 31, 2019. As a result, we anticipate that costs and compliance initiatives will increase as a result of the fact that we ceased to be an "emerging growth company." In particular, we are now, or will be, subject to certain disclosure requirements that are applicable to other public companies that had not been applicable to us as an emerging growth company. These requirements include:

- compliance with the auditor attestation requirements in the assessment of our internal control over financial reporting once we are an accelerated filer or large accelerated filer;
- compliance with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;
- full disclosure and analysis obligations regarding executive compensation; and
- compliance with regulatory requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

There can be no assurance that we will be able to comply with the applicable regulations in a timely manner, if at all.

An active trading market for our common stock may not be maintained, or we may fail to satisfy applicable Nasdaq listing requirements.

Our common stock is currently traded on Nasdaq, but we can provide no assurance that we will be able to maintain an active trading market for our shares on Nasdaq or any other exchange in the future. The fact that a significant portion of our outstanding shares of common stock is closely held by a few individuals, results in it being more difficult for us to maintain an active trading market. If there is no active market for our common stock, it may be difficult for our stockholders to sell shares without depressing the market price for the shares or at all, our stock price could decline, and we may be unable to maintain compliance with applicable Nasdaq listing requirements.

If securities or industry analysts do not publish research, or publish inaccurate or unfavorable research, about our business, our stock price and trading volume could decline.

The trading market for our common stock depends, in part, on the research and reports that securities or industry analysts publish about us or our business. The analysts that cover us may cease to publish research on our company at any time in their discretion. If one or more of these analysts cease coverage of our company, or fail to publish reports on us regularly, demand for our common stock could decrease, which might cause our stock price and trading volume to decline. In addition, if one or more of the analysts who cover us downgrade our stock or publish inaccurate or unfavorable research about our business, our stock price would likely decline. If our operating results fail to meet the forecast of analysts, our stock price would likely decline.

Provisions in our corporate charter documents and under Delaware law could make an acquisition of us more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our corporate charter and our bylaws may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which stockholders might otherwise receive a premium for their shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Because our board of directors is responsible for appointing the members of our management team, these provisions could in turn affect any attempt by our stockholders to replace current members of our management team. Among others, these provisions include the following:

- our board of directors is divided into three classes with staggered three-year terms which may delay or prevent a change of our management or a change in control;
- our board of directors has the right to elect directors to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;
- our stockholders are not able to act by written consent or call special stockholders' meetings; as a result, a holder, or holders, controlling a majority of our capital stock are not able to take certain actions other than at annual stockholders' meetings or special stockholders' meetings called by the board of directors, the chairman of the board, the chief executive officer or the president;
- our certificate of incorporation prohibits cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- our stockholders are required to provide advance notice and additional disclosures in order to nominate individuals for election to the board of directors or to propose matters that can be acted upon at a stockholders' meeting, which may discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of our company; and
- our board of directors are able to issue, without stockholder approval, shares of undesignated preferred stock, which makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Our employment arrangements with our executive officers may require us to pay severance benefits to any of those persons who are terminated in connection with a change in control of us, which could harm our financial condition or results.

Certain of our executive officers are parties to employment or other agreements or participants under plans that contain change in control and severance provisions providing for aggregate cash payments for severance and other benefits and acceleration of vesting of stock options in the event of a termination of employment in connection with a change in control of us. The accelerated vesting of options could result in dilution to our existing stockholders and harm the market price of our common stock. The payment of these severance benefits could harm our financial condition and results. In addition, these potential severance payments may discourage or prevent third parties from seeking a business combination with us.

Because we do not anticipate paying any cash dividends on our common stock in the foreseeable future, capital appreciation, if any, will be our stockholders' sole source of gain.

We have never declared or paid cash dividends on our common stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. In addition, the terms of existing or any future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be our stockholders' sole source of gain for the foreseeable future.

Item 1B. Unresolved Staff Comments.

None

Item 2. Properties.

We do not own any real property and lease facilities in Palo Alto and Menlo Park, California and Houston, Texas. Our principal executive offices are located in Houston, Texas where we occupy office space to the terms of a lease agreement that expires on July 31, 2020, which will automatically renew each year for a one year term, unless a three month notice is given to cancel. Our rent under the lease is approximately $3,000 per month.

In March 2017, we entered into an operating facility lease agreement with Bohannon Associates, a California partnership, dated March 17, 2017 (the "Master Lease") for approximately 34,500 rentable square feet of office space located at 1020 Marsh Road, Menlo Park, California and for approximately 17,400 rentable square feet located at 1060 Marsh Road. In September 2017, we opted out of our intent to occupy 1060 Marsh Road. The lease for 1020 Marsh Road commenced in August 2017 for a period of 86 months with one renewal option for a five-year term. Future base rent and additional rent we owed over the lease terms as of December 31, 2019 is $13.0 million.

On September 14, 2018, the Sublease dated August 21, 2018 (the "Sublease Agreement") by and between us and EVA Automation, Inc. ("Subtenant") became effective, whereby we agreed to sublease to Subtenant all of the approximately 34,500 rentable square feet of office space at 1020 Marsh Road, Menlo Park, California currently leased pursuant to the Master Lease. The sublease commenced on October 1, 2018 and the term of the sublease is through October 31, 2024, unless the Master Lease is terminated earlier due to a breach by Subtenant. Future base rent and additional rent Subtenant shall pay to the Company over the sublease term as of December 31, 2019 is $13.0 million.

In October 2018, we executed a lease agreement in Palo Alto, California for approximately 4,240 square feet for office space. The rental term of the lease commenced on October 30, 2018 and expires August 31, 2020. As of December 31, 2019 the obligation for us under this lease was approximately $0.1 million.

We believe that our existing facilities are adequate for our current needs.

Item 3. Legal Proceedings.

We are not currently subject to any material legal proceedings. From time to time, we may be subject to various legal proceedings and claims that arise in the ordinary course of its business activities. Litigation, regardless of the outcome, could have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 4. Mine Safety Disclosures.

Not Applicable

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market for Registrant's Common Equity

Since October 16, 2018, our common stock has been listed on The Nasdaq Global Select Market under the symbol "ARAV". Prior to that, from March 21, 2014 until October 16, 2018, our common stock traded on The Nasdaq Global Select Market under the symbol "VSAR". In connection with the completion of the Merger, on October 15, 2018, our amended and restated certificate of incorporation was amended to effect, on October 16, 2018, a reverse split of our common stock at a ratio of 1-for-6.

Holders

On March 16, 2020, there were 32 stockholders of record of our common stock, one of which was Cede & Co., a nominee for Depository Trust Company, or DTC. All of the shares of our common stock held by brokerage firms, banks and other financial institutions as nominees for beneficial owners are deposited into participant accounts at DTC and are therefore considered to be held of record by Cede & Co. as one stockholder.

Dividend Policy

We have not paid dividends on our common stock. We currently intend to retain any earnings for use in the development and expansion of our business. We, therefore, do not anticipate paying cash dividends on our common stock in the foreseeable future.

Sales of Unregistered Equity Securities

There were no unregistered sales of equity securities by us during the year ended December 31, 2019.

Performance Graph

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide the information required under this item.

Item 6. Selected Financial Data.

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide the information required under this item.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

You should read the following discussion and analysis of our financial condition and results of operations together with our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K. This discussion and other parts of this Form 10-K contain forward-looking statements that involve risks and uncertainties, such as statements of our plans, objectives, expectations and intentions. Our actual results could differ materially from those discussed in these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the section of this Form 10-K entitled "Risk Factors."

Recent Developments

On December 2, 2019, we closed an underwritten public offering in which we issued and sold 3,633,334 shares of our common stock for which we received gross proceeds of approximately $27.3 million pursuant to the terms of a Purchase Agreement with Piper Jaffray & Co. and Cantor Fitzgerald & Co., as representatives of the several underwriters named therein, that we entered into on November 27, 2019.

Overview

We are a clinical-stage biopharmaceutical company developing treatments designed to halt the progression of life-threatening diseases, including cancer and fibrosis. Prior to the Merger we were an endocrine-focused biopharmaceutical company that was developing a long-acting recombinant human growth hormone for the treatment of growth hormone deficiency.

Our lead product candidate, AVB-500, is an ultrahigh-affinity, decoy protein that targets the GAS6-AXL signaling pathway. By capturing serum GAS6, AVB-500 starves the AXL pathway of its signal, potentially halting the biological programming that promotes disease progression. AXL receptor signaling plays an important role in multiple types of malignancies by promoting metastasis, cancer cell survival, resistance to treatments, and immune suppression. The GAS6-AXL signaling pathway also plays a significant role in fibrogenesis.

Our current development program benefits from the availability of a proprietary serum-based biomarker that we expect will help accelerate drug development and reduce risk by allowing us to select a pharmacologically active dose.

In our completed Phase 1 clinical trial with our clinical lead product candidate, AVB-500, we have demonstrated proof of mechanism for AVB-500 in neutralizing GAS6. Importantly, AVB-500 had a favorable safety profile preclinically and in the first in human trial. In December 2018, we initiated the Phase 1b portion of a Phase 1b/2 clinical trial of AVB-500 combined with standard of care therapies in patients with platinum-resistant ovarian cancer and are currently enrolling the expansion cohort in the Phase 1b. In August 2018, the FDA designated as a Fast Track development program the investigation of our lead development candidate, AVB-500, for platinum-resistant recurrent ovarian cancer. In January 2020, we announced that the FDA has cleared our Investigational New Drug (IND) application for investigation of AVB-500, in the treatment of our second oncology indication, clear cell renal cell carcinoma (ccRCC).

As we advance our clinical programs, we are in close contact with our CROs and clinical sites and are assessing the impact of COVID-19 on our studies and current timelines and costs. With the recent and rapidly evolving impact of COVID-19 on patient recruitment in clinical trials and considering patient safety and trial integrity, we have decided to amend our clear cell renal cell carcinoma (ccRCC) trial to initiate treatment at a higher dose given the safety profile seen with the 15 mg/kg dosing cohort of the platinum resistant ovarian cancer (PROC) trial and the initiation of the 20 mg/kg dosing cohort. While this may delay first patient dosing, the overall timelines may not be significantly impacted given the higher starting dose, assuming the COVID-19 situation does not interfere with ongoing clinical studies. We will pause new enrollment in its IgA nephropathy (IgAN) trial until the risk of unnecessary exposure of patients to COVID-19 is decreased.

Important Note

This Management's Discussion and Analysis of Financial Condition and Results of Operations includes a discussion of our operations for the years ended December 31, 2019 and December 31, 2018, which reflects the operations of Private Aravive, for the entire year ended December 31, 2019 but only a portion of the year for the year ended December 31, 2018 due to the fact that the Merger was consummated in October 2018. Accordingly, the results of operations reported for the years ended December 31, 2019 and 2018, in this Management's Discussion and Analysis are not comparable.

Due to the substantial changes in our assets, liabilities and operations resulting from the completion of the Merger on October 12, 2018, our historical financial results do not provide a reasonable basis from which to predict the merged company's future financial results or condition.

References in this report to “we,” “us,” “our” and similar first-person expressions refer to Aravive, Inc. (formerly known as Versartis, Inc.) and its subsidiaries, including Private Aravive. References to “Versartis, Inc.” or “Private Aravive” refer to those respective companies prior to the completion of their merger in October 2018.

Financial overview

Revenue

To date, we have not generated any revenue from commercial sales of any of our product candidates. However, we generated grant revenue of $4.8 and $1.4 million for the years ended December 31, 2019 and 2018, respectively, from our CPRIT Grant.

In the future, we may generate revenue from a variety of sources, including product sales if we develop products which are approved for sale, license fees, milestones, research and development and royalty payments in connection with strategic collaborations or government contracts, or licenses of our intellectual property.

Research and development expenses

We recognize both internal and external research and development expenses as incurred. Our external research and development expenses consist primarily of:

- the cost of acquiring and manufacturing clinical trial and other materials, including expenses incurred under agreements with contract manufacturing organizations;
- expenses incurred under agreements with contract research organizations, investigative sites, and consultants that conduct our clinical trials;
- other costs associated with development activities, including additional studies; and
- Facility costs, including rent.

Internal research and development costs consist primarily of salaries and related fringe benefit costs for our employees (such as workers’ compensation and health insurance premiums), stock-based compensation charges and travel costs.

General and administrative expenses

General and administrative expenses consist principally of personnel-related costs, professional fees for legal, consulting, audit and tax services, rent and other general operating expenses not included in research and development.

Other income (expense), net

Other income (expense), net is primarily comprised of sublease income for our 1020 Marsh property lease and gains and losses on foreign currency transactions related to third party contracts with foreign-based contract manufacturing organizations.

Results of operations

Comparison of the years ended December 31, 2019 and 2018

The following table summarizes our net loss during the periods indicated (in thousands, except percentages):

	Year Ended December 31,		Increase/ (Decrease)	
	2019	2018		
Revenue:				
Grant revenue	$ 4,753	$ 1,371	$ 3,382	247%
Total revenue	4,753	1,371	3,382	247%
Operating expenses:				
Research and development	12,836	11,075	1,761	16%
Write-off of acquired in-process research and development	—	38,313	(38,313)	NM (1)
General and administrative	13,691	27,395	(13,704)	-50%
Total operating expenses	26,527	76,783	(50,256)	-65%
Loss from operations	(21,774)	(75,412)	(53,638)	-71%
Interest income	1,022	989	33	3%
Interest expense	—	(2,429)	2,429	NM (1)
Other income (expense), net	2,534	519	2,015	388%
Net loss	$ (18,218)	$ (76,333)	$ (58,115)	-76%

(1) Not meaningful.

Grant revenue

In 2018, we completed the Merger with Private Aravive. Private Aravive has a grant with CPRIT. Grant revenue increased by $3.4 million, or 247%, to $4.8 million in 2019 from $1.4 million from the same period in 2018 and was derived solely from the CPRIT Grant for the research and development of AVB-500. The increase was primarily due to one quarter of activity in 2018 as compared to two quarters of activity in 2019. Recognition of Grant revenue was completed as of the end of the second quarter of 2019 as we have recognized the full amount related to the contract.

Research and development expense

Research and development expense increased by $1.8 million, or 16%, to $12.8 million in 2019 from $11.1 million for the same period in 2018. The increase was primarily due to increased expenses incurred in the clinical, pre-clinical and manufacturing activities of AVB-500 in 2019 compared to the continued winddown expenses in 2018 relating to the somavaratan program which was terminated following the Phase 3 VELOCITY trial failure.

In 2018, we also had a large write-off of our in-process research and development intangible asset of $38.3 million, presented separately in the consolidated statements of operations for the year ended December 31, 2018, related to the Merger with Private Aravive which is considered to be part of our research and development expense. For the period from October 13, 2018 through December 31, 2018, research and development costs mostly related to AVB-500 clinical trials along with additional costs incurred with winding down our somavaratan program.

General and administrative expense

General and administrative expense decreased by $13.7 million, or 50%, to $13.7 million in 2019 from $27.4 million for the same period in 2018. The decrease was primarily driven by a smaller workforce, absence of Merger related costs and other operating expenses as a result of the termination of the somavaratan program following the Phase 3 VELOCITY trial failure. The decrease is partially offset by an increase in our operating lease expenses in 2019 related to the adoption of the new lease accounting standard.

Interest expense

Interest expense decreased primarily due to interest charges related to our build-to-suit lease obligation in 2018 which was accounted for differently in 2019 due to the adoption of the new lease accounting standard.

Other income (expense), net

Other income, improved by $2.0 million, or 388%, to $2.5 million in 2019 from $0.5 million of other income for the same period in 2018. The increase in other income primarily relates to sublease income recorded for all of 2019 as compared to a portion of the fourth quarter for the same period in 2018.

Liquidity and capital resources

Since our inception and through December 31, 2019, we have financed our operations through private placements of our equity securities, debt financing, CPRIT grant proceeds, and our initial public offering in 2014 along with additional common stock offerings in January 2015, October 2016, and December 2019 as well as a $40.0 million upfront payment received from a license agreement with Teijin. At December 31, 2019, we had an accumulated deficit of approximately $470.1 million and working capital of $63.3 million, primarily as a result of research and development and general and administrative expenses. At December 31, 2019, we had cash and cash equivalents of approximately $65.1 million, a majority of which is invested in money market funds at several highly rated financial institutions. As a result of the Merger with Private Aravive, we acquired approximately $5.3 million of additional cash and cash equivalents, and as a merged company our primary use of our capital has been to fund our clinical development programs, specifically for our product candidate AVB-500. For the year ended December 31, 2019, we have received approximately $3.0 million of additional funding from our CPRIT Grant. At December 31, 2019, we have an unbilled receivable balance from the CPRIT Grant of $1.6 million included in other current assets.

We will need to obtain additional financing to pursue our clinical development programs, build out our pipeline and fund operations for the foreseeable future and we will continue to seek funds through equity or debt financings, collaborative or other arrangements with corporate sources, or through other sources of financing. Although management has been successful in raising capital in the past, there can be no assurance that we will be successful or that any needed financing will be available in the future at terms acceptable to us. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategies. We anticipate that we will need to raise substantial additional capital, the requirements of which will depend on many factors, including:

- the rate of progress and cost of our clinical studies;
- the timing of, and costs involved in, seeking and obtaining approvals from the FDA and other regulatory authorities;
- the cost of preparing to manufacture on a larger scale;
- the costs of commercialization activities if any future product candidate is approved, including product sales, marketing, manufacturing and distribution;
- the degree and rate of market acceptance of any products launched by us or future partners;
- the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- our ability to enter into additional collaboration, licensing, commercialization or other arrangements and the terms and timing of such arrangements; and
- the emergence of competing technologies or other adverse market developments.

If we are unable to raise additional funds when needed, we may be required to delay, reduce, or terminate some or all of our development programs and clinical trials. We may also be required to sell or license to others technologies or clinical product candidates or programs that we would prefer to develop and commercialize ourselves.

Cash flows

The following table sets forth the primary sources and uses of cash and cash equivalents for each of the periods presented below:

	Year Ended December 31,	
	2019	2018
	(In thousands)	
Net cash (used in) provided by:		
Operating activities	$ (17,081)	$ (29,257)
Investing activities	—	3,168
Financing activities	25,250	1,948
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 8,169	$ (24,141)

Cash used in operating activities

Net cash used in operating activities was $17.1 million and $29.3 million in 2019 and 2018, respectively, which was primarily due to the use of funds in our operations related to the development of AVB-500, our product candidate. Cash used in operating activities in 2019 decreased significantly compared to 2018 due to the termination of a number of supplier contracts that occurred in 2018 partially offset by the receipt of CPRIT Grant funds of approximately $3.0 million. Cash used in operating activities in 2018 of $29.3 million reflects a net loss of $76.3 million and was mostly related to operational expenses. This loss was reduced by some large noncash amounts related to the write-off of acquired in-process research and development, or IPR&D and stock-based compensation expense.

Cash provided by investing activities

Net cash provided by investing activities was $3.2 million in 2018 primarily related to cash received upon the Merger offset by cash paid to acquire IPR&D. Net cash from investing activities in 2019 was zero.

Cash provided by financing activities

Net cash provided by financing activities was $25.3 million and $2.0 million in 2019 and 2018, respectively. The increase in cash provided by financing activities primarily relates to proceeds received from issuance of our common stock in a public offering which was completed in December of 2019.

As of December 31, 2019, we had cash and cash equivalents of approximately $65.1 million. We believe that our existing cash and cash equivalents will be sufficient to sustain operations for at least the next 12 months from the issuance of these financial statements as we continue the development of AVB-500. We will need to obtain additional financing to advance our clinical development program to later stages of development and fund operations for the foreseeable future and we will continue to seek funds through equity or debt financings, collaborative or other arrangements with corporate sources, or through other sources of financing.

Off-balance sheet arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

JOBS Act accounting election

The Jumpstart Our Business Startups Act of 2012, or the JOBS Act, permits an "emerging growth company" to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. For the year ended December 31, 2019, we chose to "opt out" of this provision and, as a result, we complied with new or revised accounting standards as required when they were adopted. As of December 31, 2019, we are no longer an emerging growth company.

Critical accounting policies, significant judgments and use of estimates

The Management's Discussion and Analysis of Financial Condition and Results of Operations is based upon our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America, ("U.S. GAAP"). The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, and expenses. On an ongoing basis, we evaluate our critical accounting policies and estimates. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable in the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions and conditions. We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

In February 2016, the FASB issued ASU No. 2016-02, "Leases (Topic 842)" ("ASU 2016-02"). The amendments in this update create Topic 842, Leases, and supersede the leases requirements in Topic 840, Leases. Topic 842 specifies the accounting for leases. The objective of Topic 842 is to establish the principles that lessees and lessors shall apply to report useful information to users of financial statements about the amount, timing, and uncertainty of cash flows arising from a lease. The main difference between Topic 842 and Topic 840 is the recognition of lease assets and lease liabilities for those leases classified as operating leases under Topic 840. Topic 842 retains a distinction between finance leases and operating leases. The classification criteria for distinguishing between finance leases and operating leases are substantially similar to the classification criteria for distinguishing between capital leases and operating leases in the previous lease guidance. The result of retaining a distinction between finance leases and operating leases is that under the lessee accounting model in Topic 842, the effect of leases in the statement of comprehensive income and the statement of cash flows is largely unchanged from previous GAAP. The amendments in ASU 2016-02 became effective for us on January 1, 2019, we wrote off our previously recorded build-to-suit asset as a result of adoption and recorded a right-of-use asset for our existing leases. The full adoption impact of the ASU 2016-02 is illustrated in the accompanying consolidated financial statements.

Grant Revenue

Revenues from the CPRIT Grant are recognized when qualifying costs are incurred and there is reasonable assurance that the conditions of the award have been met for collection. Proceeds received prior to the costs being incurred or the conditions of the award being met are recognized as deferred revenue until the services are performed and the conditions of the award are met. As of December 31, 2019, the Company had an unbilled receivable from CPRIT of $1.6 million, which is reflected in prepaid expenses and other current assets on the accompanying consolidated balance sheet.

Research and development expense

Research and development costs are expensed as incurred. Research and development expense includes payroll and personnel expenses; consulting costs; external contract research and development expenses; and allocated overhead, including rent and utilities, and relate to both company-sponsored programs as well as costs incurred pursuant to reimbursement arrangements. Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and capitalized and recognized as an expense as the goods are delivered or the related services are performed.

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued research and development expenses. This process involves reviewing contracts and purchase orders, reviewing the terms of our license agreements, communicating with our applicable personnel to identify services that have been performed on our behalf, and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of actual cost. The majority of our service providers invoice us monthly in arrears for services performed. We make estimates of our accrued expenses as of each consolidated balance sheet date in our consolidated financial statements based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include fees to:

- contract manufacturers in connection with the production of clinical trial materials;
- contract research organizations and other service providers in connection with clinical studies;

- investigative sites in connection with clinical studies;
- vendors in connection with preclinical development activities; and
- professional service fees for consulting and related services.

We base our expenses related to clinical studies on our estimates of the services received and efforts expended pursuant to contracts with multiple research institutions and contract research organizations that conduct and manage clinical studies on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract, and may result in uneven payment flows and expense recognition. Payments under some of these contracts depend on factors such as the successful enrollment of patients and the completion of clinical trial milestones. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual accordingly. Our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in our reporting changes in estimates in any particular period. To date, there have been no material differences from our estimates to the amount actually incurred. However, due to the nature of these estimates, we cannot assure you that we will not make changes to our estimates in the future as we become aware of additional information about the status or conduct of our clinical studies or other research activity.

Right-of-Use Lease Accounting

The Company adopted ASC 842 on January 1, 2019. For the periods prior to January 1, 2019, our leases were accounted for under ASC 840. We lease all of our office space in conducting our business. At inception, we determine whether an agreement represents a lease and at commencement we evaluate each lease agreement to determine whether the lease is an operating or financing lease. As described below under "Recent Accounting Pronouncements", in our consolidated financial statements included elsewhere in the Annual Report on Form 10-K, we adopted ASU 2016-02. We elected to adopt the standard on January 1, 2019 using the alternative transition method provided by ASU 2018-11 whereby we recorded right-of-use ("ROU") assets and lease liabilities for our existing leases as of January 1, 2019, as well as a cumulative-effect adjustment to accumulated deficit of initially applying the new standard as of January 1, 2019.

The new standard provides a number of optional practical expedients in transition. We have elected the practical expedients to not reassess its prior conclusions about lease identification under the new standard, to not reassess lease classification, and to not reassess initial direct costs. We have elected the practical expedient allowing the use-of-hindsight which doesn't require us to reassess the lease term of its leases based on all facts and circumstances through the effective date.

The new guidance also provides practical expedients for ongoing lease accounting. We have elected the recognition exemption for short-term lease for all leases that qualify. Under this exemption, we will not recognize ROU assets or lease liabilities on the consolidated balance sheet for those leases that qualify as a short-term lease, which includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. We have also elected the practical expedient to not separate lease and non-lease components for all equipment and real-estate leases.

With the adoption of ASU 2016-02, we recorded an operating lease right-of-use asset and an operating lease obligation on the consolidated balance sheet. ROU assets represent our ROU of the underlying asset for the lease term and the lease obligation represents our commitment to make the lease payments arising from the lease. ROU obligations are recognized at the commencement date based on the present value of remaining lease payments over the lease term and ROU assets are calculated as the lease liability, adjusted by unamortized initial direct costs, unamortized lease incentives received, cumulative deferred or prepaid lease payments, and accumulated impairment losses. As our leases do not provide an implicit rate, we have used an estimated incremental borrowing rate based on the information available at the adoption date in determining the present value of lease payments. The lease term may include options to extend or terminate the lease when it is reasonably certain that we will exercise that option. Operating lease expense is recognized on a straight-line basis over the lease term, subject to any changes in the lease or expectations regarding the terms. Variable lease costs such as common area costs and property taxes are expensed as incurred. For all lease agreements we have combined lease and non-lease components. Leases with an initial term of 12 months or less are not recorded on the balance sheet.

Prior to our adoption of ASU 2016-02, when our lease agreements contained renewal options, tenant improvement allowances, rent holidays and rent escalation clauses, we recorded a deferred rent asset or liability equal to the difference between the rent expense and the future minimum lease payments due. The lease expense related to operating leases was recognized on a straight-line basis in the consolidated statements of operations over the term of each lease.

The most significant estimates used by management in accounting for right-of-use leases and the impact of these estimates are as follows:

- Economic life- Our estimated economic life of the building considers life added back due to tenant improvements.
- Incremental borrowing rate- We estimate our incremental borrowing rate. For build-to-suit leases recorded on our consolidated balance sheets with a related build-to-suit lease obligation, the incremental borrowing rate is used in allocating our rental payments between interest expense and ground rent expense.

- Fair market value of leased asset- The fair market value of a build-to-suit lease property is based on replacement cost of the pre-construction shell and comparable market data. Fair market value is used in determining the amount of the property asset and related build-to-suit lease obligation to be recognized on our consolidated balance sheet for build-to-suit leases.

Stock-based compensation expense

For the years ended December 31, 2019 and 2018, stock-based compensation expense was $3.4 million and $16.1 million, respectively. As of December 31, 2019, we had approximately $2.0 million of total unrecognized compensation expense, which we expect to recognize over a weighted-average period of approximately 2.8 years. The intrinsic value of all outstanding stock options as of December 31, 2019 was approximately $16.3 million, of which all related to vested options. We expect to continue to grant equity incentive awards in the future as we seek to retain our existing employees.

Stock-based compensation costs related to stock options granted to employees are measured at the date of grant and to the options assumed in connection with the Merger are measured at the date of the Merger based on the estimated fair value of the award, net of estimated forfeitures. We estimate the grant date fair value, and the resulting stock-based compensation expense, using the Black-Scholes option-pricing model. The grant date fair value of stock-based awards is recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the award. Stock options we grant to employees generally vest over four years. The fair value of options assumed in connection with the Merger were determined using the Black-Scholes option-pricing model with assumptions derived immediately following the completion of the Merger and were recognized as operating expenses in the 2018 consolidated statement of operations.

The Black-Scholes option-pricing model requires the use of highly subjective assumptions to estimate the fair value of stock-based awards. If we had made different assumptions, our stock-based compensation expense, net loss and net loss per share of common stock could have been significantly different. These assumptions include:

- Expected volatility: Beginning in 2018, we had enough historical stock price information in order to value the options assumed in the Merger. We continue to utilize our historical stock prices in order to estimate the expected volatility.
- Expected term: We do not believe we are able to rely on our historical exercise and post-vesting termination activity to provide accurate data for estimating the expected term for use in estimating the fair value-based measurement of our options. Therefore, we have opted to use the “simplified method” for estimating the expected term of options.
- Risk-free rate: The risk-free interest rate is based on the yields of U.S. Treasury securities with maturities similar to the expected time to liquidity.
- Expected dividend yield: We have never declared or paid any cash dividends and do not presently plan to pay cash dividends in the foreseeable future. Consequently, we used an expected dividend yield of zero.

See Note 8 to our audited consolidated financial statements included elsewhere in this annual report on Form 10-K for information concerning certain of the specific assumptions used in applying the Black-Scholes option-pricing model to determine the estimated fair value of employee stock options assumed in the Merger and granted in 2019. In addition to the assumptions used in the Black-Scholes option-pricing model, we must also estimate a forfeiture rate to calculate the stock-based compensation expense for our awards. We will continue to use judgment in evaluating the expected volatility, expected terms, and forfeiture rates utilized for our stock-based compensation expense calculations on a prospective basis.

Income taxes

We file U.S. federal income tax returns, Texas and California state tax returns. To date, we have not been audited by the Internal Revenue Service or any state income tax authority; however, all tax years remain open for examination by federal and state tax authorities. We use the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. We assess the likelihood that the resulting deferred tax assets will be realized. A valuation allowance is provided when it is deemed more likely than not that some portion or all of a deferred tax asset will not be realized.

As of December 31, 2019, our total gross deferred tax assets were $17.8 million. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance. The deferred tax assets were primarily comprised of federal and state tax net operating losses and tax credit carryforwards. Utilization of net operating losses and tax credit carryforwards may be limited by the “ownership change” rules, as defined in Section 382 of the Internal Revenue Code (any such limitation, a “Section 382 limitation”). Similar rules may apply under state tax laws. We have performed an analysis to determine whether an “ownership change” occurred from inception up to the Private Aravive's acquisition date. Based on this analysis, management determined that both Versartis, Inc. and Private Aravive did experience ownership changes, which resulted in a significant impairment of the net operating losses and credit carryforwards. As such, the net operating loss carryforwards have been reduced by $306 million. The tax credit carryforwards have been reduced by $39.5 million.

The Tax Cuts and Jobs Act ("the Act") was enacted on December 22, 2017. The Act reduces the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign sourced earnings. We are required to recognize the effect of the tax law changes in the period of enactment, such as determining the estimated transition tax, re-measuring our U.S. deferred tax assets and liabilities at a 21% rate as well as reassessing the net realizability of our deferred tax assets and liabilities.

Accordingly, we remeasured certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future. The provisional amount related to the re-measurement of our deferred tax balance is a reduction of approximately $33 million. Due to the corresponding valuation allowance fully offsetting deferred taxes, there is no income statement impact.

In December 2017, the SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (SAB 118) which allows us to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. In Q4 2019, we completed our analysis within the measurement period in accordance with SAB 118 and found no change to the provisional amount on 2019 tax provision.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

The Company is a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and is not required to provide the information required under this item.

Item 8. Financial Statements and Supplementary Data.

The following consolidated financial statements of the registrant, related notes and reports of independent registered public accounting firms are set forth beginning on page F-1 of this report.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None

Item 9A. Controls and Procedures.

(a) Evaluation of Disclosure Controls and Procedures

An evaluation as of December 31, 2019 was carried out under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our “disclosure controls and procedures,” which are defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended (the Exchange Act), as controls and other procedures of a company that are designed to ensure that the information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. Based upon that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of December 31, 2019.

(b) Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) of the Exchange Act. Our internal control system is designed to provide reasonable assurance regarding the preparation and fair presentation of financial statements for external purposes in accordance with generally accepted accounting principles. All internal control systems, no matter how well designed, have inherent limitations and can provide only reasonable assurance that the objectives of the internal control system are met.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting, based on criteria established by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in its 2013 Internal Control-Integrated Framework. Based on our evaluation, we concluded that our internal control over financial reporting was effective as of December 31, 2019.

As of December 31, 2019, we are a non-accelerated filer, our independent registered accounting firm is not required to issue an attestation report on our internal control over financial reporting**.**

(c) Changes in Internal Control over Financial Reporting

Our management, including our Chief Executive Officer and Chief Financial Officer, has evaluated any changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2019, and has concluded that there was no change during such period that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

Mr. Shah

On March 26, 2020, we entered into an offer letter with Mr. Shah that superseded the offer letter with private Aravive and provides that if we terminate his employment for any reason other than cause or permanent disability, or a qualifying termination and not in connection with a change in control, if Mr. Shah (i) executes and does not revoke a release of claims within 60 days following the date he terminates employment with us and, (ii) returns all of our property in his possession he will be entitled to (a) nine months of salary continuation payments (b) if he timely elects to continue his health insurance coverage under COBRA, we will pay a portion of his monthly COBRA premiums (at the same rate that we pay for active employees) for up to twelve months following the date he terminates employment with us. In addition, he will be entitled to (c) 12 months accelerated vesting of stock options and RSUs awarded to Mr. Shah and (d) up to 9 months post-termination to exercise any vested shares subject to such option. In addition, if terminated in connection with a change of control, severance benefits will be those specified under our 2019 Equity Incentive Plan and our Severance Plan, which provides for specified severance benefits to certain eligible officers and employees of our company. In addition, if during the twelve month period commencing on the closing date of a Change in Control we terminate his employment for any reason other than Cause, death or Disability or he resigns for Good Reason, pursuant to the Severance Plan, all unvested equity awards will immediately vest, subject to certain restriction. Mr. Shah would receive a "Severance Multiplier" of 12 under the Severance Plan, which will entitle him to: cash severance equivalent to 12 multiplied by the sum of his monthly base salary and monthly annual bonus target; up to 12 months' payment of health insurance coverage and up to 12 months to exercise vested stock options. In addition, under the 2019 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Mr. Shah would be eligible for full accelerated vesting of his outstanding stock options and RSUs. The foregoing summary of the material provisions of the offer letter is not complete and is qualified in its entirety by reference to the full text of such agreement, a copy of which is filed as Exhibit 10.69 to this Annual Report on Form 10-K and is incorporated herein by reference.

Dr. McIntyre

On March 26, 2020, we entered into an offer letter with Dr. McIntyre that superseded the offer letter with private Aravive and provides that if we terminate her employment for any reason other than cause or permanent disability, or a qualifying termination and not in connection with a change in control, if Dr. McIntyre (i) executes and does not revoke a release of claims within 60 days following the date she terminates employment with us and (ii) returns all of our property in his possession she will be entitled to (a) nine months of salary continuation payments (b) if she timely elects to continue her health insurance coverage under COBRA, we will pay a portion of her monthly COBRA premiums (at the same rate that we pay for active employees) for up to twelve months following the date she terminates employment with us. In addition, she will be entitled to (c) 12 months accelerated vesting of stock options and RSUs awarded to Dr. McIntyre and (d) up to 9 months post-termination to exercise any vested shares subject to such option. In addition, if terminated in connection with a change of control, severance benefits will be those specified under our 2019 Equity Incentive Plan and our Change in Control Severance Plan, which provides for specified severance benefits to certain eligible officers and employees of our company. In addition, if during the twelve month period commencing on the closing date of a Change in Control we terminate her employment for any reason other than Cause or death or disability or she resigns for Good Reason, all unvested equity awards will immediately vest, subject to certain restriction. Dr. McIntyre would receive a "Severance Multiplier" of 12 under the Severance Plan, which will entitle her to: cash severance equivalent to 12 multiplied by the sum of her monthly base salary and monthly annual bonus target; up to 12 months' payment of health insurance coverage and up to 12 months to exercise vested stock options. In addition, under the 2019 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Dr. McIntyre would be eligible for full accelerated vesting of her outstanding stock options and RSUs. The foregoing summary of the material provisions of the offer letter is not complete and is qualified in its entirety by reference to the full text of such agreement, a copy of which is filed as Exhibit 10.70 to this Annual Report on Form 10-K and is incorporated herein by reference.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

BOARD OF DIRECTORS AND EXECUTIVE OFFICERS OF THE COMPANY

The following table sets forth information concerning our directors and executive officers, including their ages as of March 16, 2020. There are no family relationships among any of our directors or executive officers.

Name	Age	Position(s)
Rekha Hemrajani (1)	50	President, Chief Executive Officer and Director
Jay P. Shepard (2)	62	Chairman of the Board of Directors
Vinay Shah (3)	57	Chief Financial Officer
Gail McIntyre, Ph.D.(4)	57	Chief Scientific Officer
Srinivas Akkaraju, M.D., Ph.D.	52	Director
Amato Giaccia, Ph.D.	61	Director
Robert E. Hoffman	54	Director
Raymond Tabibiazar , M.D.	49	Director
Eric Zhang	38	Director

(1) Ms. Hemrajani was appointed President and Chief Executive Officer and director effective January 9, 2020 upon Mr. Shepard's transition from an executive officer to his current position as Chairman of the board of directors.

(2) Mr. Shepard served as our President and Chief Executive Officer from May 2015 until January 9, 2020 when he resigned as President and Chief Executive Officer and was named Chairman of the board of directors.

(3) Mr. Shah has served as our Chief Financial Officer since October 12, 2018.

(4) Dr. McIntrye has served as our Chief Scientific Officer since February 12, 2019.

Rekha Hemrajani, President, Chief Executive Officer and Director

Ms. Hemrajani has served as our President and Chief Executive Officer and a member our board of directors since January 9, 2020. From March 2019 to September 2019, she served as the Chief Operating Officer and Chief Financial Officer of Arcus Biosciences (NYSE: RCUS), a biotechnology company, where she had responsibility for corporate strategy, business and corporate development, finance, investor relations, corporate communications, strategic planning and human resources. From March 2016 to March 2019, Ms. Hemrajani was the Chief Operating Officer of FLX Bio, Inc. (now named RAPT Therapeutics, Inc. (NASDAQ: RAPT)), a biotechnology company, where she was responsible for corporate strategy and development, investor and media relations, corporate communications, finance and strategic marketing. From February 2015 to March 2016, Ms. Hemrajani was the Chief Financial Officer and Senior Vice President of Business and Financial Operations at 3-V Biosciences, Inc. (now Sagimet Biosciences, Inc.), a privately held biotechnology company, with responsibility for corporate strategy, corporate development, finance, investor relations and G&A operations. From November 2013 to February 2015, Ms. Hemrajani advised privately held companies on strategic corporate development and financing activities through her consulting firm, Ravinia Consulting. Previously, Ms. Hemrajani was Vice President, Head of Licensing and Mergers and Acquisitions at Onyx Pharmaceuticals, Inc., a biotechnology company, and Vice President of Business Development at Exelixis, Inc., a biotechnology company. Ms. Hemrajani began her career in investment banking at firms such as Credit Suisse, First Boston and Lehman Brothers, where she focused on the biopharmaceutical and healthcare sector. Since May 2019, Ms. Hemrajani has also served as a member of the Board of Directors and the audit committee of the Board of Directors of Adverum Biotechnologies, Inc. (Nasdaq: ADVM), a clinical-stage gene therapy company.

We believe Ms. Hemrajani is able to make valuable contributions to the board of directors due to her extensive knowledge of the biopharmaceutical industry and her prior and current experience as an executive officer.

Jay P. Shepard, Chairman of the Board of Directors

Mr. Shepard has served as the Chairman of the board of directors since January 9, 2020, served as our President and Chief Executive Officer from May 2015 until January 9, 2020 and as a member of the board of directors since December 2013. From December 2013 to May 2015, Mr. Shepard also served as the chairman of the board of directors. Until May 2015, Mr. Shepard was an Executive Partner at Sofinnova Ventures, or Sofinnova, a venture capital firm focused on the healthcare industry, which he joined as an Executive in Residence in 2008. Mr. Shepard previously served as President and Chief Executive Officer and was a member of the board of directors of NextWave Pharmaceuticals, Inc., a specialty pharmaceutical company developing and commercializing unique pediatric products utilizing proprietary drug delivery technology that was acquired by Pfizer, Inc. in November 2012, from January 2010 to November 2012. From December 2005 to October 2007, Mr. Shepard served as President and Chief Executive Officer and a member of the board of directors of Ilypsa, Inc., a biopharmaceutical company pioneering novel non-absorbed polymeric drugs for renal and metabolic disorders that was acquired by Amgen in July 2007. Mr. Shepard has served on the board of directors of numerous public and private companies, including Ilypsa, Inc., Relypsa, Inc., Intermune, Inc., Bullet Biotechnology, Inc., Marinus Pharmaceuticals, Inc., and Durect Corporation. Currently, Mr. Shepard serves on the board of directors of Esperion Therapeutics, Inc., a pharmaceutical company, and of the Christopher & Dana Reeve Foundation. Mr. Shepard holds a B.S. in Business Administration from the University of Arizona.

We believe Mr. Shepard is able to make valuable contributions to the board of directors due to his extensive knowledge of the biopharmaceutical industry and his prior and current experience as an executive officer, including as the former Chief Executive Officer of our company.

Vinay Shah, Chief Financial Officer

Mr. Shah has served as our Chief Financial Officer since the Merger was completed on October 12, 2018. Mr. Shah also served as the Chief Financial Officer of Private Aravive since 2010, initially as a consultant and from 2017 as an employee. Mr. Shah brings more than 18 years of financial management experience in the medical device and biopharmaceutical industries to our company. From 2008 until 2016, he served in various positions at Pacira Pharmaceuticals Inc., a specialty pharmaceutical company, including Executive Director of Finance and Executive Director of Strategy Analytics, initially as a consultant and since 2010 as an employee. Before Pacira Pharmaceuticals Inc., Mr. Shah worked for Cardinal Health's medical device group in various finance management positions. The group was subsequently consolidated and spun off as CareFusion and then sold to Becton, Dickinson and Company. His prior work experience includes positions at Pricewaterhouse Coopers LLP and KPMG in India and the Middle East. Mr. Shah received a Bachelor of Commerce degree from Ranchi University in India. He is a Chartered Accountant from the Institute of Chartered Accountants in India and has an MBA from W.P. Carey School of Business at Arizona State University.

Gail McIntyre, Ph.D., Chief Scientific Officer

Dr. McIntrye has served as our Chief Scientific Officer since February 2019. Dr. McIntyre also served as our Senior Vice President of Research and Development from the Merger until February 2019 and served as Private Aravive's Senior Vice President of Research and Development from January 2017 to October 2018 and a consultant to Private Aravive from August 2016 until January 2017. Having brought multiple drugs to market, Dr. McIntyre has more than 20 years of experience in drug development, strategic business development, licensing and M&A activities. Dr. McIntyre has served as a principal at IntelliDev Consulting, LLC providing consulting services to several biotechnology companies for three years, while also serving as VP of Development for Meryx, Inc. from January 2014 until January 2016. Prior to that, Dr. McIntyre held the position of senior vice president of research at Furiex Pharmaceuticals, Inc. and previously served as head of Pharmaceutical Product Development LLC's (PPD) compound partnering business. At both Furiex and PPD, she strategized and managed all preclinical and clinical activities for drug development programs and was responsible for identification of new partnering opportunities and technical due diligence for both in-licensing opportunities and new business acquisitions. At PPD, she led the partnering and the in-licensing of Alogliptin from Syrrx, Inc. at preIND stage and the licensing to Takeda at Phase 2. She was instrumental to the licensing of Dapoxetine to what is currently Johnson & Johnson and then The Menarini Group. She played a pivotal role in the $1.1 billion acquisition of Allergan in 2014 and successfully negotiated with CSS on scheduling for Viberzi, in addition to driving all aspects of development. Dr. McIntyre has authored more than 30 regulatory submissions and is a board-certified toxicologist. Her experience covers multiple therapeutic areas including oncology (including immune-oncology), infectious diseases, central nervous system, gastrointestinal, and metabolic/endocrine as well as various therapies including small drugs, treatment vaccines, antibodies, immunoconjugates and peptide mimetics. Dr. McIntyre is also board certified in Clinical Pathology (hematology and clinical chemistry) by the American Society of Clinical Pathology. Dr. McIntyre received her B.A. in Biology from Merrimack College. She earned M.S. and Ph.D. degrees in Biochemistry and Biophysics from the University of North Carolina at Chapel Hill.

Srinivas Akkaraju, M.D., Ph.D., Director

Dr. Akkaraju has served as a member of the board of directors since July 2013. Dr. Akkaraju previously served as a member of the board of directors from February 2011 to February 2013. Since June 2016, Dr. Akkaraju has been a managing member of Samsara BioCapital GP, LLC, the general partner of Samsara BioCapital LP. From February 2016 until June 2016, Dr. Akkaraju was a Senior Advisor of Sofinnova Ventures. From April 2013 to February 2016, Dr. Akkaraju served as a Managing General Partner at Sofinnova Ventures. Prior to joining Sofinnova, Dr. Akkaraju was a Managing Director at New Leaf Venture Partners, or New Leaf, from January 2009 to April 2013. From September 2006 to December 2008, Dr. Akkaraju served as a managing director at Panorama Capital, LLC, a private equity firm founded by the former venture capital investment team of J.P. Morgan Partners, LLC, or JPMP, a private equity division of JPMorgan Chase & Co. From April 2001 to September 2006, Dr. Akkaraju was a part of the health care

investment team at JPMP, most recently as Partner. Dr. Akkaraju has served on the boards of directors of numerous public and private companies, including Synageva BioPharma Corp., Barrier Therapeutics, Inc. aTyr Pharma, Inc., ZS Pharma, Inc. and EyeTech Pharmaceuticals Inc., all of which are or were publicly traded biotechnology companies, and Amarin Corporation plc, a foreign publicly traded biotechnology company, and currently serves on the boards of directors of Intercept Pharmaceuticals, Inc., Syros Pharmaceuticals, Inc., Principia Biopharma Inc. and Seattle Genetics, Inc, all of which are publicly traded companies. Dr. Akkaraju holds a B.A. in Biochemistry and Computer Science from Rice University and an M.D. and Ph.D. in Immunology from Stanford University School of Medicine.

We believe that Dr. Akkaraju is able to make valuable contributions to the board of directors due to his experience investing in and serving as a director for companies in the biotechnology and healthcare industries.

Amato Giaccia, Ph.D., Director

Dr. Giaccia has served as a member of the board of directors since the Merger was completed on October 12, 2018. Prior to the closing date of the Merger, he also served as a member of the board of directors of Private Aravive from August 2010 to October 2018 and as Acting Chief Scientific Officer of Private Aravive from January 2017 until the Merger was completed on October 12, 2018. Dr. Giaccia also served as Professor of Radiation Oncology, Associate Chair for Research & Director of the Division of Radiation & Cancer Biology in the Department of Radiation Oncology at Stanford University School of Medicine, a position he has held since 2011 and has been a Director of Oxford Institute of Radiation Oncology since January 2019. He is also the Associate Director for Basic Science and leader of the Radiation Biology Program in Stanford Cancer Institute. He has also served as the Director of the Cancer Biology Interdisciplinary Graduate Program and is currently the “Jack, Lulu and Sam Willson Professor in Cancer Biology” in the Stanford University School of Medicine. He received his Ph.D. from the University of Pennsylvania.

We believe that Dr. Giaccia is able to make valuable contributions to the board of directors due to his extensive scientific and medical knowledge and experience and his familiarity with Aravive’s technology as the leader of the laboratory in which it originated.

Robert E. Hoffman, Director

Mr. Hoffman has served as a member of the board of directors since the Merger was completed on October 12, 2018. Since April 2017, Mr. Hoffman has served as Chief Financial Officer and Senior Vice President, Finance at Heron Therapeutics, Inc., a biotechnology company. From September 2016 to April 2017, Mr. Hoffman served as Executive Vice President and Chief Financial Officer of Innovus Pharmaceuticals, Inc., a biopharmaceutical company. Prior to joining Innovus Pharmaceuticals, Inc., Mr. Hoffman served as Chief Financial Officer of AnaptysBio, Inc., a biopharmaceutical company, from 2015 until 2016. In 1997, he was part of the founding management team of Arena Pharmaceuticals, Inc., a biopharmaceutical company, ultimately serving as Senior Vice President, Finance and Chief Financial Officer until March 2011, and then again from August 2011 until July 2015. From March 2011 to August 2011, Mr. Hoffman served as Chief Financial Officer of Polaris Group, a biopharmaceutical company. Mr. Hoffman is a member of the board of directors of Kura Oncology, Inc., a biopharmaceutical company, DelMar Pharmaceuticals, Inc., a biopharmaceutical company and ASLAN Pharmaceuticals, Inc., a biotechnology company. Previously, Mr. Hoffman was a member of the board of directors of Combimatrix Corporation, a molecular diagnostics company, from July 2013 to November 2017, and MabVax Therapeutics Holdings, Inc., a biopharmaceutical company, from September 2014 to June 2017. He also is a member of the Financial Accounting Standards Board’s Small Business Advisory Committee and is a member of the steering committee of the Association of Bioscience Financial Officers. Mr. Hoffman received his B.B.A. from St. Bonaventure University and is licensed as a C.P.A. (inactive) in the State of California.

We believe Mr. Hoffman is able to make valuable contributions to the board of directors due to his vast experience in finance and accounting and is qualified as a result of his general business experience and his status as an audit committee financial expert.

Raymond Tabibiazar, M.D., Director

Dr. Tabibiazar has served as a member of the board of directors since the Merger was completed on October 12, 2018. Dr. Tabibiazar is Private Aravive’s founder and served as the Chairman of Private Aravive’s board of directors and as Private Aravive’s President and Chief Executive Officer from its inception in 2007 to April 2017 and as Executive Chairman since May 2017. In addition to his role at Private Aravive, since April 2010 Dr. Tabibiazar also is the Managing Director of 525 Ventures, a life sciences strategic consulting company working with both public and private biopharmaceutical firms. Dr. Tabibiazar also served from October 2018 until April 2019 as Senior Vice President of Twist Bioscience, Inc., a Nasdaq-listed public company that manufactures synthetic DNA for clients in the biotechnology industry and from January 2016 until October 2018 as an advisor to Twist Bioscience, Inc. Prior to founding Private Aravive, Dr. Tabibiazar was a Venture Partner at Bay City Capital LLC, a large venture capital firm in the Bay Area. Prior to that, Dr. Tabibiazar served as the Chief Scientific Officer of Aviir, Inc., a molecular diagnostic company, as well as Vice President of Translational Research of VIA Pharmaceuticals, Inc., a cardiometabolic therapeutic company. Before moving to industry, Dr. Tabibiazar was a practicing cardiologist and an adjunct clinical instructor in medicine at Stanford University. Dr. Tabibiazar received his medical degree from Harvard Medical School and trained as an internist and cardiologist at Stanford University, while also receiving finance education at Stanford Business School. Dr. Tabibiazar received board certifications in Internal Medicine, Cardiovascular Medicine, Nuclear Medicine, and Cardiovascular Imaging.

We believe that Dr. Tabibiazar is able to make valuable contributions to the board of directors due to his clinical and leadership experience in the healthcare and pharmaceutical industries.

Eric Zhang, Director

Mr. Zhang has served as a member of the board of directors since the Merger was completed on October 12, 2018. Prior to the closing date of the Merger, he also served as a member of the board of directors of Private Aravive from June 2016 to October 2018. Mr. Zhang is the Managing Partner of New Era Technologies Management Ltd., a company he founded in 2016, which is a multi-strategy investor in biotechnology and applied physical sciences companies. From 2013 until 2016, when he founded New Era Technologies Management Ltd, Mr. Zhang was the manager of his family office investments. Mr. Zhang joined J.P. Morgan's China Investment Banking team in Hong Kong in 2006. In the subsequent seven years, Mr. Zhang worked for Macquarie Capital and Barclays Capital in Hong Kong, responsible for covering clients in the healthcare and technology sectors in the Greater China region. Mr. Zhang received a Bachelor of Commerce and BA in Economics from Queen's University in Kingston, Canada.

We believe that Mr. Zhang is able to make valuable contributions to the board of directors due to his extensive experience as an investor in and director of our company and other biotechnology companies.

TERM AND NUMBER OF DIRECTORS

The board of directors currently consists of seven (7) directors and is divided into three classes. Each class serves for a term of three years, with the terms of office of the respective classes expiring in successive years. Directors in Class I (Dr. Akkaraju, Mr. Hoffman and Dr. Tabibiazar) will stand for election at the 2021 meeting of stockholders, directors in Class II (Mr. Shepard and Dr. Giaccia) will stand for election at the 2022 Annual Meeting and directors in Class III (Ms. Hemrajani and Mr. Zhang) will stand for election at the 2020 annual meeting of stockholders.

Vacancies on the board of directors may be filled only by persons elected by a majority of the remaining directors. A director elected by the board of directors to fill a vacancy in a class, including vacancies created by an increase in the number of directors, shall serve for the remainder of the full term of that class and until the director's successor is duly elected and qualified.

INFORMATION REGARDING THE BOARD OF DIRECTORS AND CORPORATE GOVERNANCE

Independence of the Board of Directors

Our common stock is listed on the Nasdaq Global Select Market or the Nasdaq. Under the Nasdaq listing standards, independent directors must comprise a majority of a listed company's board of directors and all members of the Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee must be independent. Audit Committee members must also satisfy the independence criteria set forth in Rule 10A-3 under the Exchange Act and Compensation Committee members must also satisfy the independence criteria set forth in Rule 10C-1 under the Exchange Act. Under the Nasdaq listing standards, a director will only qualify as an "independent director" if, in the opinion of that company's board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director.

In order to be considered to be independent for purposes of Rule 10A-3, a member of an Audit Committee of a listed company may not, other than in his or her capacity as a member of the Audit Committee, the board of directors, or any other board committee: (i) accept, directly or indirectly, any consulting, advisory or other compensatory fee from the listed company or any of its subsidiaries, or (ii) be an affiliated person of the listed company or any of its subsidiaries.

The board of directors undertook a review of the independence of the members of the board of directors and considered whether any director has a material relationship with our company that could compromise his or her ability to exercise independent judgment in carrying out his or her responsibilities. Based upon information requested from and provided by each director concerning their background, employment and affiliations, including family relationships, the board of directors has determined that all of our current directors, except Ms. Hemrajani, due to her current position as President and Chief Executive Officer of our company, and Mr. Shepard, due to his prior position as President and Chief Executive Officer of our company, is "independent" as that term is defined under the rules of Nasdaq. As a result, Dr. Akkaraju, Dr. Giaccia, Mr. Hoffman, Dr. Tabibiazar and Mr. Zhang are deemed to be "independent" as that term is defined under the rules of Nasdaq.

In making these determinations, the board of directors considered the current and prior relationships that each non-employee director has with our company and all other facts and circumstances the board of directors deemed relevant in determining their independence, including the beneficial ownership of capital stock by each non-employee director, and the transactions involving them described in Item 13 of this Amendment "Certain Relationships and Related-Party Transactions, Director Independence."

INFORMATION REGARDING COMMITTEES OF THE BOARD OF DIRECTORS

The board of directors has the authority to appoint committees to perform certain management and administration functions. As disclosed above, the board of directors has established an Audit Committee, a Compensation Committee and Nominating and Corporate Governance Committee. The board of directors may establish other committees to facilitate the management of our company's business. The composition and functions of each committee are described below. Members serve on these committees until their resignation or until otherwise determined by the board of directors.

All of the committees comply with all applicable requirements of the Sarbanes-Oxley Act of 2002, Nasdaq, and SEC, rules and regulations as further described below. The charters for each of these committees are available on our website at www.aravive.com. Information contained on or accessible through our website is not a part of this Annual Report on Form 10-K and the inclusion of such website address in this Annual Report on Form 10-K is an inactive textual reference only.

Committees of the Board of Directors

The table set forth below shows the directors who are currently members or Chairman of each of the Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee. From time to time, the board of directors may also establish *ad hoc* committees to address particular matters.

Name	Audit	Compensation	Nominating and Corporate Governance
Rekha Hemrajani*			
Jay P. Shepard***			
Srinivas Akkaraju, M.D., Ph.D.	X		X
Amato Giaccia, Ph.D.			X**
Robert E. Hoffman	X**	X	X
Raymond Tabibiazar, M.D.		X**	
Eric Zhang	X		

* Ms. Hemrajani joined the board of directors effective January 9, 2020 as a Class III member. She is not a member of any of the committees of the board of director.

** Committee Chairman

*** Mr. Shepard serves as the Chairman of the board of directors effective January 9, 2020 replacing Dr. Akkaraju.

Below is a description of each committee of the board of directors.

Audit Committee

Messr. Hoffman and Zhang and Dr. Akkaraju currently serve as members of the Audit Committee. The board of directors has determined that Messrs. Hoffman and Zhang and Dr. Akkaraju are each "independent" in accordance with the Nasdaq definition of independence. The board of directors has determined that each of Messrs. Hoffman and Zhang and Dr. Akkaraju has the related financial management expertise within the meaning of the Nasdaq rules, as well as all members of the Audit Committee are "financially literate" under the applicable rules and regulations of the SEC and Nasdaq.

The primary purpose of the Audit Committee is to act on behalf of the board of directors in fulfilling the board of directors' oversight responsibilities with respect to our corporate accounting and financial reporting processes, systems of internal control over financial reporting and audits of financial statements, as well as the quality and integrity of our financial statements and reports and the qualifications, independence and performance of the registered public accounting firm or firms engaged as our independent outside auditors for the purpose of preparing or issuing an audit report or performing audit services. Specific responsibilities of the Audit Committee include:

- evaluating the performance of and assessing the qualifications of the independent auditors;
- determining and approving the engagement of the independent auditors;
- determining whether to retain or terminate the existing independent auditors or to appoint and engage new independent auditors;
- reviewing and approving the retention of the independent auditors to perform any proposed permissible non-audit services;

- monitoring the rotation of partners of the independent auditors on our audit engagement team as required by law;
- reviewing and approving or rejecting transactions between us and any related persons;
- conferring with management and the independent auditors regarding the effectiveness of internal controls over financial reporting;
- establishing procedures, as required under applicable law, for the receipt, retention and treatment of complaints received by us regarding accounting, internal accounting controls or auditing matters and the confidential and anonymous submission by employees of concerns regarding questionable accounting or auditing matters; and
- meeting to review our annual audited financial statements and quarterly financial statements with management and the independent auditor.

The Audit Committee operates pursuant to a written charter adopted by the board of directors, which is available on our website at *www.aravive.com*. The charter describes in more detail the nature and scope of responsibilities of the Audit Committee.

Compensation Committee

Mr. Tabibiazar and Mr. Hoffman currently serve as members of the Compensation Committee, each of whom the board of directors has determined is independent in accordance Rule 10C-1 under the Exchange Act and the Nasdaq definition of independence and that each is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act.

The primary purpose of the Compensation Committee is to discharge the responsibilities of the board of directors to oversee compensation policies, plans and programs and to review and determine the compensation to be paid to the executive officers, directors and other senior management, as appropriate. Specific responsibilities of the Compensation Committee include:

- reviewing and approving, or recommending that the independent members of the board of directors approve, goals and objectives relevant to the compensation of executive officers, and evaluating performance in light of such goals and objectives, including reviewing and approving employment, severance, change in control provisions and other compensatory arrangements;
- reviewing and approving the compensation of the directors;
- overseeing the administration of equity incentive plans and approve grants and awards;
- reviewing and making recommendations to the board of directors regarding the adoption, amendment and termination of our equity incentive plans;
- assessing the independence of independent compensation consultants, legal counsel or other advisors to the committee, before retaining them;
- reviewing and discussing with management our disclosures regarding compensation for use in any annual reports on Form 10-K, registration statements or proxy statements, to the extent required by law or Nasdaq listing requirements;
- preparing and reviewing the Compensation Committee report on executive compensation included in our annual proxy statement, to the extent required by law and Nasdaq listing requirements;
- investigating any matter brought to the attention of the Compensation Committee within the scope of its duties, if in the judgment of the Compensation Committee, such investigation is appropriate; and
- reviewing and evaluating the performance of the Compensation Committee and the adequacy of its charter.

The Compensation Committee operates pursuant to a written charter adopted by the board of directors, which is available on our website at *www.aravive.com*. The charter describes in more detail the nature and scope of responsibilities of the Compensation Committee.

Nominating and Corporate Governance Committee

Drs. Akkaraju and Giaccia and Mr. Hoffman currently serve as members of the Nominating and Corporate Governance Committee, each of whom, the board of directors has determined is independent in accordance with the Nasdaq definition of independence. Specific responsibilities of the Nominating and Corporate Governance Committee include:

- identifying, evaluating and recommending to the board of directors, candidates for election to the board, and making recommendations regarding re-election of incumbent directors;
- considering recommendations and proposals submitted by stockholders in respect of board nominees, establishing policies in respect of such recommendations and proposals (including stockholder communications with the board of directors), and recommending any action to the board in respect of such stockholder recommendations and proposals;

- identifying, evaluating and recommending to the board of directors, candidates to serve on committees of the board of directors,
- assessing the performance of the board of directors; and
- developing, recommending to the board of directors and reviewing corporate governance principles, and periodically reviewing such principles, our code of business conduct and other governance principles and making recommendations to the board of directors in respect thereof.

The Nominating and Corporate Governance Committee operates pursuant to a written charter adopted by the board of directors, which is available on our website at *www.aravive.com*. The charter describes in more detail the nature and scope of responsibilities of the Nominating and Corporate Governance Committee.

Changes to Procedures for Recommending Nominees to the Board of Directors.

None.

Delinquent Section 16(a) Reports

Section 16(a) of the Exchange Act requires our directors and executive officers, and persons who own more than ten percent of a registered class of our equity securities, to file with the SEC initial reports of ownership and reports of changes in ownership of our common stock and our other equity securities. Officers, directors and greater than ten percent stockholders are required by SEC regulation to furnish us with copies of all Section 16(a) forms they file.

To our knowledge, based solely on a review of the copies of such reports furnished to us and written representations that no other reports were required, during the fiscal year ended December 31, 2019, all Section 16(a) filing requirements applicable to our officers, directors and greater than ten percent beneficial owners were complied with other than a filing of a Form 3 for Gail McIntyre upon her appointment as an executive officer that was filed one day late.

Code of Business Conduct and Ethics

We have adopted a code of conduct that applies to all officers, directors and employees, including those officers responsible for financial reporting. The full text of the code of conduct is posted on our website at *www.aravive.com*. If we make any substantive amendments to the code of conduct or grant any waiver from a provision of the code of conduct to any executive officer or director, we will promptly disclose the nature of the amendment or waiver on our website.

Item 11. Executive Compensation.

EXECUTIVE COMPENSATION

We are a "smaller reporting company" under Item 10 of Regulation S-K promulgated under the Exchange Act and the following compensation disclosure is intended to comply with the requirements applicable to smaller reporting companies. Although the rules allow us to provide less detail about our executive compensation program, the Compensation Committee is committed to providing the information necessary to help stockholders understand its executive compensation-related decisions. Accordingly, this section includes supplemental narratives that describe the 2019 executive compensation program for our named executive officers.

Named Executive Officers. The following individuals are our "named executive officers" for the year ended December 31, 2019:

- Jay Shepard, our former President and Chief Executive Officer;
- Vinay Shah, our Chief Financial Officer; and
- Gail McIntyre, our Chief Scientific Officer.

Oversight of Executive Compensation

The compensation of our named executive officers is determined and approved by our Compensation Committee without members of management or any of our named executive officers present.

We believe that in order to create value for our stockholders, it is critical to attract, motivate and retain key executive talent by providing competitive compensation packages. Accordingly, we design our executive compensation programs to:

- attract, motivate and retain executives with the skills and expertise to execute our business plans;
- reward those executives fairly over time for actions consistent with creating long-term stockholder value;

- align the interests of our executive officers with those of our stockholders;
- provide compensation packages that are competitive, reasonable and fair within the highly competitive life sciences market for talented individuals.

The Compensation Committee uses the services of an independent compensation consultant who is retained by, and reports directly to, the Compensation Committee to provide the Compensation Committee with an additional external perspective with respect to its evaluation of relevant market and industry practices. At the end of 2018, the Compensation Committee retained Compensia, as a third-party compensation consultant to assist the Compensation Committee in establishing overall compensation levels for 2019. Compensia conducted analyses and provided advice on, among other things, the appropriate peer group, executive compensation for our executive officers and compensation trends in the life sciences industry. The peer group was recommended by Compensia and chosen by the Compensation Committee in late 2018 based on the following parameters: biopharmaceutical companies that were developing oncology products, with a lead product in a similar phase of development (Phase 1 or 2 clinical trials) and market values generally between $25 million and $200 million. At the time we choose our peer group companies, our market value was under approximately $60 million and our headcount was under 20 employees.

SUMMARY COMPENSATION TABLE

The following table shows compensation awarded to or earned by our named executive officers, for the fiscal years ended December 31, 2019 and 2018.

Name and Principal Position	Year	Salary ($)	Bonus ($)(1)	Stock Award ($)(2)	Option Awards ($)(2)	Non-Equity Incentive Plan Compensation ($)(3)	All Other Compensation ($)(4)	Total ($)
Jay P. Shepard(5)								
Former President and Chief Executive Officer	2019	$ 506,763	—	—	$ 569,398	$ 231,250	$ 7,824	$ 1,315,235
	2018	$ 540,264	$ 270,000	—	—	—	$ 8,024	$ 818,288
Vinay Shah(6)								
Chief Financial Officer	2019	$ 335,000	—	—	$ 186,527	$ 123,950	$ 4,561	$ 650,038
	2018	$ 60,017	$ 50,985	—	—	—	$ 1,006	$ 112,008
Gail McIntyre(7)								
Chief Scientific Officer	2019	$ 325,000	—	—	$ 260,156	$ 120,250	$ 8,089	$ 713,495
	2018	$ 59,332	$ 40,788	—	—	—	$ 829	$ 100,949

(1) The bonus for Mr. Shepard in 2018 was a cash retention bonuses as awarded by the board of directors. The bonus for Mr. Shah and Dr. McIntyre in 2018 was a merit bonus for performance in 2018 that was paid in the first quarter of 2019.

(2) In accordance with SEC rules, this column reflects the aggregate fair value of the stock and option awards granted during the respective fiscal year computed as of their respective grant dates in accordance with Financial Accounting Standard Board Accounting Standards Codification Topic 718 for stock-based compensation transactions (ASC 718). The valuation assumptions used in determining such amounts are described in Note 2 and Note 8 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

(3) Amounts reported in the non-equity incentive compensation plan column represent awards earned based on the achievement of company goals for the fiscal year presented as determined by the Compensation Committee of the board of directors and was paid in the first quarter of 2020.

(4) All other compensation is primarily comprised of life insurance payments made by us.

(5) Mr. Shepard stepped down as our President and Chief Executive Officer effective January 9, 2020 and assumed the role of Chairman of the Board and Director.

(6) Mr. Shah became our Chief Financial Officer on October 12, 2018, when the Merger was completed. The Summary Compensation Table does not include the following compensation (i) salary of $195,119 paid to Mr. Shah by Private Aravive for services performed by Mr. Shah as Chief Financial Officer of Private Aravive during 2018 and (ii) $24,500, which is the grant fair value of stock options awarded to Mr. Shah by Private Aravive for services performed by Mr. Shah as Chief Financial Officer of Private Aravive during 2018.

(7) Dr. McIntyre became our Chief Scientific Officer on February 12, 2019. The Summary Compensation Table does not include the following compensation (i) salary of $213,443 paid to Dr. McIntyre by Private Aravive for services performed by Dr. McIntyre as Senior Vice President of Research and Development of Private Aravive during 2018 and (ii) $19,110, which is the grant fair value of stock options awarded to Dr. McIntyre by Private Aravive for services performed by Dr. McIntyre as Senior Vice President of Research and Development of Private Aravive during 2018.

NARRATIVE TO SUMMARY COMPENSATION TABLE

The three principal components of our executive compensation program for our named executive officers in 2019 were base salary, annual performance-based bonus and long-term equity compensation. Base salary provides financial stability and security through a fixed amount of cash for performing job responsibilities. Annual performance-based bonus and long-term equity incentive compensation are designed to reward achievement of the specific strategic goals that we believe will advance our business strategy and create long-term value for our stockholders.

Consistent with our goal of attracting, motivating and retaining a high-caliber executive team, our executive compensation program is designed to pay for performance. We utilize compensation elements that meaningfully align our named executive officer's interests with those of our stockholders to create long-term value. As such, a significant portion of our Chief Executive Officer's and other executive officers' compensation is "at risk", performance-based compensation, in the form of long-term equity awards and annual cash incentives that are only earned if we achieve measurable corporate metrics, as set forth in the table below.

Name	Fixed	"At Risk"	Annual Performance Bonus	Equity Incentives
Jay Shepard	39%	61%	18%	43%
Vinay Shah	52%	48%	19%	29%
Gail McIntyre	46%	54%	17%	37%

We do not have any formal policies for allocating compensation among salary, performance bonus awards and equity grants, short-term and long-term compensation or among cash and non-cash compensation. Instead, the Compensation Committee uses its judgment in determining a total compensation program for each named executive officer to recommend to the Board for its approval that is a mix of current, short-term and long-term incentive compensation, and cash and non-cash compensation, that it believes appropriate to achieve the goals of our executive compensation program and our corporate objectives.

Annual Base Salary

In February 2019 and January 2020, the Compensation Committee reviewed the base salaries for our named executive officers, the market data from Compensia, the scope of each executive's responsibilities, each executive's prior experience and internal pay equity. After such review, the named executive officers' 2019 and 2020 annual base salaries approved by the Compensation Committee were as follows:

Name	2019 Base Salary ($)	2020 Base Salary ($)
Jay Shepard	500,000	—
Vinay Shah	335,000	360,000
Gail McIntyre	325,000	360,000

Annual Performance-Based Bonus Opportunity

In addition to base salaries, our named executive officers are eligible to earn an annual performance-based cash bonus, which is designed to provide an appropriate incentive to our named executives to achieve defined annual corporate performance goals and to reward our executives for individual achievement towards these goals. The annual performance-based bonus each executive officer is eligible to receive is based on the individual's target bonus, as a percentage of base salary. The amount of the performance-based bonus, if any, an executive earns may vary from year to year based on the achievement of certain corporate performance goals recommended by the Compensation Committee and communicated to our named executive officers each year, prior to or shortly following the beginning of the year to which they relate.

The corporate goals typically relate to our annual company goals and various business accomplishments which vary from time to time depending on our overall strategic objectives. The Compensation Committee may, but need not, establish a specific weighting amongst various corporate goals. The proportional emphasis on each goal may vary from time to time depending on our overall strategic objectives and the Compensation Committee's and Board's subjective determination of which goals have more impact on our performance.

After the end of the year, the Compensation Committee approves the extent to which the corporate goals have been achieved, based on management's review and recommendation, however, our executives do not make recommendations with respect to their own achievement. Accordingly, whether or not any bonus is awarded is determined in the Compensation Committee's discretion. Bonuses are not earned or vested until they are awarded and paid. The Compensation Committee also considers any significant corporate events or other significant accomplishments that were not contemplated at the beginning of the performance period in determining the extent to which the strategic goals were satisfied, such as the circumstances surrounding the feasibility of a goal being achieved.

Pursuant to their employment agreements or offer letters, each named executive officer was eligible to earn a 2019 target bonus represented as a percentage of base salary as set forth below.

Name	Target Bonus Percent
Jay Shepard	50%
Vinay Shah	40%
Gail McIntyre	40%

For 2019, the corporate goals included securing additional financing, CPRIT compliance, obtaining analyst coverage, clinical milestones and hiring of an executive management team. In January 2020, after careful review, our Compensation Committee, concluded that we had achieved 92.5% of our corporate performance goals and therefore performance bonuses were paid based upon 92.5% of target bonuses.

2019 Performance-Based Awards

On January 22, 2020, the Compensation Committee approved 2019 bonus awards related to 2019 performance based on the level of attainment of the 2019 specified goals, Mr. Shepard was paid a 2019 performance bonus of $231,250, Mr. Shah was paid a 2019 performance bonus of $123,950 and Dr. McIntyre was paid a 2019 performance bonus of $120,250.

Long-Term Incentive Compensation

Equity incentives are a key component of our executive compensation program that the Compensation Committee believes motivate executive officers to achieve our business objectives by tying incentives to the appreciation of our common stock. During 2019, we granted equity awards in the form of stock options that vest over a four year period. Our long-term, equity-based incentive awards are designed to align the interests of our named executive officers and our other employees, non-employee directors and consultants with the interests of our shareholders. Because vesting is based on continued service, our equity-based incentives also encourage the retention of our named executive officers through the vesting period of the awards.

We use stock options as the primary incentive vehicle for long-term compensation to our named executive officers because they are able to profit from stock options only if our stock price increases relative to the stock option's exercise price. We generally provide initial grants in connection with the commencement of employment of our named executive officers as our Compensation Committee, determines appropriate. We also provide annual retention grants shortly following the end of each year. The size of awards made subsequent to the commencement of employment takes into account stock options already held by the individual.

In February 2019, the Compensation Committee awarded stock option grants to our named executive officers in conjunction with the Board's review of the 2019 corporate goals. Mr. Shepard, Mr. Shah and Dr. McIntyre were granted stock options to purchase 116,000 shares, 38,000 shares and 53,000 shares, respectively at an exercise price of $5.83 per share. The Compensation Committee considered the recent Merger and disparity between equity awards that had been granted to former Versartis employees and Private Aravive employees.

On January 22, 2020, the Compensation Committee approved additional stock option grants to each of Mr. Shah and Dr. McIntyre to purchase 34,826 shares and 48,583 shares of our common stock, respectively, at an exercise price of $10.84 per share.

Other Compensation

Health and Welfare Benefits

Our named executive officers are eligible to participate in all of our employee benefit plans, including our medical, dental, vision, group life and disability insurance plans, in each case on the same basis as other employees.

Employee benefit plans

Our named executive officers are eligible to participate in our employee benefit plans, including our medical, dental, vision, group life and accidental death and dismemberment insurance plans, in each case, on the same basis as all of our other employees. We maintain a 401(k) plan for the benefit of our eligible employees, including our named executive officers, as discussed in the section below entitled “401(k) plan.”

401(k) plan

All of our employees, including our named executive officers, are eligible to participate in our 401(k) Plan, which is a retirement savings defined contribution plan established in accordance with Section 401(a) of the Internal Revenue Code of 1986, as amended ("Code"). Pursuant to our 401(k) Plan, employees may elect to defer their eligible compensation into the plan on a pre-tax basis, up to the statutorily prescribed annual limit of $18,500 in 2018 (additional salary deferrals not to exceed $6,000 are available to those employees 50 years of age or older) and to have the amount of this reduction contributed to our 401(k) Plan. In general, eligible compensation for purposes of the 401(k) plan includes an employee’s wages, salaries, fees for professional services and other amounts received for personal services actually rendered in the course of employment with us, to the extent the amounts are included in gross income, and subject to certain adjustments and exclusions required under the Code. The 401(k) Plan currently does not offer the ability to invest in our securities.

None of our named executive officers participate in or have account balances in qualified or non-qualified defined benefit plans, non-qualified defined contribution plans or pension plans sponsored by us.

Pension benefits

We do not maintain any pension benefit plans.

Nonqualified deferred compensation

We do not maintain any nonqualified deferred compensation plans.

Employment Offer Letters, Severance and Change in Control Arrangements

We or Private Aravive have entered into employment offer letters with each of our named executive officers. The offer letters provide for “at will” employment and set forth the terms and conditions of employment, including annual base salary, target bonus opportunity, equity compensation, severance benefits and eligibility to participate in our employee benefit plans and programs. Our named executive officers were each required to execute our standard proprietary information and inventions agreement. The material terms of these employment offer letters are summarized below. These summaries are qualified in their entirety by reference to the actual text of the offer letters, which are filed as exhibits attached.

Jay P. Shepard

We entered into an employment offer letter with Mr. Shepard on May 12, 2015. The offer letter originally provided that if terminated for any reason other than cause or permanent disability, Mr. Shepard would be eligible to receive certain severance benefits. If the termination is not in connection with a change in control, the severance benefits will include (i) up to 12 months of salary continuation and payment of health insurance coverage, (ii) 12 months accelerated vesting of the stock options and RSUs awarded to Mr. Shepard and (iii) up to 6 months post-termination to exercise any vested shares subject to such stock option. If terminated in connection with a change in control, severance benefits will be those specified under our equity incentive plan. Change in Control Severance Plan. On February 6, 2019, the Compensation Committee approved an amendment to the severance provisions of the offer letter entered into by Mr. Shepard to increase the time period for which (i) we will continue to pay his health insurance coverage under the Consolidated Omnibus Budget Reconciliation Act (“COBRA”) to eighteen months following his Separation (as defined in the offer letter) and (ii) he can exercise any vested options to purchase shares of common stock twelve months following his Separation from us. On February 28, 2019, the Compensation Committee approved an amendment to the offer letter entered into by Mr. Shepard, to set his annual salary at a rate of $500,000 with a target bonus equal to 50% of his annual base salary.

In addition, Mr. Shepard’s offer letter provided that upon a qualifying termination of employment, he would be entitled to certain severance payments and benefits, which are described below under “—Potential payments upon termination or change in control.”

In January 2020, Mr. Shepard resigned as our President and Chief Executive Officer pursuant to the terms of a separation agreement that we entered into with Mr. Shepard. Mr. Shepard will continue to serve the company as a consultant under the terms of a consulting agreement. See “Executive Compensation Actions After 2019-Jay Shepard.”

Vinay Shah

During the years ended December 31, 2018 and 2019, Mr. Shah's employment was at-will per the terms of an offer letter with Private Aravive dated February 1, 2017 as later amended on May 30, 2018 and February 6, 2019 pursuant to which he was entitled to receive an annual base salary of $335,000 for 2019,an annual target bonus of 40% of his base salary and six months' salary as severance in the event of certain terminations. Mr. Shah also entered into severance letters with Private Aravive that provide for twelve months' severance pay, twelve months payment of COBRA premiums and up to one year to exercise vested options if his employment was terminated within twelve months of the Merger due to a Qualifying Termination (as defined in the severance letter). Mr. Shah was granted options to purchase shares of Private Aravive common stock, each of which were fully vested and were converted into options to purchase 95,381 shares of our common stock at the effective time of the Merger.

In addition, Mr. Shah's offer letter provided that upon a qualifying termination of employment, he would be entitled to certain severance payments and benefits, which are described below under "—Potential payments upon termination or change in control."

Gail McIntyre

During the years ended December 31, 2018 and 2019, Dr. McIntyre's employment was at-will per the terms of an offer letter with Private Aravive, dated January 1, 2017, as amended February 6, 2019 e. Dr. McIntyre began work as a full-time employee of Private Aravive in January 2017 and was originally eligible to receive an annual salary of $264,000 and a bonus target of $39,600 and three months' salary as severance in the event of certain terminations. On February 6, 2019, the Compensation Committee approved an increase in Dr. McIntyre's annual base salary to $325,000 and her target bonus was increased to 40% of her annual base salary. In connection with Dr. McIntyre's employment by Private Aravive, Dr. McIntyre was granted options to purchase shares of Private Aravive common stock, each of which were fully vested and were converted into options to purchase 59,281 shares of our common stock at the effective time of the Merger. Dr. McIntyre also entered into severance letters with Private Aravive. that provides for twelve months' severance pay, twelve months payment of COBRA premiums and up to one year to exercise vested options if her employment is terminated within twelve months of the Merger due to a Qualifying Termination (as defined in the severance letter).

In addition, Dr. McIntyre's offer letter provided that upon a qualifying termination of employment, she would be entitled to certain severance payments and benefits, which are described below under "—Potential payments upon termination or change in control.

Executive Compensation Actions After 2019

Rekha Hermajani Offer Letter

Pursuant to the terms of our Offer Letter dated January 8, 2020 with Ms. Hemrajani, Ms. Hemrajani's compensation for services provided as our President and Chief Executive Officer includes: (i) an annual base salary of $475,000; (ii) an annual cash bonus targeted at 50% of her base salary, dependent on performance with respect to both corporate and individual goals, as determined by our board of directors; (iii) an option to purchase 143,000 shares of our common stock and (iv) restricted stock units ("RSUs") for 57,000 shares with each RSU representing the contingent right to receive, upon vesting of the RSU, one share of common stock. The stock options granted have an exercise price equal to the fair market value of the common stock on the date of the grant, expire ten years after the date of the grant and will vest as follows: 25% of the shares subject to the options will vest twelve months after the date of the grant, and the remaining 75% of the shares subject to the options will vest in equal monthly installments over the next 36 months following the one-year anniversary of the date of grant, subject to Ms. Hemrajani's continued service to our company. The RSUs will vest in four equal annual installments on the first, second, third and fourth anniversaries of the vesting commencement date. All compensation offered to Ms. Hemrajani is subject to applicable tax withholdings.

If terminated for any reason other than Cause or Permanent Disability (each as defined in the Offer Letter), Ms. Hemrajani will be eligible to receive certain severance benefits. If the termination is not in connection with a Change in Control (as defined in the Offer Letter), the severance benefits will include (i) up to 12 months of salary continuation and reimbursement of COBRA coverage, (ii) a pro-rated portion of her year-end target bonus contingent upon corporate goals being met, (iii) 12 months accelerated vesting of the stock options and RSUs awarded to Ms. Hemrajani and (iv) up to 9 months post-termination to exercise any vested shares subject to such stock option. If terminated in connection with a Change in Control, severance benefits will be those specified under the Company's 2019 Equity Incentive Plan and the Company's Change in Control Severance Plan the form of which was previously filed with the Securities and Exchange Commission (the "Severance Plan"), which provides specified severance benefits to certain eligible officers and employees of the Company. In addition, if during the twelve month period commencing on the closing date of a Change in Control the Company terminates her employment for any reason other than Cause or Permanent Disability, all unvested equity awards will immediately vest, subject to certain restrictions. In addition, under the 2019 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Ms. Hemrajani will be eligible for full accelerated vesting of her outstanding stock options and RSUs.

Jay P. Shepard Separation Agreement and Consulting Agreement

On January 9, 2020, Mr. Shepard transitioned to the role of Chairman of the Board of Directors and resigned as our President and Chief Executive Officer. On January 9, 2020, we entered into a separation agreement with Mr. Shepard and a consulting agreement with Mr. Shepard. The consulting agreement provides that, subject to execution of a release which is not revoked, in consideration for Mr. Shepard providing transition services to us, we agreed to pay Mr. Shepard (i) fifty percent of his base salary over a six month period, and (ii) reimbursement of six months of COBRA premiums during such period. As a member of our board of directors and a consultant, his equity awards will continue to vest. The separation agreement contains a non-disparagement obligation on both parties and a standard release of claims on the part of Mr. Shepard. On January 9, 2020 the Compensation Committee issued to Mr. Shepard an option to purchase 5,075 shares of our common stock in accordance with our director compensation policy for his transition to Chairman of the Board of Directors, which vests pro rata on a monthly basis over eight months commencing February 9, 2020 with full vesting, if not fully vested at such time, on the date of our next annual meeting of stockholders.

POTENTIAL PAYMENTS UPON TERMINATION OR CHANGE IN CONTROL

Severance benefits other than in connection with a change in control

Ms. Hemrajani

Ms. Hemrajani's offer letter provides that if we terminate her employment for any reason other than cause or permanent disability and not in connection with a change in control if Ms. Hemrajani (i) executes and does not revoke a release of claims within 60 days following the date she terminates employment with us, (ii) returns all of our property in her possession and (iii) resigns as a member of the board of directors, she will be entitled to (a) twelve months of salary continuation payments, (b) if she timely elects to continue his health insurance coverage under COBRA, we will pay a portion of her monthly COBRA premiums (at the same rate that we pay for active employees) for up to twelve months following the date she terminates employment with us (c) a pro-rated portion of her year-end target bonus contingent upon corporate goals being met, (d) 12 months accelerated vesting of the stock options and RSUs awarded to Ms. Hemrajani and (e) up to 9 months post-termination to exercise any vested shares subject to such stock option. In addition, if terminated in connection with a change of control, severance benefits will be those specified under our 2019 Equity Incentive Plan and our Change in Control Severance Plan (the "Severance Plan"), which provides for specified severance benefits to certain eligible officers and employees of our company. In addition, in accordance with the terms of her offer letter, if during the twelve month period commencing on the closing date of a Change in Control we terminate her employment for any reason other than Cause or Permanent Disability, all unvested equity awards will immediately vest, subject to certain restrictions. Ms. Hemrajani would receive a "Severance Multiplier" of 18 under the Severance Plan, which will entitle her to: cash severance equivalent to 18 multiplied by the sum of her monthly base salary and monthly annual bonus target; up to 18 months' payment of health insurance coverage and up to 18 months to exercise vested stock options. In addition, under the 2019 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Ms. Hemrajani would be eligible for full accelerated vesting of her outstanding stock options and RSUs.

Mr. Shah

On March 26, 2020, we entered into an offer letter with Mr. Shah that superseded the offer letter with private Aravive and provides that if we terminate his employment for any reason other than cause or permanent disability, or a qualifying termination and not in connection with a change in control, if Mr. Shah (i) executes and does not revoke a release of claims within 60 days following the date he terminates employment with us and, (ii) returns all of our property in his possession he will be entitled to (a) nine months of salary continuation payments (b) if he timely elects to continue his health insurance coverage under COBRA, we will pay a portion of his monthly COBRA premiums (at the same rate that we pay for active employees) for up to twelve months following the date he terminates employment with us. In addition, he will be entitled to (c) 12 months accelerated vesting of stock options and RSUs awarded to Mr. Shah and (d) up to 9 months post-termination to exercise any vested shares subject to such option. In addition, if terminated in connection with a change of control, severance benefits will be those specified under our 2019 Equity Incentive Plan and our Severance Plan, which provides for specified severance benefits to certain eligible officers and employees of our company. In addition, if during the twelve month period commencing on the closing date of a Change in Control we terminate his employment for any reason other than Cause, death or Disability or he resigns for Good Reason, pursuant to the Severance Plan, all unvested equity awards will immediately vest, subject to certain restriction. Mr. Shah would receive a "Severance Multiplier" of 12 under the Severance Plan, which will entitle him to: cash severance equivalent to 12 multiplied by the sum of his monthly base salary and monthly annual bonus target; up to 12 months' payment of health insurance coverage and up to 12 months to exercise vested stock options. In addition, under the 2019 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Mr. Shah would be eligible for full accelerated vesting of his outstanding stock options and RSUs.

Dr. McIntyre

On March 26, 2020, we entered into an offer letter with Dr. McIntyre that superseded the offer letter with private Aravive and provides that if we terminate her employment for any reason other than cause or permanent disability, or a qualifying termination and not in connection with a change in control, if Dr. McIntyre (i) executes and does not revoke a release of claims within 60 days following the date she terminates employment with us and (ii) returns all of our property in his possession she will be entitled to (a) nine months of salary continuation payments (b) if she timely elects to continue her health insurance coverage under COBRA, we will pay a portion of her monthly COBRA premiums (at the same rate that we pay for active employees) for up to twelve months following the date she terminates employment with us. In addition, she will be entitled to (c) 12 months accelerated vesting of stock options and RSUs awarded to Dr. McIntyre and (d) up to 9 months post-termination to exercise any vested shares subject to such option. In addition, if terminated in connection with a change of control, severance benefits will be those specified under our 2019 Equity Incentive Plan and our Change in Control Severance Plan, which provides for specified severance benefits to certain eligible officers and employees of our company. In addition, if during the twelve month period commencing on the closing date of a Change in Control we terminate her employment for any reason other than Cause or death or disability or she resigns for Good Reason, all unvested equity awards will immediately vest, subject to certain restriction. Dr. McIntyre would receive a "Severance Multiplier" of 12 under the Severance Plan, which will entitle her to: cash severance equivalent to 12 multiplied by the sum of her monthly base salary and monthly annual bonus target; up to 12 months' payment of health insurance coverage and up to 12 months to exercise vested stock options. In addition, under the 2019 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Dr. McIntyre would be eligible for full accelerated vesting of her outstanding stock options and RSUs.

Mr. Shepard

Mr. Shepard's offer letter that was in effect during 2019 provided that if terminated for any reason other than cause or death or disability or his resignation for Good Reason, Mr. Shepard would have been eligible to receive certain severance benefits. If the termination was not in connection with a change in control, the severance benefits would have included (i) up to 12 months of salary continuation and payment of health insurance coverage, (ii) 12 months accelerated vesting of the stock options and RSUs awarded to Mr. Shepard and (iii) up to 6 months post-termination to exercise any vested shares subject to such stock option. If terminated in connection with a change in control, severance benefits would have been those specified under our equity incentive plans and our Severance Plan, which provides specified severance benefits to certain eligible officers and employees of the Company. Mr. Shepard would have received a "Severance Multiplier" of 18 under the Severance Plan, which would have entitled him to: cash severance equivalent to 18 multiplied by the sum of his monthly base salary and monthly annual bonus target; up to 18 months' payment of health insurance coverage and up to 18 months to exercise vested stock options. In addition, under the 2014 Equity Incentive Plan, if involuntarily terminated in connection with certain corporate transactions, including a change in control, Mr. Shepard would have been eligible for full accelerated vesting of his outstanding stock options and RSUs.

Change in control severance benefit plan

We have adopted a change in control severance benefit plan, or the severance plan. The severance plan provides certain of our employees, including our currently employed Named Executive Officers, with severance payments and benefits upon certain qualifying terminations of employment within a one-year period following the closing of a change in control, as defined in the severance plan. The summary below is qualified by reference to the actual text of the severance plan, which is filed as an exhibit to the Form S-1, as amended, filed with the SEC on March 10, 2014.

Under the severance plan, in the event of a participant's involuntary termination without cause (and not due to death or disability) or if a participant resigns for good reason, if the participant in the severance plan (i) executes and does not revoke a release of claims within 60 days following the date he terminates employment with us and (ii) returns all of our property in his possession, he will be entitled to cash severance equal to the sum of his or her monthly base salary and monthly annual bonus target, multiplied by a severance multiplier, which is 15 in the case of the Chief Executive Officer and 12 in the case of the Chief Financial Officer and Chief Scientific Officer. In addition, following a qualifying termination, if a participant timely elects to continue his health insurance coverage under COBRA, we will pay a portion of his monthly COBRA premiums for a period of specified months following the date of termination.

All stock awards which are vested and exercisable as of the date of a qualifying termination under the severance plan (including by virtue of the provisions of the applicable equity plan) will remain outstanding and exercisable until the earliest to occur of (i) the last day of the applicable severance period, which is 15 months in the case of the Chief Executive Officer and 12 months in the case of the Chief Financial Officer and Chief Scientific Officer (ii) the expiration of the original term of such stock awards.

If one of our named executive officers is entitled to severance benefits under the severance plan by virtue of a qualifying termination of employment within 12 months following a change in control, he would not be entitled to severance benefits under the terms of his offer letter.

In addition, the severance plan provides that, except as otherwise expressly provided in an agreement between us and a participant, if any payment or benefit a participant would receive in connection with a change in control would constitute a "parachute payment" within the meaning of Section 280G of the Internal Revenue Code and such payment or benefit would be subject to the excise tax imposed by Section 4999 of the Internal Revenue Code, then such payment or benefit will be equal to either (i) the largest portion of the change in control payment that would result in no portion of the payment or benefit being subject to the excise tax, or (ii) the largest portion, up to and including the total payment or benefit, whichever amount, after taking into account all applicable taxes, including the excise tax (all computed at the highest applicable marginal rate), would result in the participant's receipt, on an after-tax basis, of the greatest economic benefit to the participant, notwithstanding that all or some portion of the payment or benefit may be subject to the excise tax. If a reduction is so required, the reduction will occur in the order specified in the severance plan.

OUTSTANDING EQUITY AWARDS AT FISCAL YEAR END

The following table shows for the fiscal year ended December 31, 2019, certain information regarding outstanding equity awards at fiscal year-end for the Named Executive Officers. Each award issued to Mr. Shepard, Mr. Shah, and Dr. McIntyre set forth below is subject to accelerated vesting upon a qualifying termination of his employment, as described under "—Potential Payments Upon Termination or Change in Control."

OUTSTANDING EQUITY AWARDS AT DECEMBER 31, 2019

		Option Awards(1)(2)				Stock Awards(1)	
Name	Grant Date	Number of Securities Underlying Unexercised options (#) exercisable	Number of Securities Underlying Unexercised options (#) unexercisable	Option Exercise Price ($)	Option Expiration Date	Number of shares or units of stock that have not vested (#)	Market value of shares or units of stock that have not vested (#)
Jay P. Shepard	12/28/2013(2)	13,148	—	$ 15.18	12/27/2023	—	—
	2/19/2014 (2)	7,563	—	$ 48.99	2/18/2024	—	—
	5/11/2015(2)	51,500	—	$ 91.14	5/10/2025	—	—
	1/28/2016(5)	34,139	727	$ 64.08	1/27/2026	—	—
	1/28/2016(4)	—	—	—	—	2,700	$ 36,909
	1/27/2017(6)	17,609	6,541	$ 85.80	1/26/2027	—	—
	1/27/2017(3)	—	—	—	—	556	$ 7,601
	1/27/2017(4)	—	—	—	—	5,392	$ 73,709
	12/20/2017(4)	—	—	—	—	18,582	$ 254,016
	02/28/2019(2)	24,166	91,834	$ 5.83	2/27/2029	—	—
Vinay Shah	10/01/2014(7)	19,380	—	$ 0.24	9/30/2024	—	—
	6/15/2017(7)	38,001	—	$ 0.66	6/14/2027	—	—
	12/14/2017(7)	19,000	—	$ 0.90	12/13/2027	—	—
	3/20/2018(7)	19,000	—	$ 0.90	3/19/2028	—	—
	2/28/2019(2)	7,916	30,084	$ 5.83	2/27/2029	—	—
Gail McIntyre	6/15/2017(7)	29,641	—	$ 0.66	6/14/2027	—	—
	12/14/2017(7)	14,820	—	$ 0.90	12/13/2027	—	—
	3/20/2018(7)	14,820	—	$ 0.90	3/19/2028	—	—
	2/28/2019(2)	11,041	41,959	$ 5.83	2/27/2029	—	—

(1) Except as otherwise indicated, vesting of all options and RSU's is subject to continued service on the applicable vesting date.

(2) The shares subject to the stock options vest over a four-year period as follows: 25% of the shares underlying the options vest on the one-year anniversary of the vesting start date, and thereafter 1/48th of the shares vest each month.

(3) The shares subject to these restricted stock units vest according to the following schedules: one-third of the shares subject to the award vest on each of the first, second and third anniversaries of the grant date.

(4) The shares subject to these restricted stock units vest according to the following schedule: 25% of the shares vest on each of the first, second, third and fourth anniversaries of the grant date.

(5) 4/48th of the shares subject to the option became exercisable on May 28, 2016, and the balance of the shares vest and become exercisable monthly thereafter.

(6) 1/48th of the shares subject to the option become exercisable monthly measured from the date of the grant.

(7) The shares subject to these options vested in full upon the closing of the Merger and were assumed by us in the Merger

Treatment of stock awards under the 2019 Plan

The 2019 Plan, provides that in the event of certain corporate transactions, as defined in the 2019 Plan, the following provisions will apply to outstanding stock awards, unless otherwise provided in a stock award agreement or any other written agreement between us and a participant, or unless otherwise expressly provided by the board of directors at the time of grant of a stock award:

The surviving or acquiring corporation (or its parent) may assume, continue or substitute similar stock awards for outstanding stock awards under the 2019 Plan and any reacquisition or repurchase rights held by us may be assigned to the surviving or acquiring corporation (or its parent);

To the extent that outstanding stock awards are not so assumed, continued or substituted, the vesting and, if applicable, exercisability of any such stock awards held by participants whose continuous service has not terminated prior to the effective time of the corporate transaction will be accelerated in full to a date prior to the effective time of such corporate transaction (contingent upon the effectiveness of the corporate transaction), and such stock awards will terminate if not exercised (if applicable) at or prior to the effective time of such corporation transaction, and any reacquisition or repurchase rights held by us will lapse, contingent upon the effectiveness of such corporate transaction;

To the extent that outstanding stock awards are not so assumed, continued or substituted, the vesting and, if applicable, exercisability of any such stock awards held by participants whose continuous service has terminated prior to the effective time of the corporate transaction will not be accelerated and all unvested stock awards held by such participants will terminate if not exercised (if applicable) prior to the effective time of the corporate transaction, but any reacquisition or repurchase rights held by us may continue to be exercised notwithstanding such corporate transaction; or

To the extent a stock award will terminate if not exercised prior to the effective time of a corporate transaction, the board of directors may provide that the holder of the stock award may not exercise the stock award, but instead will receive a payment, in such form as may be determined by the board of directors, equal in value to the excess, if any, of the value of the property the participant would have received upon exercise of the stock award over any exercise price payable by such holder in connection with such exercise. In addition, any escrow, holdback, earn out or similar provisions in the definitive agreement for the corporate transaction may apply to such payment to the same extent and in the same manner as such provisions apply to the holders of common stock.

A stock award may be subject to additional acceleration of vesting and exercisability upon or after a change in control, as defined in the 2019 Plan, as may be provided in the stock award agreement for such stock award or in any other written agreement between us and a participant, but in the absence of such a provision, no such acceleration will occur.

For purposes of the 2019 Plan, a corporate transaction is generally the consummation of: (1) a sale of all or substantially all of our assets, (2) the sale or disposition of more than 50% of our outstanding securities, (3) a merger or consolidation where we do not survive the transaction, or (4) a merger or consolidation where we do survive the transaction but the shares of our common stock outstanding immediately before such transaction are converted or exchanged into other property by virtue of the transaction.

Treatment of stock awards under the 2014 Plan

The 2014 Plan, provides that in the event of certain corporate transactions, as defined in the 2014 Plan, the following provisions will apply to outstanding stock awards, unless otherwise provided in a stock award agreement or any other written agreement between us and a participant, or unless otherwise expressly provided by the board of directors at the time of grant of a stock award:

The surviving or acquiring corporation (or its parent) may assume, continue or substitute similar stock awards for outstanding stock awards under the 2014 Plan and any reacquisition or repurchase rights held by us may be assigned to the surviving or acquiring corporation (or its parent); provided, that if any such stock awards are so assumed, continued or substituted, if a participant incurs an involuntary termination on or within 12 months following the date of such corporate transaction, any unvested shares subject to such assumed, continued or substituted stock awards will vest in full as of the date of such termination;

To the extent that outstanding stock awards are not so assumed, continued or substituted, the vesting and, if applicable, exercisability of any such stock awards held by participants whose continuous service has not terminated prior to the effective time of the corporate transaction will be accelerated in full to a date prior to the effective time of such corporate transaction, and such stock awards will terminate if not exercised (if applicable) at or prior to the effective time of such corporation transaction, and any reacquisition or repurchase rights held by us will lapse, contingent upon the effectiveness of such corporate transaction;

To the extent that outstanding stock awards are not so assumed, continued or substituted, the vesting and, if applicable, exercisability of any such stock awards held by participants whose continuous service has terminated prior to the effective time of the corporate transaction will not be accelerated and all unvested stock awards held by such participants will terminate if not exercised (if applicable) prior to the effective time of the corporate transaction, but any reacquisition or repurchase rights held by us may continue to be exercised notwithstanding such corporate transaction; or

To the extent a stock award will terminate if not exercised prior to the effective time of a corporate transaction, the board of directors may provide that the holder of the stock award may not exercise the stock award, but instead will receive a payment, in such form as may be determined by the board of directors, equal in value to the excess, if any, of the value of the property the participant would have received upon exercise of the stock award over any exercise price payable by such holder in connection with such exercise.

A stock award may be subject to additional acceleration of vesting and exercisability upon or after a change in control, as defined in the 2014 Plan, as may be provided in the stock award agreement for such stock award or in any other written agreement between us and a participant, but in the absence of such a provision, no such acceleration will occur.

For purposes of the 2014 Plan, an involuntary termination generally means, during the 12 months following the closing of a corporate transaction or change in control, either (i) a termination of service other than for cause (as defined in the 2014 Plan) or (ii) a voluntary resignation following: a material diminution in the participant's base salary; a material diminution in the participant's authority, duties, position or responsibilities; a material diminution in the authority, duties, position or responsibilities of the participant's supervisor (including a requirement that a participant report to a corporate officer or employee instead of directly to the board of directors); a material diminution in the budget over which the participant retains authority; a relocation of the participant's principal place of work to a location more than 50 miles away from the principal place of work prior to the consummation of a corporate transaction or a change in control; or any other act or omission that constitutes a material breach by us of the 2014 Plan.

Treatment of stock options under the Aravive Biologics, Inc 2010 and 2017 Equity Incentive Plans

In connection with the Merger we assumed the Aravive Biologics, Inc. 2010 and 2017 Equity Incentive Plans. The Aravive Biologics, Inc. 2010 and 2017 Equity Incentive Plans provide that in the event of certain corporate transactions, as defined in the plans, the board of directors may take one or more of the following actions with respect to outstanding stock awards, unless otherwise provided in a stock award agreement or any other written agreement between us and a participant, or unless otherwise expressly provided by the board of directors at the time of grant of a stock award: each outstanding stock award may be assumed or continued or an equivalent stock award may be substituted by a successor corporation and any reacquisition or repurchase rights held by us in respect of common stock issued pursuant to prior stock awards may be assigned to the successor corporation. The plans also provide that in the event of a specified corporate transaction the board of directors may determine to accelerate the vesting, in whole or in part of a stock award, with such stock award becoming fully vested and exercisable prior to the corporate transaction arrange for the lapse of any reacquisition or repurchase rights held by us with respect to the stock award or cancel or arrange for the cancellation of a stock award in exchange for cash consideration. Any awards that have not been assumed, continued, substituted, or exercised prior to the corporate transaction will terminate at the closing of the transaction. All options issued under the Aravive Biologics, Inc 2010 and 2017 Equity Plans that were outstanding on the closing of the Merger vested upon the closing of the Merger.

DIRECTOR COMPENSATION

The board of directors reviews the compensation of our non-employee directors from time to time to ensure that the amount and form of such compensation reflects the practices of the competitive market. In January 2019, the board of directors evaluated a competitive market analysis prepared by the Compensation Committee's compensation consultant, Compensia, which assessed our then-current director compensation policy. This analysis examined how our director compensation levels, practices, and design features compared to the constituent members of our compensation peer group, which was the same peer group that the Compensation Committee used as a reference when setting executive compensation. Based on this analysis, as well as its consideration of our financial performance, general market conditions, and the interests of our stockholders, the board of directors determined at that time to maintain our non-employee director compensation policy at its then-current cash and equity compensation levels. These compensation levels were maintained throughout 2019.

The following table shows for the fiscal year ended December 31, 2019 certain information with respect to the compensation of all of our current and former non-employee directors:

DIRECTOR COMPENSATION FOR FISCAL 2019

Name	Fees Earned or Paid in Cash ($)	Option Awards ($)	Restricted Stock Awards ($)	Total ($)
Srinivas Akkaraju, M.D., Ph.D.	$ 70,000	$ 48,789	—	$ 118,789
Amato Giaccia, Ph.D	$ 50,000	$ 70,929	—	$ 120,929
Robert E. Hoffman	$ 63,500	$ 70,929	—	$ 134,429
Raymond Tabibiazar, M.D.	$ 48,750	$ 70,929	—	$ 119,679
Shahzad Malik, M.D.(1)	$ 48,750	$ 48,789	—	$ 97,539
Eric Zhang	$ 47,500	$ 70,929	—	$ 118,429

(1) The compensation earned is for our former director who resigned effective January 9, 2020.

The table below shows the aggregate number of option awards outstanding at fiscal year-end for each of our current and former non-employee directors.

Name	Number of Shares Subject to Outstanding Options as of December 31, 2019	Number of Shares Subject to Outstanding Stock Awards as of December 31, 2019
Srinivas Akkaraju, M.D., Ph.D.	23,457	—
Amato Giaccia, Ph.D	240,416	—
Robert E. Hoffman	19,688	—
Raymond Tabibiazar, M.D.	654,522	—
Shahzad Malik, M.D.	23,782	—
Eric Zhang	19,688	—

Amounts in the director compensation table above for Dr. Giaccia and Dr. Tabibiazar include options assumed by us in the Merger that were issued to such individuals by Private Aravive prior to the Merger.

NON-EMPLOYEE DIRECTOR COMPENSATION POLICY

Under our non-employee director compensation policy in effect during the year ended December 31, 2019, we paid each of our non-employee directors a cash retainer for service on the board of directors and for service on each committee on which the director is a member. The chairman of each committee receives an additional retainer for such service. These retainers are payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of such payment will be prorated for any portion of such quarter that the director is not serving on the board of directors.

The retainers paid to non-employee directors for service on the board of directors and for service on each committee of the board of directors on which the director was a member for the year ended December 31, 2019 are as follows:

	Member Annual Service Retainer	Chairman Annual Service Retainer	
Board	$ 40,000	$ 30,000	*
Audit Committee	$ 7,500	$ 15,000	
Compensation Committee	$ 5,000	$ 12,500	*
Nominating and Corporate Governance Committee	$ 3,500	$ 10,000	

* In January 2019, the policy was amended to reduce the annual compensation committee chairman service retainer to $12,500 and to cap the total compensation to be received by the chairperson or executive chairperson of the board of directors for services on the board of directors and all committees thereof at $70,000.

The board of directors reviews the compensation of our non-employee directors from time to time to ensure that the amount and form of such compensation reflects the practices of the competitive market. In January 2019, the board of directors evaluated a competitive market analysis prepared by the Compensation Committee's compensation consultant, Compensia, which assessed our then-current director compensation policy. This analysis examined how our director compensation levels, practices, and design features compared to the constituent members of our compensation peer group, which is the same peer group that we use as a reference when setting executive compensation. Based on this analysis, as well as its consideration of our financial performance, general market conditions, and the interests of our stockholders, the board of directors determined to amend our non-employee director compensation policy, effective January 3, 2019, to provide the cash compensation set forth above and the equity compensation described below.

On the date of each annual meeting of stockholders held, each non-employee director that continues to serve as a non-employee member on the board of directors will receive options to acquire 7,500 shares of common stock, vesting 1/12th per month with full vesting, if not fully vested at such time, on the date of our next annual meeting of stockholder. The exercise price of such options will equal the fair market value of our common stock on the date of grant. For any new non-employee director who joins the board of director at a time other than at the annual stockholder meeting, then, in addition to the new non-employee director grants, such directors will receive an option to purchase shares of common stock, such number of shares of common stock equity equal to the product of 7,500 and a fraction with (i) a numerator equal to the number of days between the date of the director's initial election or appointment to the board of directors and the date which is the first anniversary of the date of the most recent annual stockholder meeting occurring before the director is elected or appointed to the board of directors, and (ii) a denominator equal to 365. In each case, vesting of the award is subject to the director's continuous service on each vesting date. This policy is intended to provide a total

compensation package that enables us to attract and retain qualified and experienced individuals to serve as directors and to align our directors' interests with those of our stockholders in accordance with the terms policy. In January 2019 we issued an option to (i) each of Dr. Giaccia, Mr. Hoffman, Dr. Tabibiazar, and Mr. Zhang to purchase 7,500 shares of our common stock, and (ii) to each Dr. Akkaraju, Dr. Giaccia, Mr. Hoffman, Dr. Malik, Dr. Tabibiazar and Mr. Zhang to purchase 4,688 shares of our common stock. In accordance with our policy, on September 12, 2019, immediately after our annual meeting of stockholders, we issued to each of Dr. Akkaraju, Dr. Giaccia, Mr. Hoffman, Dr. Malik, Dr. Tabibiazar and Mr. Zhang an option to purchase 7,500 shares of our common stock. On January 9, 2020 the Compensation Committee issued to Mr. Shepard an option to purchase 5,075 shares of our common stock in accordance with our director compensation policy for his transition to Chairman of the Board of Directors, which vests pro rata on a monthly basis over eight months commencing February 9, 2020 with full vesting, if not fully vested at such time, on the date of our next annual meeting of stockholders.

Directors have been and will continue to be reimbursed for expenses directly related to their activities as directors, including attendance at board and committee meetings. Directors are also entitled to the protection provided by their indemnification agreements and the indemnification provisions in our certificate of incorporation and bylaws.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

SECURITY OWNERSHIP OF
CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth certain information regarding the beneficial ownership of our common stock as of March 16, 2020 by: (i) each director; (ii) each of the executive officers named in the Summary Compensation Table; (iii) all executive officers and directors of the Company as a group; and (iv) all those known by us to be beneficial owners of more than five percent of its common stock.

	Beneficial Ownership(1)	
Beneficial Owner	**Number of Shares**	**Percent of Total**
Greater than 5% stockholders other than executive officers and directors:		
New Leaf Biopharma Opportunities II, L.P. and affiliated entities(2)	946,423	6.3%
BC Axis Limited, as controlled by 3E Biosciences Capital LP(3)	859,766	5.7%
Invus Public Equities, L.P and its affiliated entities(4)	1,350,000	9.0%
Named Executive officers and directors:		
Jay P. Shepard(5)	249,705	1.6%
Rekha Hemrajani	—	*
Vinay Shah(6)	288,078	1.9%
Gail McIntyre, Ph.D.(7)	78,607	*
Srinivas Akkaraju, M.D., Ph.D.(8)(9)	628,838	4.2%
Amato Giaccia, Ph.D.(10)	1,176,254	7.7%
Robert E. Hoffman(11)	13,646	*
Raymond Tabibiazar, M.D.(12)	1,649,231	10.5%
Eric Zhang(13)(14)	873,412	5.8%
All executive officers and directors as a group (9 persons)(15)	4,957,771	30.4%

* Represents beneficial ownership of less than one percent (1%) of the outstanding common stock.

(1) This table is based upon information supplied by officers, directors and principal stockholders and Schedules 13D and 13G filed with the SEC. Unless otherwise indicated in the footnotes to this table and subject to community property laws where applicable, we believe that each of the stockholders named in this table has sole voting and investment power with respect to the shares indicated as beneficially owned. Applicable percentages are based on 15,015,932 shares outstanding on March 16, 2020, adjusted as required by rules promulgated by the SEC. Beneficial ownership of shares is determined in accordance with the rules of the SEC and includes voting and investment power with respect to the shares. Shares of common stock subject to outstanding options that are exercisable within 60 days of March 16, 2020 are deemed outstanding for computing the percentage of ownership of the person holding such options. Unless otherwise indicated, the address of each beneficial owner listed in the table below is c/o Aravive, Inc., River Oaks Tower, 3730 Kirby Drive, Suite 1200, Houston, Texas 77098.

(2) Information is based upon a Schedule 13G/A (Amendment No. 2) filed with the SEC on February 13, 2020 (the "Schedule 13G/A") by New Leaf Biopharma Opportunities II, L.P. ("Biopharma II"), New Leaf BPO Associates II, L.P. ("NLBA II"), New Leaf BPO Management II, L.L.C. ("NLB Management II"), Ronald M. Hunt and Vijay K. Lathi. All 946,423 shares are owned by Biopharma II; except that NLBA II, the sole general partner of Biopharma II, may be deemed to beneficially own, and have sole power to vote, such shares; (ii) NLB Management II, the sole general partner of NLBA II and ultimate general partner of Biopharma II, may be deemed to beneficially own, and have sole power to vote, such shares; and (iii) each of Ronald M. Hunt and Vijay K. Lathi, the individual managing directors of NLB Management II, may also be deemed to beneficially own, and have shared power to vote, such shares. Each of the entities and the individuals listed above disclaims beneficial ownership of such shares of common stock, except for the shares, if any, such entity or individual holds of record and to the extent of their pecuniary interest therein, if any. The address of the individuals and entities listed above is 420 Lexington Avenue, Suite 408, New York, NY 10170, except for Vijay Lathi whose address is New Leaf Venture Partners, 2730 Sand Hill Road, Suite 110, Menlo Park, CA 94025. We obtained the foregoing information regarding beneficial ownership of these shares solely from the Schedule 13G/A.

(3) Information is based upon a Schedule 13D filed with the SEC on October 22, 2018 by BC Axis Limited, as controlled by 3E Biosciences Capital LP and Karen Liu. Ms. Liu is a director of BC Axis Limited The address for BC Axis Limited, as controlled by 3E Biosciences Capital LP and Karen Liu. is c/o BC Axis Limited, Suite 701, Tower C; Tsinghua Science Park; No 1. Zhongguancun East Road; Hainan District, Beijing.

(4) Information is based upon a Schedule 13G filed with the SEC on December 10, 2019 by Invus Public Equities, L.P ("Invus Public Equities")., Invus Public Equities Advisors, LLC ("Invus PE Advisors"), Artal Treasury Limited ("Artal Treasury"),Artal International S.C.A ("Artal International"), Artal International Management S.A. ("Artal Management"), Artal Group S.A. ("Artal Group"), Wetsend S.A.("Westend"), Stichting Administratiekabntoor Westland ("Stichting")and Mr. Pascal Minne("Minne'). Invus Public Equities directly holds the 1,350,000 shares of common stock. Invus PE Advisors, as the general partner of Invus Public Equities, controls Invus Public Equities and accordingly may be deemed to beneficially own the shares held by Invus Public Equities. Artal Treasury, as the managing member of Invus PE Advisors, controls Invus PE Advisors, and accordingly may be deemed to beneficially own the shares held by Invus Public Equities. Artal International, as its Geneva branch is the sole stockholder of Artal Treasury, may be deemed to beneficially own the shares that Artal Treasury may be deemed to beneficially own. Artal International Management, as the managing partner of Artal International, controls Artal International and, accordingly, may be deemed to beneficially own the shares that Artal International may be deemed to beneficially own. Artal Group, as the parent company of Artal International Management, controls Artal International Management and, accordingly, may be deemed to beneficially own the shares that Artal International Management may be deemed to beneficially own. Westend, as the parent company of Artal Group, controls Artal Group and, accordingly, may be deemed to beneficially own the shares that Artal Group may be deemed to beneficially own. The Stichting, as the parent company of Westend, controls Westend and, accordingly, may be deemed to beneficially own the shares that Westend may be deemed to beneficially own. Mr. Minne, as the sole member of the board of the Stichting, controls the Stichting and, accordingly, may be deemed to beneficially own the shares that the Stichting may be deemed to beneficially The address for Invus Public Equities and Invus PE Advisors is 750 Lexington Avenue, 30th Floor, New York, New York 10022. The address for Artal Treasury is PO Box 265, Suite 6, borough House, Rue du Pre, St. Peter Port, Guernsey GYI 3QU. The address for Artal International, Artal International Management and Artal Group, Westend is Valley Park, 44, Rue de la Vallée, L-2661, Luxembourg. The address for Stichting is Ijsselburcht 3 NL-6825 BS Arnhem, The Netherlands. The address for Minne is Rue de l'Industrie 44, B-1000, Bruxelles, Belgium.

(5) Includes an aggregate of 163,068 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(6) Includes 108,640 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(7) Includes 77,775 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(8) Includes an aggregate of 20,957 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(9) Based on information set forth in a Schedule 13D filed with the SEC by entities affiliated with Samsara BioCapital GP, LLC on June 18, 2018 and Form 4 filed with the SEC by entities affiliated with Samsara BioCapital GPP, LLC on December 2, 2019, these shares include 576,066 shares held by Samsara BioCapital, L.P., or Samsara BioCapital. Dr. Srinivas Akkaraju, a member of the board of directors, is a managing member of Samsara BioCapital GP, LLC, the general partner of Samsara BioCapital. The managing member disclaims beneficial ownership of these shares except to the extent of the Reporting Person's pecuniary interest therein. The Address for Samsara BioCapital, L.P. is 565 Everett Avenue, Palo Alto, CA 94301.

(10) Includes 234,374 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(11) Includes 13,646 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(12) Includes 648,480 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(13) Includes 13,646 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020.

(14) Consists of 859,766 shares held by Elite Vantage Global Limited. The Address for Elite Vantage Global Limited is Suite 1807, 18/F, China Resources Building, 26 Harbor Road, Wan Chai, Hong Kong.

(15) Consists of 3,677,185 shares held by the directors and executive officers and an aggregate of 1,280,586 shares issuable pursuant to stock options exercisable within 60 days of March 16, 2020 and upon settlement of RSUs that vest within 60 days of March 16, 2020.

The following table presents information as of December 31, 2019 with respect to shares of our common stock that may be issued under our existing equity compensation plans, including the 2009 Stock Plan, 2014 Plan, the 2019 Plan and the 2014 Employee Stock Purchase Plan. We do not maintain any equity incentive plans that have not been approved by shareholders.

Equity Compensation Plan Information

Plan Category	Number of securities to be issued upon exercise of outstanding options (a)	Weighted-average exercise price of outstanding options (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity Compensation Plan approved by security holders (1)			
2009 Stock Plan	39,442	$ 30.52	—
2014 Equity Incentive Plan	576,121	$ 30.39	—
2014 Employee Stock Purchase Plan	—	—	221,908
2019 Equity Incentive Plan	45,000	$ 5.77	1,391,697
Total	660,563	$ 28.72	1,613,605

(1) This table does not present information regarding equity awards under the Aravive Biologics, Inc. 2010 Equity Incentive Plan and the Aravive Biologics, Inc. 2017 Equity Incentive Plan that were assumed by us in connection with the Merger. As of December 31, 2019, an additional 1,159,597 shares of our common stock were subject to options outstanding that were assumed in the Merger.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

TRANSACTIONS WITH RELATED PERSONS

RELATED-PERSON TRANSACTIONS POLICY AND PROCEDURES

In 2014, we adopted a written Related-Person Transactions Policy that sets forth our policies and procedures regarding the identification, review, consideration and approval or ratification of "related-persons transactions." For purposes of our policy only, a "related-person transaction" is a transaction, arrangement or relationship (or any series of similar transactions, arrangements or relationships) in which we and any "related person" are participants involving an amount that exceeds $100,000. Transactions involving compensation for services provided to us as an employee, director, consultant or similar capacity by a related person are not covered by this policy. A related person is any executive officer, director, or more than 5% stockholder of our company, including any of their immediate family members, and any entity owned or controlled by such persons.

Under the policy, where a transaction has been identified as a related-person transaction, management must present information regarding the proposed related-person transaction to the Audit Committee (or, where Audit Committee approval would be inappropriate, to another independent body of the board of directors) for consideration and approval or ratification. The presentation must include a description of, among other things, the material facts, the interests, direct and indirect, of the related persons, the benefits to us of the transaction and whether any alternative transactions were available. To identify related-person transactions in advance, we rely on information supplied by its executive officers, directors and certain significant stockholders. In considering related-person transactions, the Audit Committee takes into account the relevant available facts and circumstances including, but not limited to (i) the risks, costs and benefits to us, (ii) the impact on a director's independence in the event the related person is a director, immediate family member of a director or an entity with which a director is affiliated, (iii) the terms of the transaction, (iv) the availability of other sources for comparable services or products and (v) the terms available to or from, as the case may be, unrelated third parties or to or from employees generally. In the event a director has an interest in the proposed transaction, the director must recuse himself or herself form the deliberations and approval. The policy requires that, in determining whether to approve, ratify or reject a related-person transaction, the Audit Committee consider, in light of known circumstances, whether the transaction is in, or is not inconsistent with, the best interests of us and our stockholders, as the Audit Committee determines in the good faith exercise of its discretion.

CERTAIN RELATED-PERSON TRANSACTIONS

The following is a summary of transactions since January 1, 2018 and all currently proposed transactions, to which we have been a participant, in which:

- the amounts exceeded or will exceed $120,000; and
- any of the directors, executive officers or holders of more than 5% of the respective capital stock, or any member of the immediate family of the foregoing persons, had or will have a direct or indirect material interest.

On December 2, 2019, Samsara BioCapital LP, invested approximately $1,000,000 in our public offering and acquired 133,333 shares in the offering. Dr. Akkaraju has been a managing member of Samsara BioCapital GP, LLC, the general partner of Samsara BioCapital LP. an affiliate of Srini Akkaraju.

Since January 1, 2018, there have been no transactions other than compensation arrangements which are described under “Executive Compensation” and “Director Compensation” and the entry into our standard form of indemnification agreements described below with directors and executive officers, and there are no proposed transactions, in which the amount involved exceeds $120,000 to which we or any of any of our subsidiaries was (or is to be) a party and in which any director, director nominee, executive officer, holder of more than 5% of our capital stock, or any immediate family member of or person sharing the household with any of these individuals, had (or will have) a direct or indirect material interest.

Indemnification agreements

Our amended and restated certificate of incorporation contains provisions limiting the liability of directors and our amended and restated bylaws provide that we will indemnify each of our directors to the fullest extent permitted under Delaware law. Our amended and restated certificate of incorporation and amended and restated bylaws also provide the board of directors with discretion to indemnify our officers and employees when determined appropriate by the board. In addition, we have entered and expect to continue to enter into agreements to indemnify our directors and executive officers.

Independence of the Board of Directors

The board of directors undertook a review of the independence of the members of the board of directors and considered whether any director has a material relationship with our company that could compromise his or her ability to exercise independent judgment in carrying out his or her responsibilities. Based upon information requested from and provided by each director concerning their background, employment and affiliations, including family relationships, the board of directors has determined that all of our current directors, except Mr. Shepard, due to his position as President and Chief Executive Officer of our company, is “independent” as that term is defined under the rules of Nasdaq. As a result, Dr. Akkaraju, Dr. Giaccia, Mr. Hoffman, Dr. Tabibiazar, and Mr. Zhang are deemed to be “independent” as that term is defined under the rules of Nasdaq. See the section of this Annual Report on Form 10-K entitled “Item 10. Directors, Executive Officers and Corporate Governance— Independence of the Board of Directors.”

Item 14. Principal Accounting Fees and Services.

PRINCIPAL ACCOUNTANT FEES AND SERVICES

On November 29, 2018, we dismissed PwC as our independent registered public accounting firm, and we retained BDO USA, LLP (“BDO USA”) as our new independent registered public accounting firm responsible for auditing our financial statements. The following table sets forth the aggregate fees incurred by us for audit and other services rendered by BDO USA during the year ended December 31, 2019 and November 30, 2018 until December 31, 2018:

	Fiscal Year Ended	
	2019	2018
	(in thousands)	
Audit Fees(1)	$ 254	$ 254
Audit-Related Fees(2)	—	—
Tax Fees(3)	54	—
All Other Fees(4)	—	—
Total Fees	$ 308	$ 254

(1) Audit fees consist of fees billed for professional services rendered for the audit of our consolidated annual financial statements, review of the interim consolidated financial statements, the issuance of consent and comfort letters in connection with registration statement filings with the SEC and all services that are normally provided by the accounting firm in connection with statutory and regulatory filings or engagements.

(2) None.

(3) Tax fees include fees billed in the fiscal periods shown for professional services for tax compliance.

(4) None.

All fees described above were pre-approved by the Audit Committee.

Pre-Approval Policies and Procedures

The Audit Committee has adopted a policy and procedures for the pre-approval of audit and non-audit services rendered by our independent registered public accounting firm. The policy generally pre-approves specified services in the defined categories of audit services, audit-related services and tax services up to specified amounts. Pre-approval may also be given as part of the Audit Committee's approval of the scope of the engagement of the independent auditor or on an individual, explicit, case-by-case basis before the independent auditor is engaged to provide each service. The pre-approval of services may be delegated to one or more of the Audit Committee's members, but the decision must be reported to the full Audit Committee at its next scheduled meeting.

The Audit Committee has determined that the rendering of non-audit services by BDO USA in 2019 and 2018 is compatible with maintaining the principal accountant's independence.

PART IV

Item 15. Exhibits, Financial Statement Schedule.

(1) Consolidated Financial Statements:

See Index to Consolidated Financial Statements at page F-1.

(2) Financial Statement Schedule:

All schedules are omitted because they are not required or the required information is included in the consolidated financial statements or notes thereto.

(3) Exhibits:

The exhibits listed in the accompanying index to exhibits are filed as part of, or incorporated by reference into, the 2019 Annual Report on Form 10-K.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Shareholders and Board of Directors
Aravive, Inc.
Houston, Texas

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Aravive, Inc. (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2019, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

Change in Accounting Principle

As discussed in Notes 2 and 5 to the consolidated financial statements, the Company changed its method of accounting for leases in the year ended December 31, 2019 upon adoption of Accounting Standards Codification (ASC) Topic 842, Leases, using the modified retrospective method.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, LLP

We have served as the Company's auditor since 2018.

Raleigh, North Carolina

March 27, 2020

ARAVIVE, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share amounts)

	December 31, 2019	December 31, 2018
Assets		
Current assets		
Cash and cash equivalents	$ 65,134	$ 56,992
Prepaid expenses and other current assets	3,079	1,038
Total current assets	68,213	58,030
Restricted cash	2,423	2,396
Property and equipment, net	1,808	32
Operating lease right-of-use assets	8,697	—
Build-to-suit lease asset, net	—	8,651
Intangible asset, net	219	341
Other assets	761	20
Total assets	$ 82,121	$ 69,470
Liabilities and stockholders' equity		
Current liabilities		
Accounts payable	$ 1,078	$ 426
Accrued liabilities	1,497	1,365
Operating lease obligation, current portion	2,393	—
Deferred revenue	—	146
Total current liabilities	4,968	1,937
Contingent payable	264	264
Operating lease obligation	7,840	—
Build-to-suit lease obligation	—	7,324
Total liabilities	13,072	9,525
Commitments and contingencies		
Stockholders' equity		
Preferred stock, $0.0001 par value, 5,000,000 shares authorized at December 31, 2019 and December 31, 2018; zero shares issued and outstanding at December 31, 2019 and December 31, 2018	—	—
Common stock, $0.0001 par value, 100,000,000 shares authorized at December 31, 2019 and December 31, 2018; 15,001,795 and 11,266,151 shares issued and outstanding at December 31, 2019 and December 31, 2018, respectively	2	1
Additional paid-in capital	539,158	510,509
Accumulated deficit	(470,111)	(450,565)
Total stockholders' equity	69,049	59,945
Total liabilities and stockholders’ equity	$ 82,121	$ 69,470

The accompanying notes are an integral part of these consolidated financial statements.

ARAVIVE, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except per share amounts)

	Year Ended December 31,	
	2019	**2018**
Revenue		
Grant revenue	$ 4,753	$ 1,371
Total revenue	4,753	1,371
Operating expenses		
Research and development	12,836	11,075
Write-off of acquired in-process research and development	—	38,313
General and administrative	13,691	27,395
Total operating expenses	26,527	76,783
Loss from operations	(21,774)	(75,412)
Interest income	1,022	989
Interest expense	—	(2,429)
Other income (expense), net	2,534	519
Net loss	$ (18,218)	$ (76,333)
Net loss per share- basic and diluted	$ (1.57)	$ (10.64)
Weighted-average common shares used to compute net loss per share- basic and diluted	11,589	7,171

The accompanying notes are an integral part of these consolidated financial statement

ARAVIVE, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands, except share and per share amounts)

	Common Stock		Additional Paid-In Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount			
Balances at January 1, 2018	5,989,688	$ 1	$ 456,987	$ (374,232)	$ 82,756
Issuance of common stock upon exercise of options	3,643	—	35	—	35
Issuance of common stock under employee benefit plans	130,905	—	17	—	17
Stock-based compensation	—	—	16,139	—	16,139
Issuance of common stock for the merger transaction	5,141,915	—	37,331	—	37,331
Net loss	—	—	—	(76,333)	(76,333)
Balances at December 31, 2018	11,266,151	1	510,509	(450,565)	59,945
Issuance of common stock in public offering, net of issuance costs of $351	3,633,334	1	25,127	—	25,128
Cumulative-effect adjustment to equity due to adoption of ASU 2016-02	—	—	—	(1,328)	(1,328)
Issuance of common stock upon exercise of options	39,686	—	95	—	95
Issuance of common stock under employee benefit plans	62,624	—	28	—	28
Stock-based compensation	—	—	3,399	—	3,399
Net loss	—	—	—	(18,218)	(18,218)
Balances at December 31, 2019	15,001,795	$ 2	$ 539,158	$ (470,111)	$ 69,049

The accompanying notes are an integral part of these consolidated financial statements.

ARAVIVE, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,	
	2019	**2018**
Cash flows from operating activities		
Net loss	$ (18,218)	$ (76,333)
Adjustments to reconcile net loss to net cash used in operating activities		
Depreciation and amortization	498	1,060
Write-off of acquired in-process research & development	—	38,313
Stock-based compensation expense	3,399	16,139
Changes in assets and liabilities, net of acquisition		
Prepaid expenses and other assets	(2,782)	(224)
Accounts payable	652	(1,744)
Deferred revenue	(146)	(1,371)
Accrued and other liabilities	(484)	(5,097)
Net cash used in operating activities	(17,081)	(29,257)
Cash flows from investing activities		
Purchase of property and equipment	—	(33)
Cash paid to acquire in-process research & development	—	(2,076)
Cash acquired in the merger transaction	—	5,277
Net cash provided by investing activities	—	3,168
Cash flows from financing activities		
Inducement on build-to-suit lease obligation	—	1,896
Proceeds from issuance of common stock, net of issuance costs	25,127	—
Proceeds from issuance of common stock in connection with employee benefit plans and exercise of stock options	123	52
Net cash provided by financing activities	25,250	1,948
Net increase (decrease) in cash, cash equivalents and restricted cash	8,169	(24,141)
Cash, cash equivalents and restricted cash at beginning of period	59,388	83,529
Cash, cash equivalents and restricted cash at end of period	$ 67,557	$ 59,388
Supplemental disclosure of noncash items		
Issuance of common stock for the merger transaction	$ —	$ 37,331
Property and equipment recorded upon adoption of ASU 2016-02	$ 2,151	$ —

The accompanying notes are an integral part of these consolidated financial statements.

1. Formation and Business of the Company

Aravive, Inc. ("Aravive" or the "Company") was incorporated on December 10, 2008 in the State of Delaware. Aravive is a clinical-stage biopharmaceutical company developing treatments designed to halt the progression of life-threatening diseases, including cancer and fibrosis. Prior to the merger with Aravive Biologics, Inc. (the "Merger"), Aravive (then known as Versartis, Inc.) was an endocrine-focused biopharmaceutical company that was developing a long-acting recombinant human growth hormone for the treatment of growth hormone deficiency. The "Company" refers to Aravive as a combined company following the completion of the Merger with Aravive Biologics, Inc. ("Private Aravive"). The Merger became effective on October 12, 2018. On October 15, 2018, Versartis, Inc. changed its name to Aravive, Inc.

The Company's lead product candidate, AVB-500 (previously referred to as AVB-S6-500), is an ultrahigh-affinity, decoy protein that targets the GAS6-AXL signaling pathway by binding GAS6. By capturing serum GAS6, AVB-500 starves the AXL pathway of its signal, potentially halting the biological programming that promotes disease progression. AXL receptor signaling plays an important role in multiple types of malignancies by promoting metastasis, cancer cell survival, resistance to treatments, and immune suppression. The GAS6-AXL signaling pathway also plays a significant role in fibrogenesis.

The Company's current development program benefits from the availability of a proprietary serum-based biomarker that we expect will help accelerate drug development by allowing the Company to select a pharmacologically active dose.

In the Company's completed Phase 1 clinical trial with our clinical lead product candidate, AVB-500, the Company has demonstrated proof of mechanism for AVB-500 in neutralizing GAS6. Importantly, AVB-500 had a favorable safety profile preclinically and in the first in human trial in healthy volunteers. In December 2018, the Company initiated the Phase 1b portion of a Phase 1b/2 clinical trial of AVB-500 combined with standard of care therapies in patients with platinum-resistant ovarian cancer and are currently enrolling the expansion cohort in the Phase 1b. In August 2018, the U.S. Food and Drug Administration (FDA) granted fast track designation to AVB-500 for platinum-resistant recurrent ovarian cancer. In January 2020, the Company announced that the FDA has cleared our Investigational New Drug (IND) application for investigation of AVB-500, in the treatment of our second oncology indication, clear cell renal cell carcinoma (ccRCC).

As the Company advances its clinical programs, the Company is in close contact with its CROs and clinical sites and is assessing the impact of COVID-19 on its studies and current timelines and costs. With the recent and rapidly evolving impact of COVID-19 on patient recruitment in clinical trials and considering patient safety and trial integrity, Aravive has decided to amend its clear cell renal cell carcinoma (ccRCC) trial to initiate treatment at a higher dose given the safety profile seen with the 15 mg/kg dosing cohort of the platinum resistant ovarian cancer (PROC) trial and the initiation of the 20 mg/kg dosing cohort. While this may delay first patient dosing, the overall timelines may not be significantly impacted given the higher starting dose, assuming the COVID-19 situation does not interfere with ongoing clinical studies. The Company will pause new enrollment in its IgA nephropathy (IgAN) trial until the risk of unnecessary exposure of patients to COVID-19 is decreased.

In July 2016, Private Aravive was approved for a $20 million Product Development Award from the Cancer Prevention and Research Institute of Texas ("CPRIT Grant"). The CPRIT Grant was expected to allow Private Aravive to develop the product candidate referenced above through clinical trials. The CPRIT Grant was effective as of June 1, 2016 and terminated on November 30, 2019. Private Aravive's royalty and other obligations, including its obligation to repay the disbursed grant proceeds under certain circumstances, survive the termination of the agreement. The CPRIT Grant is subject to customary CPRIT funding conditions including a matching funds requirement where Private Aravive matched 50% of funding from the CPRIT Grant. Consequently, Private Aravive was required to raise $10.0 million in matching funds over the three-year project. Private Aravive has raised all its required $10.0 million in matching funds.

Private Aravive's award from CPRIT requires it to pay CPRIT a portion of its revenues from sales of certain products, or received from its licensees or sublicensees, at tiered percentages of revenue in the low- to mid-single digits until the aggregate amount of such payments equals 400% of the grant award proceeds, and thereafter at a rate of less than one percent for as long as Private Aravive maintains government exclusivity. In addition, the grant contract also contains a provision that provides for repayment to CPRIT of the full amount of the grant proceeds under certain specified circumstances involving relocation of Private Aravive's principal place of business outside Texas.

As consideration for the rights granted as part of a license agreement with Stanford University, Private Aravive is obligated to pay yearly license fees and milestone payments, and a royalty based on net sales of products covered by the patent-related rights. More specifically, Private Aravive is obligated to pay Stanford University (i) annual license payments (ii) milestone payments of up to an aggregate of $1,000,000 upon achievement of clinical and regulatory milestones, and (iii) royalties equal to a percentage (in the low single digits) of net sales of licensed products; provided that the annual license payments made will offset (and be credited against) any royalties due in such license year. In the event of a sublicense to a third party of any rights based on the patents that are solely owned by Stanford University, Private Aravive is obligated to pay royalties to Stanford University equal to a percentage of what Private Aravive would have been required to pay to Stanford University had it sold the products under sublicense itself. In addition, in such event it is required to pay to Stanford University a percent of sublicensing income. In the event of a termination, Private Aravive will be obligated to pay all amounts that accrued prior to such termination.

In connection with the completion of the Merger, on October 15, 2018, the amended and restated certificate of incorporation of the Company was amended to effect, at 12:01 a.m. Eastern Time on October 16, 2018, a reverse split of Company Common Stock at a ratio of 1-for-6 (the “Amended Certificate”).

All share and per share amounts in the consolidated financial statements have been retroactively adjusted for all periods presented to give effect to the reverse split, including reclassifying an amount equal to the reduction in par value to additional paid-in capital.

The Reverse Split affected all issued and outstanding shares of Common Stock, as well as Common Stock underlying stock options and restricted stock units outstanding immediately prior to the effectiveness of the Reverse Split.

2. Summary of Significant Accounting Policies

Basis of Presentation and Use of Estimates

The accompanying consolidated financial statements have been prepared in accordance with GAAP. The preparation of the accompanying consolidated financial statements in accordance with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the consolidated financial statements, and the reported amounts of expenses during the reporting period. Actual results could differ from those estimates.

The accompanying financial statements are consolidated for the years ended December 31, 2019 and 2018 and include the accounts of Aravive, Inc. and its wholly-owned subsidiaries, Versartis Cayman Holdings Company, incorporated in 2014, Versartis GmbH, incorporated in 2015 and Private Aravive, incorporated in 2007. After 2015, the Cayman and GmbH subsidiaries became dormant. In 2019, the Cayman and GmbH subsidiaries were liquidated in their respective countries and no longer exist as of December 31, 2019. All intercompany accounts and transactions have been eliminated. The U.S. dollar is the functional currency for all of the Company's subsidiaries and consolidated operations.

Liquidity and Capital Resources

Since inception, the Company has incurred net losses and negative cash flows from operations. At December 31, 2019, the Company had an accumulated deficit of $470.1 million and working capital of $63.3 million. Since inception, the Company has incurred net losses and negative cash flows from operations. The Company expects to continue to incur losses from costs related to the development of AVB-500 and related administrative activities for the foreseeable future. As of December 31, 2019, the Company had a cash and cash equivalents balance of $65.1 million consisting of cash and investments in highly liquid U.S. money market funds. While the Company believes that its existing cash and cash equivalents will be sufficient to sustain operations for at least the next 12 months from the issuance of these financial statements, based on its current business plan, the Company will need to obtain additional financing to advance our clinical development program to later stages of development and commercialize our clinical product candidate. Although management has been successful in raising capital in the past, there can be no assurance that the Company will be successful or that any needed financing will be available in the future at terms acceptable to the Company.

Correction of Quarterly Information

During the fourth quarter ended December 31, 2018, the Company determined that the amount related to the inducement on build-to-suit lease obligation as reflected within one line in the investing activities section of the unaudited consolidated statement of cash flows for the three-, six-, and nine-month periods ended March 31, 2018, June 30, 2018, and September 30, 2018, respectively, filed on Form 10-Q, should have been classified as cash flows provided from financing activities. There is no impact to the consolidated statements of operations and comprehensive loss or consolidated balance sheets for any of these periods. The Company evaluated the effect of this misclassification and concluded it was not material to any of its previously issued unaudited consolidated financial statements. Upon revision, cash flows from investing activities for the three-, six-, and nine-month periods ended March 31, 2018, June 30, 2018, and September 30, 2018, decreased by $1.5 million, $1.9 million, and $1.9 million, respectively and cash flows from financing activities for the respective periods increased by $1.5 million, $1.9 million, and $1.9 million, respectively. This adjustment had no impact to the Company's financial position, results of operations or cash flows as of and for the year ended December 31, 2018.

Segments

The Company operates in one segment. Management uses one measurement of profitability and does not segregate its business for internal reporting. All long-lived assets are maintained in the United States of America.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents. All of the Company's cash and cash equivalents are held at several financial institutions that management believes are of high credit quality. Such deposits may exceed federally insured limits.

Risk and Uncertainties

The Company's future results of operations involve a number of risks and uncertainties. Factors that could affect the Company's future operating results and cause actual results to vary materially from expectations include, but are not limited to, uncertainty of results of clinical trials and reaching milestones, uncertainty of regulatory approval of the Company's potential drug candidates, uncertainty of market acceptance of the Company's products, competition from substitute products and larger companies, securing and protecting proprietary technology, strategic relationships and dependence on key individuals and sole source suppliers.

Products developed by the Company require clearances from the U.S. Food and Drug Administration ("FDA"), the Pharmaceuticals Medicines and Devices Agency ("PMDA"), or other international regulatory agencies prior to commercial sales. There can be no assurance that the products will receive the necessary clearances. If the Company is denied clearance, clearance is delayed or the Company is unable to maintain clearance, it could have a material adverse impact on the Company.

The Company expects to incur substantial operating losses for the next several years and will need to obtain additional financing in order to launch and commercialize any product candidates for which it receives regulatory approval.

Cash and Cash Equivalents, Restricted Cash

The Company considers all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents. At December 31, 2019 and 2018 the Company's cash and cash equivalents were held in multiple institutions within the United States and included deposits in money market funds which were unrestricted as to withdrawal or use. Restricted cash consists of a letter of credit to secure the Company's obligations under the right-of-use lease.

Property and Equipment, Net

Property and equipment are stated at cost and depreciated using the straight-line method over the estimated useful lives of the assets, generally between three and five years. Leasehold improvements are amortized on a straight-line basis over the lesser of their useful life or the term of the lease. Maintenance and repairs are charged to expense as incurred, and improvements are capitalized. When assets are retired or otherwise disposed of, the cost and accumulated depreciation are removed from the consolidated balance sheets and any resulting gain or loss is reflected in operations in the period realized.

Leases

The Company adopted ASC 842 on January 1, 2019. For the periods prior to January 1, 2019, the Company's leases were accounted for under ASC 840. The Company leases all of its office space in conducting its business. At inception, the Company determines whether an agreement represents a lease and at commencement the Company evaluates each lease agreement to determine whether the lease is an operating or financing lease. As described below under "Recent Accounting Pronouncements", the Company adopted the Financial Accounting Standards Board Accounting Standards Update, or ASU, "Leases," or ASU 2016-02. The Company elected to adopt the standard on January 1, 2019 using the alternative transition method provided by ASU 2018-11 whereby the Company recorded right-of-use ("ROU") assets and lease liabilities for its existing leases as of January 1, 2019, as well as a cumulative-effect adjustment to accumulated deficit of initially applying the new standard as of January 1, 2019.

The new standard provides a number of optional practical expedients in transition. The Company has elected the practical expedients to not reassess its prior conclusions about lease identification under the new standard, to not reassess lease classification, and to not reassess initial direct costs. The Company has elected the practical expedient allowing the use-of-hindsight which doesn't require the Company to reassess the lease term of its leases based on all facts and circumstances through the effective date.

The new guidance also provides practical expedients for ongoing lease accounting. The Company has elected the recognition exemption for short-term lease for all leases that qualify. Under this exemption, the Company will not recognize ROU assets or lease liabilities on the consolidated balance sheet for those leases that qualify as a short-term lease, which includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. The Company has also elected the practical expedient to not separate lease and non-lease components for all equipment and real-estate leases.

With the adoption of ASU 2016-02, the Company recorded an operating lease right-of-use asset and an operating lease obligation on the consolidated balance sheet. ROU assets represent the Company's ROU of the underlying asset for the lease term and the lease obligation represents the Company's commitment to make the lease payments arising from the lease. ROU obligations are recognized at the commencement date based on the present value of remaining lease payments over the lease term and ROU assets are calculated as the lease liability, adjusted by unamortized initial direct costs, unamortized lease incentives received, cumulative deferred or prepaid lease payments, and accumulated impairment losses. As the Company's leases do not provide an implicit rate, the Company has used an estimated incremental borrowing rate based on the information available at the adoption date in determining the present value of lease payments. The lease term may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Operating lease expense is recognized on a straight-line basis over the lease term, subject to any changes in the lease or expectations regarding the terms. Variable lease costs such as common area costs and property taxes are expensed as incurred. Variable lease costs and short-term lease payments not included in the lease liability are classified within operating activities in the consolidated statements of cash flows. For all lease agreements the Company has combined lease and nonlease components. Leases with an initial term of 12 months or less are not recorded on the consolidated balance sheet. These expenses are recognized within operating expenses in the consolidated statements of operations.

The Company accounts for the sublease with EVA as an operating lease. The Company reviews the right-of-use asset recorded associated with the sublease for impairment whenever events or changes in circumstances indicate that the carrying amount of the right-of-use asset may not be recoverable. Recoverability is measured if the lease cost for the term of the sublease exceeds the anticipated sublease income for the same period on an undiscounted basis and the Company shall treat this circumstance as an indicator that the carrying amount of the right-of-use asset may not be recoverable. There have been no such impairments of right-of-use assets during the year ended December 31, 2019.

Prior to the Company's adoption of ASU 2016-02, when the Company's lease agreements contained renewal options, tenant improvement allowances, rent holidays and rent escalation clauses, the Company recorded a deferred rent asset or liability equal to the difference between the rent expense and the future minimum lease payments due. The lease expense related to operating leases was recognized on a straight-line basis in the consolidated statements of operations over the term of each lease.

Impairment of Long-Lived Assets

The Company reviews property and equipment for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability is measured by the comparison of the carrying amount to the future net cash flows which the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the fair value (i.e. determined through estimating projected discounted future net cash flows or other acceptable methods of determining fair value) arising from the asset. There have been no such impairments of long-lived assets during the years ended December 31, 2019 and 2018.

Fair Value of Financial Instruments

The carrying value of the Company's cash and cash equivalents, restricted cash, accounts payable and accrued liabilities approximate fair value due to the short-term nature of these items.

Fair value is defined as the exchange price that would be received for an asset or an exit price paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs.

The fair value hierarchy defines a three-level valuation hierarchy for disclosure of fair value measurements as follows:

Level 1 Unadjusted quoted prices in active markets for identical assets or liabilities;

Level 2 Inputs other than quoted prices included within Level 1 that are observable, unadjusted quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3 Unobservable inputs that are supported by little or no market activity for the related assets or liabilities.

The categorization of a financial instrument within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement.

The Company's financial instruments consist of Level 1 assets as of December 31, 2019 and 2018. Level 1 securities are comprised of highly liquid money market funds.

Preclinical and Clinical Trial Accruals

The Company's clinical trial accruals are based on estimates of patient enrollment and related costs at clinical investigator sites as well as estimates for the services received and efforts expended pursuant to contracts with multiple research institutions and clinical research organizations ("CROs") that conduct and manage clinical trials on the Company's behalf.

The Company estimates preclinical and clinical trial expenses based on the services performed, pursuant to contracts with research institutions and clinical research organizations that conduct and manage preclinical studies and clinical trials on its behalf. In accruing service fees, the Company estimates the time period over which services will be performed and the level of patient enrollment and activity expended in each period. If the actual timing of the performance of services or the level of effort varies from the estimate, the Company will adjust the accrual accordingly. Payments made to third parties under these arrangements in advance of the receipt of the related services are recorded as prepaid expenses until the services are rendered.

Research and Development

Research and development costs are charged to operations as incurred. Research and development costs include, but are not limited to, payroll and personnel expenses, laboratory supplies, consulting costs, external research and development expenses and allocated overhead, including rent, equipment depreciation, and utilities. Costs to acquire technologies to be used in research and development that have not reached technological feasibility and have no alternative future use are expensed to research and development costs when incurred.

Income Taxes

The Company accounts for income taxes under the asset and liability approach. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to affect taxable income. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized.

The Company assesses all material positions taken in any income tax return, including all significant uncertain positions, in all tax years that are still subject to assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than percent likely of being realized upon ultimate settlement. As of each balance sheet date, unresolved uncertain tax positions must be reassessed, and the Company will determine whether (i) the factors underlying the sustainability assertion have changed and (ii) the amount of the recognized tax benefit is still appropriate. The recognition and measurement of tax benefits requires significant judgment. Judgments concerning the recognition and measurement of a tax benefit might change as new information becomes available.

Stock-Based Compensation

For stock options granted to employees, the Company recognizes compensation expense for all stock-based awards based on the grant-date estimated fair value. The value of the portion of the award that is ultimately expected to vest is recognized as expense ratably over the requisite service period. The fair value of stock options is determined using the Black-Scholes option pricing model. The determination of fair value for stock-based awards on the date of grant using an option pricing model requires management to make certain assumptions regarding a number of complex and subjective variables.

Stock-based compensation expense related to stock options granted to nonemployees is recognized based on the fair value of the stock options, determined using the Black-Scholes option pricing model, as they are earned. The awards generally vest over the time period the Company expects to receive services from the nonemployee.

Comprehensive Loss

Comprehensive loss is defined as a change in equity of a business enterprise during a period, resulting from transactions from non-owner sources. Specifically, the Company includes cumulative foreign currency translation adjustments and net unrealized gains. There was no difference between net loss and comprehensive loss for all periods presented.

Net Loss per Share of Common Stock

Basic net loss per common share is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of common shares outstanding during the period, without consideration for potentially dilutive securities. Diluted net loss per share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of common shares and potentially dilutive securities outstanding for the period. For purposes of the diluted net loss per share calculation, stock options and restricted stock units are considered to be potentially dilutive securities. Because the Company has reported a net loss for the years ended December 31, 2019 and 2018, diluted net loss per common share is the same as basic net loss per common share for those periods.

In-process Research & Development

In-process research and development, or IPR&D, was recorded at its relative fair value using a discounted cash flow model and was assigned to acquired research and development assets that were not fully developed as of the completion of the Merger. IPR&D acquired in an asset purchase is capitalized on the Company's consolidated balance sheet at its acquisition-date fair value if the acquired IPR&D has alternative future use. For the IPR&D that was acquired from the Merger it was determined that the IPR&D had no alternative future use and therefore it was expensed immediately following the Merger. Fair value measurement was classified as Level 3 under the fair value hierarchy.

Intangible Asset

Intangible assets consist of an assembled workforce which was acquired as part of the Merger. Intangible assets with definite lives are amortized based on their pattern of economic benefit over their estimated useful lives and reviewed periodically for impairment. The estimated useful life of the assembled workforce is 3 years.

Revenue Recognition

The Company's sole source of revenue for 2019 and 2018 was grant revenue related to the CPRIT Grant, which is being recognized when qualifying costs are incurred and there is reasonable assurance that the conditions of the award have been met for collection. Proceeds received prior to the costs being incurred or the conditions of the award being met are recognized as deferred revenue until the services are performed and the conditions of the award are met.

Funds received are reflected in deferred revenue as a liability until revenue is earned. Grant revenue is recognized when qualifying costs are incurred. As of December 31, 2019, the Company had an unbilled receivable from CPRIT of $1.6 million, which is reflected in prepaid expenses and other current assets on the accompanying consolidated balance sheet. As of December 31, 2018, the Company had deferred revenue of $0.1 million.

Recent Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board, or FASB, or other standard setting bodies and adopted by us as of the specified effective date. Unless otherwise discussed, the impact of recently issued standards that are not yet effective is not expected to have a material impact on the Company's financial position or results of operations upon adoption.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*. This ASU is a comprehensive new leases standard that amends various aspects of existing guidance for leases and requires additional disclosures about leasing arrangements. The new standard requires that all lessees recognize the assets and liabilities that arise from leases on the balance sheet and disclose qualitative and quantitative information about its leasing arrangements. The classification criteria for distinguishing between finance leases and operating leases are substantially similar to the classification criteria for distinguishing between capital leases and operating leases in the previous lease guidance. ASU 2016-02 is effective for fiscal years beginning after December 15, 2018, and interim periods within those years, with early adoption permitted. In transition, lessees and lessors are required to recognize and measure leases at the beginning of the earliest period presented using a modified retrospective approach. In July 2018, the FASB issued ASU 2018-11, Leases (Topic 842)-Targeted Improvements, that allows entities to apply the provisions of the new standard at the effective date (e.g. January 1, 2019), as opposed to the earliest period presented under the modified retrospective transition approach (January 1, 2017) and recognize a cumulative-effect adjustment to the opening balance of accumulated deficit in the period of adoption. The modified retrospective approach includes a number of optional practical expedients primarily focused on leases that commenced before the effective date of Topic 842, including continuing to account for leases that commence before the effective date in accordance with previous guidance, unless the lease is modified. The Company adopted ASC Topic 842 with the cumulative effect of adoption recognized to accumulated deficit on January 1, 2019, as previously described in Note 2.

As a result of the adoption of ASC 842 on January 1, 2019, the Company derecognized $8.6 million for the existing asset; $7.3 million for the obligation and $1.3 million to the opening balance of the accumulated deficit. The existing asset and obligation on the consolidated balance sheet resulted from the build-to-suit lease arrangement at 1020 Marsh Road, Menlo Park, California or the 1020 Space, which did not meet the criteria for "sale-leaseback" treatment at the time construction was completed in 2017, and the Company has applied the general lessee transition guidance to this lease. Based on the Company's assessment of the 1020 Space, qualifies as an operating lease under ASC 842.

Additionally, as a result of adoption of ASC 842, the Company recognized operating lease ROU assets of approximately $10.4 million, $2.2 million of leasehold improvements, an operating lease obligation of $12.6 million and derecognition of deferred rent of $0.1 million as of January 1, 2019.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation – Stock Compensation (Topic 718) - Improvements to Nonemployee Share-Based Payment Accounting*. This amendment provides additional guidance related to share-based payment transactions for acquiring goods or services from nonemployees. The guidance will be effective for the Company for fiscal years beginning after December 15, 2018, including the interim periods within that fiscal year. The Company has adopted this new guidance as of January 1, 2019, which had no material impact on the Company's consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-08, *Not-For-Profit Entities (Topic 958): Clarifying the Scope and the Accounting Guidance for Contributions Received and Contributions Made*, which is intended to clarify and improve the scope and the accounting guidance for contributions received and contributions made. The amendments in ASU No. 2018-08 should assist entities in (1) evaluating whether transactions should be accounted for as contributions (nonreciprocal transaction) within the scope of Topic 958, Not-for-Profit Entities, or as exchange (reciprocal) transactions subject to other guidance and (2) determining whether a contribution is conditional. This amendment applies to all entities that make or receive grants or contributions. This ASU is effective for public companies serving as a resource recipient for fiscal years beginning after June 15, 2018, including interim periods within that fiscal year. The Company has adopted this guidance as of January 1, 2019 which had no material impact to its consolidated financial statements.

In May 2017, the FASB issued, ASU-2017-09, *Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting*. This guidance clarifies when changes to the terms and conditions of share-based awards must be accounted for as modifications. The guidance does not change the accounting treatment for modifications. The guidance, which became effective on January 1, 2018, has not had a material impact on the Company's consolidated financial statements.

In January 2017, the FASB issued, ASU-2017-01, *Business Combinations (Topic 805) – Clarifying the Definition of a Business.* This guidance clarifies changes to the definition of a business for accounting purposes. Under the new guidance, an entity first determines whether substantially all of the fair value of a set of assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets, also known as the screen test. If this threshold is met under the screen test, the set of assets is not deemed to be a business. If the threshold is not met, the entity then evaluates whether the set of assets meets the requirement to be deemed a business, which at a minimum, requires there to be an input and a substantive process that together significantly contribute to the ability to create outputs. In October 2018, the Company, then known as Versartis, Inc., completed a merger whereby Private Aravive merged with a wholly owned subsidiary of Versartis, Inc. in an all-stock transaction and Private Aravive was the surviving corporation of such merger as a wholly owned subsidiary of the Company (formerly known as Versartis, Inc.). The Merger was accounted for as an acquisition by the Company of Private Aravive's net assets or a group of similar identifiable assets. Substantially all of the fair value of the net acquired assets is concentrated in a single identifiable asset or a group of similar identifiable assets, and as such the set of net assets acquired is not deemed to be a business. The guidance, which has become effective for the Company on January 1, 2018, had a material impact on the Company's consolidated financial statements upon close of the Merger, as the application of the screen test under the new guidance results in the transaction to be accounted for as an asset acquisition.

In November 2016, the FASB issued, ASU-2016-18, *Statement of Cash Flows (Topic 230) - Restricted Cash*. This guidance requires that a statement of cash flows present the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total cash amounts shown on the statement of cash flows. The guidance has become effective on a retrospective basis for the Company on January 1, 2018. The Company retrospectively adjusted the prior periods presented in the Company's consolidated statement of cash flows, which resulted in a reclassification of restricted cash of $2.4 million to the beginning and ending period balances of cash amounts shown on the statement of cash flows prior to the adoption date.

3. Balance Sheet Components

Prepaid expenses and other current assets (in thousands)

	December 31,	
	2019	2018
Preclinical and clinical	$ 531	$ 416
Lease receivable	900	606
Unbilled receivable from CPRIT	1,604	—
Other	44	16
Total	$ 3,079	$ 1,038

Property and equipment, net (in thousands)

	December 31,	
	2019	2018
Equipment and furniture	$ 1,442	$ 1,442
Buildings, leasehold and building improvements	2,674	134
	4,116	1,576
Less: Accumulated depreciation and amortization	(2,308)	(1,544)
Property and equipment, net	$ 1,808	$ 32

Depreciation expense was approximately $0.4 million and $1.1 million for the years ended December 31, 2019 and 2018, respectively.

Intangible asset, net (in thousands)

	December 31,	
	2019	2018
Assembled workforce	$ 366	$ 366
	366	366
Less: Accumulated amortization	(147)	(25)
Intangible asset, net	$ 219	$ 341

Amortization expense is expected to be approximately $0.1 million in each year over the next 1.8 years.

Accrued liabilities (in thousands)

	December 31,	
	2019	2018
Payroll and related	$ 1,248	$ 509
Preclinical and clinical	5	563
Professional services	32	—
Other	212	293
Total	$ 1,497	$ 1,365

4. Fair Value Measurements

The Company's financial instruments consist principally of cash and cash equivalents, prepaid expenses, foreign currency exchange contracts, accounts payable and accrued liabilities. The remaining financial instruments are reported on the Company's consolidated balance sheets at amounts that approximate current fair value. The following table sets forth the Company's financial instruments that were measured at fair value on a recurring basis by level within the fair value hierarchy (in thousands):

	Fair Value Measurements at December 31, 2019	
	Total	Level 1
Assets		
Money market funds	$ 63,691	$ 63,691

	Fair Value Measurements at December 31, 2018	
	Total	Level 1
Assets		
Money market funds	$ 48,389	$ 48,389

The Company recognizes transfers between levels of the fair value hierarchy as of the end of the reporting period. There were no transfers within the hierarchy during the years ended December 31, 2019 or 2018.

5. Leases

The Company adopted ASC 842 as of January 1, 2019, using the modified retrospective approach and therefore prior year financial statements were not recast under the new standard.

In March 2017, the Company entered into an operating facility lease agreement for approximately 34,500 rentable square feet located at the 1020 Space. The lease commenced in August 2017 for a period of 87 months with one renewal option for a five-year term. The Company did not include the renewal option period as the Company determined it was not reasonably certain the lease would be renewed as of the modification date.

In October 2018, the Company executed a sublease agreement in Palo Alto, California for approximately 4,240 square feet for office space. The rental term of the sublease commenced on October 30, 2018 and expires August 31, 2020.

The Company's rent expense including both short-term and variable lease components of $0.5 million associated with the facility leases was $2.5 million for the year ended December 31, 2019. Cash paid for amounts included in the measurement of lease obligations for operating cash flows from operating leases for 2019 was $2.7 million. As of December 31, 2019, the Company's operating leases had a weighted average remaining lease term of 4.6 years and a weighted average discount rate of 7.75%, which approximates the Company's incremental borrowing rate.

As of December 31, 2019, minimum lease payments under non-cancelable operating leases by period were expected to be as follows (in thousands):

Year Ending December 31,	
2020	$ 2,668
2021	2,618
2022	2,697
2023	2,777
2024	2,373
Total future minimum lease payments	13,133
Less: discount	(2,900)
Total lease liabilities	$ 10,233

As of December 31, 2018, minimum lease payments under non-cancelable operating leases by period were expected to be as follows (in thousands):

Year Ending December 31,	
2019	$ 2,652
2020	2,668
2021	2,618
2022	2,697
2023	2,777
Thereafter	2,373
	$ 15,785

1020 Marsh Sublease

In August 2018, the Company entered into an operating sublease agreement with EVA Automation, Inc. ("EVA") for the 1020 Space referenced above. The 1020 Space Sublease commenced on October 1, 2018 for 73 months. EVA is entitled to an abatement of base rent of approximately $0.9 million for the first five full calendar months of the term of the sublease. Lease income associated with this sublease is recorded in other income in the accompanying consolidated statements of operations. The Company has recorded lease income associated with this sublease of approximately $2.5 million and $0.6 million for 2019 and 2018 respectively. During 2019, cash received from EVA was $2.3 million, which amount was included in prepaid expenses and other assets for operating cash flows.

Future base rent and additional rent EVA shall pay to the Company over the sublease term as of December 31, 2019, are as follows (in thousands):

Year Ending December 31,	
2020	$ 2,563
2021	2,628
2022	2,695
2023	2,764
2024	2,355
	$ 13,005

Build-to-Suit Lease

In March 2017, the Company entered into an operating facility lease agreement for approximately 34,500 rentable square feet located at 1020 Marsh Road, Menlo Park, California and for approximately 17,400 rentable square feet located at 1060 Marsh Road. In September 2017, the Company opted out of its intent to occupy 1060 Marsh Road. The Company began occupying 1020 Marsh Rd in August 2017. The lease has a term of 86 months from the commencement date as defined in the lease agreement with the Company's option to extend the term of the lease for an additional five years. The Company is obligated to make lease payments totaling approximately $20.0 million over the initial term of the lease. In connection with this lease, the landlord is providing a tenant improvement allowance of approximately $1.9 million for the 1020 Space, for costs associated with the design, development and construction of the Company's improvements. The Company is obligated to fund all costs incurred in excess of the tenant improvement allowance. The Company provided the Landlord with a letter of credit to secure its obligations under the lease in the initial amount of approximately $2.4 million, reported as restricted cash on the consolidated balance sheets which is subject to reductions in future years if certain financial hurdles are met.

Under the terms of the lease agreement, the Company has indemnified the landlord during the construction period. Accordingly, for accounting purposes, the Company has concluded that it is the deemed owner of the building during the construction period and the Company capitalized approximately $8.9 million within build-to-suit lease asset and recognized an $7.3 million corresponding build-to-suit lease obligation in non-current liabilities in the consolidated balance sheet as of December 31, 2018. Of the $8.9 million, approximately $3.5 million has been recorded as a build-to-suit asset related to construction costs incurred by the Company as of December 31, 2018. Rent expense was $0.3 million for the year ended December 31, 2018.

6. Commitments and Contingencies

Purchase Commitments

The Company conducts research and development programs through a combination of internal and collaborative programs that include, among others, arrangements with contract manufacturing organizations and contract research organizations. The Company had contractual arrangements with these organizations including license agreements with milestone obligations and service agreements with obligations largely based on services performed.

In the normal course of business, the Company enters into various firm purchase commitments related to certain preclinical and clinical studies.

Contingencies

In the normal course of business, the Company enters into contracts and agreements that contain a variety of representations and warranties and provide for general indemnifications. The Company's exposure under these agreements is unknown because it involves claims that may be made against the Company in the future but have not yet been made. The Company accrues a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated.

Indemnification

In accordance with the Company's amended and restated Certificate of Incorporation and amended and restated bylaws, the Company has indemnification obligations to its officers and directors for certain events or occurrences, subject to certain limits, while they are serving at the Company's request in such capacity. There have been no claims to date and the Company has a director and officer insurance policy that may enable it to recover a portion of any amounts paid for future claims.

Litigation

The Company may from time to time be involved in legal proceedings arising from the normal course of business. There are no pending or threatened legal proceedings as of December 31, 2019.

Contingent payable

As part of the Merger, the Company acquired a settlement that Private Aravive entered into with former creditors in 2014 pursuant to which Private Aravive had agreed to make an initial 7.5% cash payment to the creditors with the remainder contingent on future milestone payments, or Contingent Payments, until full repayment of the payables is made. The contingent Payments are to be made from the proceeds received by Private Aravive from any future licensing transactions. The Contingent Payments will be distributed on a pro rata basis with other secured creditors and will be made from at least 10% of any proceeds from any future licensing transactions. The proceeds from any future licensing transactions will be held in an escrow account which will be administered by an independent third party. The creditors agree that the Initial payment and any Contingent Payments represents settlement in full of all outstanding obligations owed to the creditors by Private Aravive and released Private Aravive from all claims. As a result of and in connection with the Merger, the Company determined the fair value of the contingent payable to be approximately $264,000, based upon an appraisal (or valuation) of the assets and liabilities assumed to determine fair values.

7. Common Stock

The Amended and Restated Certificate of Incorporation, authorizes the Company to issue 100,000,000 shares of common stock as of December 31, 2019. Common stockholders are entitled to dividends as and when declared by the Board of Directors, subject to the rights of holders of all classes of stock outstanding having priority rights as to dividends. There have been no dividends declared to date. The holder of each share of common stock is entitled to one vote.

The Company had reserved shares of common stock for future issuances as follows:

	December 31,	
	2019	2018
Issuance of equity based awards under stock plan	1,391,697	1,201,581
Issuance upon exercise of options under stock plan	1,820,160	1,515,923
Issuance of restricted stock units under stock plan	42,112	117,597
Total	3,253,969	2,835,101

In connection with the completion of the Merger, on October 15, 2018, the amended and restated certificate of incorporation of the Company was amended to effect, at 12:01 a.m. Eastern Time on October 16, 2018, a reverse split of Company Common Stock at a ratio of 1-for-6 (the "Amended Certificate"). The accompanying consolidated financial statements and notes to consolidated financial statements give retroactive effect to the reverse stock split for all periods presented.

In December 2019, the Company closed a public offering of its common stock pursuant to which the Company issued 3,633,334 shares of common stock, which included shares issued pursuant to the underwriters' partial exercise of their over-allotment option, and received net proceeds of approximately $25.1 million, after underwriting discounts, commissions and offering expenses.

Related party transaction

On December 2, 2019, an entity affiliated with a member of our board of directors, invested approximately $1,000,000 in our public offering and acquired 133,333 shares of common stock in the offering.

8. Stock Based Awards

Equity Incentive Plans

The Company's Board of Directors, or Board, and stockholders approved the 2019 Equity Incentive Plan, or the 2019 Plan, which became effective on September 12, 2019. The 2019 Plan is a successor to and continuation of all prior plans including the Company's 2014 Equity Incentive Plan and Private Aravive's 2017 Equity Incentive Plan and the 2010 Equity Incentive Plan, as amended (Prior Plans). As of December 31, 2019, the total number of shares of common stock available for issuance under the 2019 Plan was 1,391,697. In addition, if the shares subject to outstanding stock options or other awards under the Prior Plans: (I) terminate or expire prior to exercise or settlement; (II) are not issued because the award is settled in cash; (III) are forfeited because of failure to vest; (IV) or are reacquired or withheld (or not issued) to satisfy a tax withholding obligation or the purchase or exercise price, if any, such shares will become available for issuance under the 2019 Plan. Unless the Board provides otherwise, beginning January 1, 2020 with expiration of January 1, 2029, the total number of shares of common stock available for issuance will automatically increase annually on January 1 of each calendar year by 4.5% of the total number of issued and outstanding shares of common stock as of December 31 of the immediately preceding year. The 2019 Plan provides for granting of equity awards to employees, directors and consultants, including incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards and performance awards.

Activity under the Company's stock option plans is set forth below:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value (in thousands)
Balances, January 1, 2018	607,511	$ 81.60		
Additional shares authorized	—	—		
Assumption of option plans associated with the merger	1,183,950	0.44		
Options granted	—	—		
Restricted stock units granted	—	—		
Options exercised	(3,643)	9.66		
Options cancelled	(271,895)	80.09		
Balances, December 31, 2018	1,515,923	18.65		
Additional shares authorized	—	—		
Options granted	483,328	5.55		
Restricted stock units granted	—	—		
Options exercised	(39,686)	2.40		
Options cancelled	(139,405)	81.33		
Balances, December 31, 2019	1,820,160	$ 10.70	6.6	$ 18,957
Vested and expected to vest as of December 31, 2019	1,796,997	$ 10.75	6.6	$ 18,778
Exercisable as of December 31, 2019	1,474,782	$ 11.31	6.0	$ 16,311

The intrinsic values of outstanding, vested and exercisable options were determined by multiplying the number of shares by the difference in exercise price of the options and the fair value of the common stock. The intrinsic value of stock options exercised during the years ended December 31, 2019 and 2018, was $0.4 million and none, respectively.

The following table summarizes information with respect to stock options outstanding and currently exercisable and vested as of December 31, 2019:

	Options Outstanding		Options Exercisable and Vested	
Range of Exercise Prices	Number Outstanding	Weighted Average Remaining Contractual Life (in Years)	Number Outstanding	Weighted Average Remaining Contractual Life (in Years)
$0.06-$0.06	86,867	1.5	86,867	1.5
$0.24-$0.24	621,098	5.4	621,098	5.4
$0.66-$0.90	451,632	7.8	451,632	7.8
$3.54-$5.83	385,673	8.8	110,828	8.8
$5.87-$191.76	274,890	5.8	204,357	5.8
	1,820,160		1,474,782	

Stock Options Granted to Employees

During the year ended December 31, 2019, the Company granted stock options to officers, directors and employees to purchase shares of common stock with a weighted-average grant date fair value of $4.69 per share. The fair value is being expensed over the vesting period of the options, which is usually 4 years on a straight-line basis as the services are being provided. No tax benefits were realized from options and other share-based payment arrangements during the periods. For the year ended December 31, 2018 the fair value assumptions noted below, were all related to the assumed fully vested stock options in accordance with the Merger. No options were granted during the year ended December 31, 2018.

As of December 31, 2019, total unrecognized employee stock-based compensation related to stock options granted was $2.0 million, which is expected to be recognized over the weighted-average remaining vesting period of 2.8 years.

The fair value of employee stock options was estimated using the Black-Scholes model with the following weighted-average assumptions:

	Year Ended December 31,	
	2019	2018
Expected volatility	111.0%	132.0%
Risk-free interest rate	2.4%	3.0%
Dividend yield	0.0%	0.0%
Expected life (in years)	6.0	3.3

Determining Fair Value of Stock Options

The fair value of each grant of stock options was determined by the Company using the methods and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment to determine.

Expected Volatility – Beginning in 2018, the Company had enough historical stock price information in order to value the options assumed in the Merger. The Company continues to utilize our historical stock prices in order to estimate the expected volatility.

Risk-Free Interest Rate – The risk-free rate assumption was based on the U.S. Treasury instruments with terms that were consistent with the expected term of the Company's stock options.

Expected Dividend – The expected dividend assumption was based on the Company's history and expectation of dividend payouts.

Expected Term – The expected term of stock options represents the weighted average period the stock options are expected to be outstanding. For option grants that are considered to be "plain vanilla", the Company has opted to use the simplified method for estimating the expected term as provided by the Securities and Exchange Commission. The simplified method calculates the expected term as the average time-to-vesting and the contractual life of the options.

Forfeiture Rate – Forfeitures were estimated based on historical experience.

Fair Value of Common Stock – The fair value of the underlying common stock is based upon quoted prices on the Nasdaq Global Select Market.

Stock-based compensation expense, net of estimated forfeitures, is reflected in the statements of operations as follows (in thousands):

	Year Ended December 31,	
	2019	2018
Operating Expenses		
Research and development	$ 347	$ 2,946
General and administrative	3,052	13,193
Total	$ 3,399	$ 16,139

2014 Employee Stock Purchase Plan

The board of directors adopted, and the Company's stockholders approved, the 2014 Employee Stock Purchase Plan, or the ESPP, in March 2014. The ESPP became effective on March 20, 2014.

The maximum aggregate number of shares of common stock that may be issued under the ESPP per purchase period is 416 shares (which was adjusted for the reverse stock split that occurred in October 2018). In November 2019, the board of directors adopted a resolution to increase the maximum aggregate number of shares of common stock that may be issued under the ESPP per purchase period 2,500 shares, beginning with the offering period that starts in May 2020. Additionally, the number of shares of common stock reserved for issuance under the ESPP will increase automatically each year, beginning on January 1, 2015 and continuing through and including January 1, 2024, by the lesser of (i) 1% of the total number of shares of our common stock outstanding on December 31 of the preceding calendar year; and (ii) 50,000 shares of common stock (which was adjusted for the reverse stock split that occurred in October 2018). The board of directors may act prior to the first day of any calendar year to provide that there will be no January 1 increase or that the increase will be for a lesser number of shares than would otherwise occur. Shares subject to purchase rights granted under the ESPP that terminate without having been exercised in full will not reduce the number of shares available for issuance under the ESPP.

An employee may not be granted rights to purchase stock under the ESPP if such employee (i) immediately after the grant would own stock possessing 5% or more of the total combined voting power or value of the Company's common stock, or (ii) holds rights to purchase stock under the ESPP that would accrue at a rate that exceeds $25,000 worth of our stock for each calendar year that the rights remain outstanding.

The administrator may approve offerings with a duration of not more than 27 months, and may specify one or more shorter purchase periods within each offering. Each offering will have one or more purchase dates on which shares of common stock will be purchased for the employees who are participating in the offering. The administrator, in its discretion, will determine the terms of offerings under the ESPP.

The ESPP permits participants to purchase shares of our common stock through payroll deductions with up to 15% of their earnings. The purchase price of the shares will be not less than 85% of the lower of the fair market value of our common stock on the first day of an offering or on the date of purchase. The fair value of the ESPP grants were immaterial for the years ended December 31, 2019 and 2018, respectively.

Restricted Stock Units

Restricted stock units are shares of common stock which are forfeited if the employee leaves the Company prior to vesting. These stock units offer employees the opportunity to earn shares of the Company's stock over time, rather than options that give the employee the right to purchase stock at a set price. As a result of these restricted stock units, the Company recognized $1.4 million and $3.2 million, in compensation expense during the years ended December 31, 2019 and 2018, respectively. As all of the restricted stock vests through 2019 and beyond, the Company will continue to recognize stock-based compensation expense related to the grants of these restricted stock units. If all of the remaining restricted stock units that were granted in prior years vest, the Company will recognize approximately $0.7 million in compensation expense over a weighted average remaining period of 2 years. However, no compensation expense will be recognized for restricted stock units that do not vest.

A summary of the Company's restricted stock activity is presented in the following tables:

	Number of Shares	Weighted Average Grant Date Fair Value
Restricted Stock Units		
Unvested at December 31, 2018	117,597	$ 31.37
Granted	—	—
Vested	(59,567)	31.37
Forfeited/canceled	(15,918)	27.16
Unvested at December 31, 2019	42,112	$ 32.97

9. Income Taxes

The provision (benefit) for federal income taxes in 2019 and 2018 is as follows (in thousands):

	December 31,	
	2019	2018
Current		
Federal	$ —	$ —
State	—	—
	—	—
Deferred		
Federal	$ —	$ —
State	—	—
Total deferred tax expense	—	—
Total income tax expense	$ —	$ —

	December 31,	
	2019	2018
United States	$ (18,218)	$ (76,256)
Foreign	(0)	(77)
Net loss before provision for income taxes	$ (18,218)	$ (76,333)

Income tax expense (benefit) in 2019 and 2018 differed from the amount expected by applying the statutory federal tax rate to the income or loss before taxes as summarized below:

	December 31,	
	2019	2018
Federal tax benefit at statutory rate	21%	21%
Change in valuation allowance	(23)%	103%
Section 382 limitation	—	(109)%
Other non-deductible expenses	(1)%	(11)%
Stock based compensation	(7)%	(4)
ASC 842 lease accounting	10%	—
Total	0%	0%

Deferred income taxes reflect the net tax effects of net operating loss and tax credit carryforwards and temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's net deferred tax assets at December 31, 2019 and 2018 are as follows (in thousands):

	December 31,	
	2019	2018
Net operating loss carry forwards	$ 5,869	$ 2,335
Research and development tax credits	90	168
Stock based compensation and other	5,099	5,263
Operating lease obligation	2,149	—
Total deferred tax assets	13,207	7,766
Less: Valuation allowance	(11,326)	(7,032)
Deferred tax liabilities	(55)	(734)
Operating lease right-of-use assets	(1,826)	—
Net deferred tax assets	$ —	$ —

Subsequent to the issuance of the December 31, 2018 consolidated financial statements, the Company corrected the deferred tax asset related to stock based compensation and valuation allowance disclosed in the table above to reflect the appropriate deferred tax asset and valuation allowance amounts as of December 31, 2018. The adjustment decreased the previously reported deferred tax asset and the previously reported valuation allowance by $3.3 million. The correction did not have a material impact on the consolidated financial statements for the year ended December 31, 2018 and did not impact the Company's Consolidated Balance Sheets, Consolidated Statements of Operations, or Consolidated Statements of Cash Flows as of or for the year ended December 31, 2019.

The Company's accounting for deferred taxes involves the evaluation of a number of factors concerning the realizability of its net deferred tax assets. The Company primarily considered such factors as its history of operating losses, the nature of the Company's deferred tax assets, and the timing, likelihood and amount, if any, of future taxable income during the periods in which those temporary differences and carryforwards become deductible. At present, the Company does not believe that it is more likely than not that the deferred tax assets will be realized; accordingly, a full valuation allowance has been established and no deferred tax asset is shown in the accompanying consolidated balance sheets.

The valuation allowance increased by approximately $4.3 million in 2019 and decreased by $95.1 million in 2018.

At December 31, 2019, the Company has net operating loss carryforwards for federal income tax purposes of approximately $27.9 million, of which $23.1 million was generated post December 31, 2017 (after section 382 limitation) and will have no expiration date. The remaining $4.8 million of net operating loss carryforwards begin to expire in 2037. The Company also has federal research and development tax credits of approximately $90 thousand, which begin to expire in 2037.

As of December 31, 2019, the Company's total gross deferred tax assets were $13.2 million. Due to the Company's lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance. The deferred tax assets were primarily comprised of federal tax net operating losses and tax credit carryforwards. Utilization of net operating losses and tax credit carryforwards may be limited by the "ownership change" rules, as defined in Section 382 of the Internal Revenue Code (any such limitation, a "Section 382 limitation"). Similar rules may apply under state tax laws. The Company has performed an analysis to determine whether an "ownership change" occurred from inception up to the Private Aravive's acquisition date. Based on this analysis during 2018, management determined that both Versartis, Inc. and Private Aravive did experience ownership changes, which resulted in a significant impairment of the net operating losses and credit carryforwards. In 2019, no additional ownership changes were noted.

The Company follows the provisions of FASB Accounting Standards Codification 740-10 (ASC 740-10), Accounting for Uncertainty in Income Taxes. ASC 740-10 prescribes a comprehensive model for the recognition, measurement, presentation and disclosure in consolidated financial statements of uncertain tax positions that have been taken or expected to be taken on a tax return. No liability related to uncertain tax positions is recorded in the consolidated financial statements. At December 31, 2019 and 2018, the Company's reserve for unrecognized tax benefits is approximately $39 thousand and $72 thousand, respectively. Due to the above-mentioned Section 382 limitation and impairment of tax attributes, in 2018 there was a decrease in prior year unrecognized tax benefits of $3.9 million. Due to the full valuation allowance at December 31, 2018, current adjustments to the unrecognized tax benefit will have no impact on the Company's effective income tax rate. The Company does not anticipate any significant change in its unrecognized tax benefits within 12 months of this reporting date. The Company includes penalties and interest expense related to income taxes as a component of other expense and interest expense, respectively, as necessary.

Because the statute of limitations does not expire until after the net operating loss and credit carryforwards are actually used, the statute is effectively open for all tax years. However, due to the above-mentioned ownership change and impairment of net operating loss and credit carryforwards, only net operating loss and credit carryforwards post-January 14, 2017 are carried forward to future years for federal and state tax purposes.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows (in thousands):

	Amount
Balance at January 1, 2018	$ 3,934
Gross increase/ (decrease) related to prior year tax positions	(3,934)
Gross increase related to current year positions	72
Reductions to unrecognized tax benefits related to lapsing statute of limitations	—
Balance at December 31, 2018	$ 72
Gross increase/ (decrease) related to prior year tax positions	(72)
Gross increase related to current year positions	39
Reductions to unrecognized tax benefits related to lapsing statute of limitations	—
Balance at December 31, 2019	$ 39

All tax years remain open for examination by federal and state tax authorities.

The Tax Cuts and Jobs Act ("the Act") was enacted on December 22, 2017. The Act reduces the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign sourced earnings. The Company is required to recognize the effect of the tax law changes in the period of enactment, such as determining the estimated transition tax, remeasuring our U.S. deferred tax assets and liabilities at a 21% rate as well as reassessing the net realizability of our deferred tax assets and liabilities.

Accordingly, the Company remeasured certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future. The provisional amount related to the re-measurement of our deferred tax balance is a reduction of approximately $33 million. Due to the corresponding valuation allowance fully offsetting deferred taxes, there is no income statement impact.

In December 2017, the SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (SAB 118) which allows companies to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. In Q4 2018, the Company completed its analysis within the measurement period in accordance with SAB 118 and found no change to the provisional amount on 2017 tax provision.

10. Restructuring Plan

In October 2017, the Board of Directors of the Company approved a plan of termination to eliminate a number of positions effective October 20, 2017 (the “Restructuring Plan”), as part of its commitment to reduce costs following the failure of the Phase 3 VELOCITY trial of somavaratan to reach its primary endpoint. The reduction included 45 employees, which represented approximately 62% of its workforce as of October 6, 2017. Affected employees were notified of the Restructuring Plan on October 6, 2017. Simultaneously with the Restructuring Plan the Company established a Severance Benefit Plan (the “Plan”) for affected employees as well as a retention plan for retained employees. The Plan provides payment of severance benefits to affected employees of the Company. The Company granted approximately 907,000 restricted stock units to retained employees with a two year vesting schedule and offered a cash retention bonus of 50% of each retained employees then current base salary, which will be earned and payable subject to continued employment for an additional 12 months.

Employee severance costs are accrued when the restructuring actions are probable and estimable. Costs for one-time termination benefits in which the employee is required to render service until termination in order to receive the benefits are recognized ratably over the future service period. During the year ended December 31, 2018, the Company incurred severance-related charges totaling $4.2 million, of which $1.7 million is included within general and administrative expenses and $2.5 million is included within research and development expenses. There was no balance owed under these restructuring plans as of December 31, 2018.

11. Employee Benefit Plans

Defined Contribution Plan

The Company sponsors a 401(k) Plan, which stipulates that eligible employees can elect to contribute to the 401(k) Plan, subject to certain limitations of eligible compensation. The Company may match employee contributions in amounts to be determined at the Company’s sole discretion. To date, the Company has not made any matching contributions.

Severance Benefit Plan & Retention Cash Bonus

Simultaneously with the Restructuring Plan, the Company established a Severance Benefit Plan (the "Plan") for affected employees (See Note 10) as well as a retention plan for retained employees. The Plan provides payment of severance benefits to affected employees of the Company. The Company granted approximately 151,000 restricted stock units to retained employees with a two year vesting schedule and offered a cash retention bonus of 50% of each retained employees then current base salary, of which $1.5 million was paid in October 2018.

12. Net loss per share of Common Stock

The following table summarizes the computation of basic and diluted net loss per share attributable to common stockholders of the Company (in thousands, except per share data):

	December 31,	
	2019	2018
Net loss attributable to common stockholders- basic and diluted	$ (18,218)	$ (76,333)
Net loss per share- basic and diluted	$ (1.57)	$ (10.64)
Weighted-average common shares used to compute net loss per share- basic and diluted	11,589	7,171

Basic net loss attributable to common stockholders per share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of common shares outstanding for the period. Diluted net loss attributable to common stockholders per share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of common shares and dilutive common stock equivalents outstanding for the period, determined using the treasury-stock method and the as-if converted method, for convertible securities, if inclusion of these is dilutive. Because the Company has reported a net loss for the years ended December 31, 2019 and 2018, the Company did not have dilutive common stock equivalents and therefore diluted net loss per common share is the same as basic net loss per common share for those years.

The following potentially dilutive securities outstanding at the end of the years presented have been excluded from the computation of diluted shares outstanding:

	December 31,	
	2019	2018
Options to purchase common stock	1,820,160	1,515,923
Restricted stock units	42,112	117,597

13. Merger with Aravive Biologics, Inc.

On October 12, 2018, pursuant to the terms of the Agreement and Plan of Merger and Reorganization, dated as of June 3, 2018, by and between the Company, then known as Versartis, Inc., Velo Merger Sub, Inc., a Delaware corporation and wholly-owned subsidiary of the Company ("Merger Sub"), and Private Aravive, Merger Sub was merged with and into Private Aravive (the "Merger"), with Private Aravive surviving the Merger as a wholly-owned subsidiary of the Company. Pursuant to the terms of the Merger Agreement, at the effective time of the Merger or the Effective Time, each outstanding share of capital stock of Private Aravive (other than any shares held as treasury stock) was converted into the right to receive 2.2801 shares of the Company's common stock, par value $0.0001 per share (the "Company Common Stock"), without giving effect to any adjustment for the reverse stock split described below, and (b) each outstanding Private Aravive stock option, all of which were in-the-money, whether vested or unvested, that had not previously been exercised prior to the Effective Time was converted into an option to purchase 2.2801 shares of the Company Common Stock for each share of Private Aravive common stock covered by such option. The aggregate consideration issued in the Merger to the former security holders of Private Aravive, was 5,141,915 shares of Company Common Stock.

The Merger was accounted for as an asset acquisition by the Company. To determine the accounting for this transaction under GAAP, the Company assessed whether an integrated set of assets and activities were accounted for as an acquisition of a business or an asset acquisition. The guidance requires an initial screen test to determine if substantially all of the fair value of the gross assets acquired is concentrated in a single asset or group of similar assets. If that screen is met, the set is not a business. In connection with the acquisition of Private Aravive, the Company determined that substantially all the fair value is included in in-process research and development of Private Aravive's lead asset, AVB-500 and, as such, the acquisition is treated as an asset acquisition. The net tangible and intangible assets acquired and liabilities assumed in connection with the transaction were recorded based on their relative fair values allocation as of October 12, 2018 and the value associated with in-process research and development will be expensed as it was determined to have no alternative future use. The estimate of the purchase price for the fair value of the identifiable tangible and intangible assets acquired and liabilities assumed, were as follows.

	Amount (in thousands)
Consideration	
Common stock issued - 5,141,915 shares issued at $7.26 per share	$ 37,331
Transaction costs	2,076
Total consideration	$ 39,407
Assets acquired and liabilities assumed	
Cash	$ 5,277
In-process research and development	38,313
Assembled workforce	366
Deferred revenue	(1,517)
Contingent payable	(264)
Other assets and liabilities	(2,768)
Total net assets acquired	$ 39,407

Corporate Name Change

On October 15, 2018, the Company changed its name to "Aravive, Inc." from Versartis, Inc. Shares of Company Common Stock were previously listed on the Nasdaq Global Select Market under the symbol "VSAR." The Company filed with The Nasdaq Stock Market, LLC ("Nasdaq") a notification form for the listing of additional shares with respect to the shares of Company Common Stock to be issued to the holders of Aravive Biologics, Inc. capital stock in the Merger so that these shares are listed on Nasdaq. The Company Common Stock began trading on the Nasdaq Global Select Market under the symbol "ARAV" on October 16, 2018.

14. Subsequent Events

On January 8, 2020 upon the appointment of Ms. Hemrajani as the Company's President and Chief Executive Officer, Jay Shepard resigned as the Company's Chief Executive Officer and assumed Chairman of the Board of Directors. On January 9, 2020 the Company entered into a separation agreement with Mr. Shepard along with a consulting agreement. This consulting agreement provides that in consideration for Mr. Shepard providing transition services to the Company, the Company agreed to pay Mr. Shepard $150,000 payable pro-rata on a monthly basis over a six-month period along with reimbursement of all COBRA payments made for the benefits during the consulting period.

In March 2020, the World Health Organization declared coronavirus (COVID-19) a global pandemic. This contagious disease outbreak, which has continued to spread, and any related adverse public health developments, has adversely affected workforces, economies, and financial markets globally, potentially leading to an economic downturn. It has also disrupted the normal operations of many businesses. A health pandemic is a disease outbreak that spreads rapidly and widely by infection and affects many individuals in an area or population at the same time. Aravive and the business of the supplier of our clinical product candidate and the suppliers of the standard of care drugs that are administered in combination with our clinical product candidate could be materially and adversely affected by the risks, or the public perception of the risks, related to a pandemic or other health crisis. Such events could result in the complete or partial closure of one or more manufacturing facilities which could impact our supply of our clinical product candidate or the standard of care drugs that are administered in combination with our clinical product candidate.

In March 2020, the Company has decided to amend its clear renal cell carcinoma to initiate treatment at 15 mg/kg or 20 mg/kg given the safety profile seen with the 15 mg/kg dosing cohort of the platinum resistant ovarian cancer (PROC) trial and the recent initiation of the 20 mg/kg dosing cohort in the PROC population. While this may delay first patient dosing, the overall timelines for top line data may not be significantly impacted given the higher starting dose, assuming the COVID-19 situation does not interfere with ongoing clinical studies. Also, to reduce the risk of unnecessary exposure of patients to COVID-19 that may be caused by

patients coming to health centers for their AVB-500 intravenous infusion, the Company will pause new enrollment in its IgA nephropathy (IgAN) trial as this is a relatively healthy patient population with a chronic disease.

In addition, an outbreak near where our clinical trial sites are located would likely impact our ability to recruit patients, delay our clinical trials, and could affect our ability to complete our clinical trials within the planned time periods. It is not possible for the Company to predict the duration or magnitude of the adverse results of the outbreak and its effects on our business or results of operations at this time.

Exhibit Index

Exhibit Number	Description
1.1	Equity Distribution Agreement, dated as of March 26, 2019 between Aravive, Inc. and Piper Jaffray & Co Incorporated herein by reference to exhibit number 1.1 of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on March 26, 2019).
3.1	Amended and Restated Certificate of Incorporation (Incorporated herein by reference to the same numbered exhibit of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on March 26, 2014).
3.2	Certificate of Amendment of Amended and Restated Certificate of Incorporation of Versartis, Inc. (Incorporated herein by reference to exhibit number 3.1 of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on June 1, 2017).
3.3	Certificate of Amendment of Amended and Restated Certificate of Incorporation of Versartis, Inc. (Incorporated herein by reference to exhibit number 3.1 of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on September 12, 2017).
3.4	Certificate of Amendment of Amended and Restated Certificate of Incorporation of Versartis, Inc. (Incorporated herein by reference to exhibit number 3.1 of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on October 16, 2018).
3.5	Certificate of Amendment of Amended and Restated Certificate of Incorporation of Versartis, Inc. (Incorporated herein by reference to exhibit number 3.2 of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on October 16, 2018).
3.6	Certificate of Correction to Certificate of Amendment of Amended and Restated Certificate of Incorporation of Aravive, Inc. (Incorporated herein by reference to exhibit number 3.6 on our annual report on Form 10-K (File No. 001-36361), as filed with the SEC on March 15, 2019).
3.7	Amended and Restated Bylaws. (Incorporated herein by reference to Exhibit 3.4 of our registration statement on Form S-1, as amended (File No. 333-193997), as filed with the SEC on March 6, 2014).
4.1	Form of Stock Certificate. (Incorporated herein by reference to the same numbered exhibit of our quarterly report on Form 10-Q (File No. 001-36361), for the quarterly period ended March 31, 2014, as filed with the SEC on May 14, 2014).
4.2#	Description of Capital Securities.
4.3*	The Aravive, Inc. 2019 Equity Incentive Plan (incorporated by reference to Appendix A to the Definitive Proxy Statement on Schedule 14A filed with the Securities and Exchange Commission on August 9, 2019).
10.1	Lease by and between the Company and CA-Shorebreeze Limited Partnership, dated as of August 31, 2011. (Incorporated herein by reference to the same numbered exhibit of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.2*	2009 Stock Plan, as amended. (Incorporated herein by reference to the same numbered exhibit of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.3*	Form of Notice of Stock Option Grant and Incentive Stock Option Agreement under 2009 Stock Plan. (Incorporated herein by reference to the same numbered exhibit of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.4*	Form of Notice of Stock Option Grant and Non-Statutory Stock Option Agreement under 2009 Stock Plan. (Incorporated herein by reference to the same numbered exhibit of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.5*	2014 Equity Incentive Plan. (Incorporated herein by reference to Exhibit 3.4 of our registration statement on Form S-1, as amended (File No. 333-193997), as filed with the SEC on March 6, 2014).
10.6*	Form of 2014 Equity Incentive Plan Stock Option Grant Notice and Stock Option Agreement. (Incorporated herein by reference to Exhibit 99.5 of our registration statement on Form S-8 (File No. 333-194949), as filed with the SEC on April 1, 2014).
10.7*	Form of 2014 Equity Incentive Plan Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement. (Incorporated herein by reference to Exhibit 10.1 of our current report on Form 8-K (File No. 001-36361), as filed with the SEC on April 17, 2014).

Exhibit Number	Description
10.8*	Change in Control Severance Plan. (Incorporated herein by reference to Exhibit 10.7 of our registration statement on Form S-1, as amended (File No. 333-193997), as filed with the SEC on March 10, 2014).
10.9*	2014 Employee Stock Purchase Plan. (Incorporated herein by reference to Exhibit 10.9 of our registration statement on Form S-1, as amended (File No. 333-193997), as filed with the SEC on March 6, 2014).
10.10*	Form of Indemnification Agreement by and between the Company and each of its directors and officers. (Incorporated herein by reference to Exhibit 10.10 of our registration statement on Form S-1, as amended (File No. 333-193997), as filed with the SEC on March 6, 2014).
10.11†	Services Agreement by and between the Company and Amunix Operating Inc., dated as of March 18, 2013. (Incorporated herein by reference to Exhibit 10.14 of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.12†	Second Amended and Restated Licensing Agreement by and between the Company and Amunix Operating, Inc., dated as of December 30, 2010. (Incorporated herein by reference to Exhibit 10.15 of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.13†	Letter Agreement by and between the Company and Amunix Operating, Inc., dated as of February 3, 2011. (Incorporated herein by reference to Exhibit 10.16 of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.14†	Amendment No. 1 to the Second Amended and Restated Licensing Agreement by and between the Company and Amunix Operating, Inc., dated as of January 7, 2013. (Incorporated herein by reference to Exhibit 10.17 of our registration statement on Form S-1 (File No. 333-193997), as filed with the SEC on February 18, 2014).
10.15	Amendment No. 2 to Second Amended and Restated Licensing Agreement by and between the Company and Amunix Operating, Inc., dated as of February 25, 2014. (Incorporated herein by reference to Exhibit 10.21 of our registration statement on Form S-1, as amended (File No. 333-193997), as filed with the SEC on March 06, 2014).
10.16*	Offer letter between the Company and Jay Shepard dated as of May 12, 2015. (Incorporated herein by reference to Exhibit 10.7 of our quarterly report on Form 10-Q (File No. 001-36361), as filed with the SEC on August 8, 2015).
10.17	Operating Lease Agreement by and between Versartis, Inc. and Bohannon Associates dated March 17, 2017 (Incorporated herein by reference to Exhibit 10.1 of our quarterly report on Form 10-Q (File No. 001-36361), as filed with the SEC on May 10, 2017).
10.18†	Amended Amunix License Agreement by and between Versartis, Inc. and Amunix Operating, Inc. dated March 22, 2016 (Incorporated herein by reference to Exhibit 10.2 of our quarterly report on Form 10-Q (File No. 001-36361), as filed with the SEC on August 7, 2017).
10.19*	Offer Letter with Robert Gut, dated August 30, 2017 (Incorporated herein by reference to Exhibit 10.37 of our annual report on Form 10-K (File No. 001-36361), as filed with the SEC on March 6, 2018).
10.20	Agreement and Plan of Merger and Organization among Versartis, Inc., Velo Merger Sub, Inc. and Aravive Biologics, Inc. dated as of June 3, 2018 (Incorporated herein by reference to Exhibit 2.1 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on June 4, 2018).
10.21	Form of Support Agreement, by and between Versartis, Inc. and Aravive Biologics, Inc.'s directors, officers and certain stockholders (Incorporated herein by reference to Exhibit 2.2 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on June 4, 2018).
10.22	Form of Support Agreement, by and between Aravive Biologics, Inc. and Versartis, Inc.'s directors, officers and certain stockholders (Incorporated herein by reference to Exhibit 2.3 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on June 4, 2018).
10.23	Cancer Research Grant Contract, dated December 1, 2015, by and between the Cancer Prevention and Research Institute of Texas and Ruga Corporation (Incorporated herein by reference to Exhibit 10.1 of our registration statement on Form S-4/A (File No. 333-226594 as filed with the SEC on August 24, 2018).
10.24†	Exclusive License Agreement, dated January 25, 2012, by and between The Board of Trustees of the Leland Stanford Junior University and Ruga Corporation (Incorporated herein by reference to Exhibit 10.2 of our registration statement on Form S-4/A (File No. 333-226594 as filed with the SEC on August 24, 2018).

Exhibit Number	Description
10.25†	Amendment to the Exclusive License Agreement, dated July 26, 2012, by and between the Board of Trustees of Leland Stanford Junior University and Ruga Corporation (Incorporated herein by reference to Exhibit 10.3 of our registration statement on Form S-4 (File No. 333-226594 as filed with the SEC on August 3, 2018).
10.26†	Amendment No. 2 to the Exclusive License Agreement, dated September 25, 2017, by and between The Board of Trustees of the Leland Stanford Junior University and Ruga Corporation (Incorporated herein by reference to Exhibit 10.4 of our registration statement on Form S-4 (File No. 333-226594 as filed with the SEC on August 3, 2018).
10.27†	Amendment No. 3 to the Exclusive License Agreement, dated September 25, 2017, by and between The Board of Trustees of the Leland Stanford Junior University and Ruga Corporation (Incorporated herein by reference to Exhibit 10.5 of our registration statement on Form S-4 (File No. 333-226594 as filed with the SEC on August 3, 2018).
10.28†	Master Manufacturing Services Agreement, dated July 11, 2016, by and between WuXi Biologics (Hong Kong) Limited and Aravive Biologics, Inc. (Incorporated herein by reference to Exhibit 10.6 of our registration statement on Form S-4/A (File No. 333-226594 as filed with the SEC on August 24, 2018).
10.29†	License Agreement dated December 1, 2017, by and between WuXi Biologics (Hong Kong) Limited and Aravive Biologics, Inc. (Incorporated herein by reference to Exhibit 10.7 of our registration statement on Form S-4 (File No. 333-226594 as filed with the SEC on August 3, 2018).
10.30†	Indemnification Agreement dated October 17, 2016, by and between Ruga Corporation and Vinay Shah (Incorporated herein by reference to Exhibit 10.8 of our registration statement on Form S-4 (File No. 333-226594 as filed with the SEC on August 3, 2018).
10.31	Sublease dated August 21, 2018, by and among Versartis, Inc. and Eva Automation, Inc. (Incorporated herein by reference to Exhibit 10.1 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on September 20, 2018).
10.32*	Aravive, Inc. 2017 Equity Incentive Plan (Incorporated herein by reference to Exhibit 4.9 of our registration statement on Form S-8 (File No. 333-227865), as filed with the SEC on October 17, 2018).
10.33*	Aravive, Inc. 2010 Equity Incentive Plan, as amended (Incorporated herein by reference to Exhibit 4.10 of our registration statement on Form S-8 (File No. 333-227865), as filed with the SEC on October 17, 2018).
10.34*	Separation Agreement with Paul Westberg effective November 15, 2018 (Incorporated herein by reference to Exhibit 10.1 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on November 20, 2018).
10.35*	Separation Agreement with Tracy Woody effective November 15, 2018 (Incorporated herein by reference to Exhibit 10.2 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on November 20, 2018).
10.36*	Amendment to Jay Shepard Offer Letter dated as of February 6, 2019 (Incorporated herein by reference to Exhibit 10.1 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on February 12, 2019).
10.37*	Offer Letter dated February 1, 2017 and the amendment thereto dated May 30, 2018 by and between Aravive Biologics, Inc. and Vinay Shah (Incorporated herein by reference to Exhibit 10.2 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on February 12, 2019).
10.38*	Severance Agreement dated May 31, 2018 and amendment thereto dated September 24, 2018 between Aravive Biologics, Inc. and Vinay Shah (Incorporated herein by reference to Exhibit 10.3 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on February 12, 2019).
10.39*	Offer Letter dated January 1, 2017 by and between Aravive Biologics, Inc. and Gail McIntyre (Incorporated herein by reference to Exhibit 10.4 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on February 12, 2019).
10.40*	Non-Employee Director Compensation Policy, as amended January 3, 2019 (Incorporated herein by reference to exhibit number 10.60 on our annual report on Form 10-K (File No. 001-36361), as filed with the SEC on March 15, 2019).
10.41*	Amendment to Jay Shepard Offer Letter effective as of February 28, 2019 (Incorporated herein by reference to Exhibit 10.1 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on March 6, 2019).
10.42*	First Amendment to Aravive, Inc. 2014 Equity Incentive Plan (Incorporated herein by reference to Exhibit 10.2 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on March 6, 2019).
10.43*	Offer Letter, dated January 8, 2020, between Rekha Hemrajani and Aravive, Inc. (Incorporated herein by reference to Exhibit 10.1 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on January 9, 2020).

Exhibit Number	Description
10.44*	Separation Agreement, dated January 9, 2020, between Jay Shepard and Aravive, Inc. (Incorporated herein by reference to Exhibit 10.3 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on January 9, 2020).
10.45	Consulting Agreement, dated January 9, 2020, between Jay Shepard and Aravive, Inc. (Incorporated herein by reference to Exhibit 10.4 of our current report on Form 8-K (File No. 001-36361 as filed with the SEC on January 9, 2020).
10.46*	Aravive, Inc. 2019 Equity Incentive Plan (Incorporated herein by reference to Exhibit 99.1 of our registration statement on Form S-8 (File No. 333-233866), as filed with the SEC on September 20, 2019).
10.47*	Form of Stock Option Grant Notice and Stock Option Agreement (Incorporated herein by reference to Exhibit 99.2 of our registration statement on Form S-8 (File No. 333-233866), as filed with the SEC on September 20, 2019).
10.48#*	Offer Letter, dated March 26, 2020, between Vinay Shah and Aravive, Inc.
10.49#*	Offer Letter, dated March 26, 2020 between Gail McIntyre and Aravive, Inc.
10.50#*	Form of 2019 Equity Incentive Plan Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement.
21.1#	List of Subsidiaries.
23.1#	Consent of BDO USA, LLP.
24.1#	Power of Attorney (included in the signature page hereto).
31.1#	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2#	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1#	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2#	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

Filed herewith
† Registrant has been granted confidential treatment for certain portions of this agreement. The omitted portions have been filed separately with the SEC.
* Indicates management contract or compensatory plan.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized**.**

Aravive, Inc.

Date: March 27, 2020

By: /s/ Rekha Hemrajani

Rekha Hemrajani
Chief Executive Officer and President
(Principal Executive Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Report has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Rekha Hemrajani and Vinay Shah, and each of them, his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments to this report, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or either of them, or their or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

Signature	Title	Date
/s/ Rekha Hemrajani Rekha Hemrajani	Chief Executive Officer, President and Director (Principal Executive Officer)	March 27, 2020
/s/ Vinay Shah Vinay Shah	Chief Financial Officer (Principal Financial Officer & Principal Accounting Officer)	March 27, 2020
/s/ Srinivas Akkaraju, M.D., Ph.D. Srinivas Akkaraju, M.D., Ph.D.	Director	March 27, 2020
/s/ Amato Giaccia, Ph. D. Amato Giaccia, Ph. D.	Director	March 27, 2020
/s/ Robert E. Hoffman Robert E. Hoffman	Director	March 27, 2020
/s/ Ray Tabibiazar, M.D. Ray Tabibiazar, M.D.	Director	March 27, 2020
/s/ Jay P. Shepard Jay P. Shepard	Director (Chairman of the Board)	March 27, 2020
/s/ Eric Zhang Eric Zhang	Director	March 27, 2020

Exhibit 4.2

DESCRIPTION OF SECURITIES
REGISTERED PURSUANT TO SECTION 12 OF THE
SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

As of December 31, 2019, Aravive, Inc. ("we," "us," and "our") had one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), which is our common stock, par value $0.0001 per share (the "common stock").

General

The following is a description of the material terms of our common stock. This is a summary only and does not purport to be complete. It is subject to and qualified in its entirety by reference to our Amended and Restated Certificate of Incorporation, as amended (the "Certificate of Incorporation"), and our Amended and Restated Bylaws, each of which are incorporated by reference as an exhibit to our Annual Report on Form 10-K for the fiscal year ended December 31, 2019, of which this Exhibit 4.2 is a part. We encourage you to read our Certificate of Incorporation, our Bylaws and the applicable provisions of the Delaware General Corporation Law, for additional information.

Description of Common Stock

Authorized Shares of Common Stock. We currently have authorized 100,000,000 shares of common stock. As of March 16, 2020, we had 15,015,932 issued and outstanding shares of common stock.

Voting Rights. Each holder of our common stock is entitled to one vote for each share of common stock held on all matters submitted to a vote of stockholders, except as otherwise required by statute. Except as otherwise provided by statute or by applicable stock exchange rules, in all matters other than the election of directors, stockholders may take action with the affirmative vote of the majority of shares present in person, by remote communication, if applicable, or represented by proxy at a stockholder meeting and entitled to vote generally on the subject matter. Cumulative voting for the election of directors is not provided for in our amended and restated certificate of incorporation. Except as otherwise provided by statute, stockholders may elect directors by a plurality of the votes of the shares present in person, by remote communication, if applicable.

Dividends. Subject to preferences that may apply to any shares of preferred stock outstanding at the time, the holders of outstanding shares of our common stock are entitled to receive dividends out of funds legally available at the times and in the amounts that our board of directors may determine.

Liquidation Rights. Upon our liquidation, dissolution or winding-up, the assets legally available for distribution to our stockholders would be distributable ratably among the holders of our common stock and any participating convertible preferred stock outstanding at that time after payment of liquidation preferences, on any outstanding shares of convertible preferred stock and payment of other claims of creditors.

Rights and Preferences. The rights, preferences, and privileges of holders of our common stock are subject to, and may be adversely affected by, the rights of holders of shares of any series of preferred stock that we may designate and issue in the future.

Preemptive or Similar Rights. Our common stock is not entitled to preemptive rights and is not subject to conversion or redemption.

Fully Paid and Nonassessable. All of our issued and outstanding shares of common stock are fully paid and nonassessable.

Anti-Takeover Effects of Our Charter Documents and Some Provisions of Delaware Law

Delaware Law

We are incorporated in the State of Delaware. As a result, we are subject to Section 203 of the Delaware General Corporation Law, which prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years after the date that such stockholder became an interested stockholder, with the following exceptions:

- before such date, the board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;
- upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction began, excluding for purposes of determining the voting stock outstanding (but not the outstanding voting stock owned by the interested stockholder) those shares owned (1) by persons who are directors and also officers and (2) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or after such date, the business combination is approved by the board of directors and authorized at an annual or special meeting of the stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock that is not owned by the interested stockholder.

In general, Section 203 defines a "business combination" to include the following:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition of 10% or more of the assets of the corporation involving the interested stockholder;
- subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits by or through the corporation.

In general, Section 203 defines an "interested stockholder" as an entity or person who, together with the person's affiliates and associates, beneficially owns, or within three years prior to the time of determination of interested stockholder status did own, 15% or more of the outstanding voting stock of the corporation. A Delaware corporation may "opt out" of these provisions with an express provision in its certificate of incorporation. We have not opted out of these provisions, which may as a result, discourage or prevent mergers or other takeover or change of control attempts of us.

Certificate of Incorporation and Bylaws

Our Certificate of Incorporation provides for our board of directors to be divided into three classes with staggered three-year terms. Only one class of directors is elected at each annual meeting of our stockholders, with the other classes continuing for the remainder of their respective three-year terms. Because our stockholders do not have cumulative voting rights, stockholders holding a majority of the shares of common stock outstanding are able to elect all of our directors. Our Certificate of Incorporation and our Bylaws also provide that directors may be removed by the stockholders only for cause upon the vote of 66 2/3% of our outstanding common stock. Furthermore, the authorized number of directors may be changed only by resolution of the board of directors, and vacancies and newly created directorships on the board of directors may, except as otherwise required by law or determined by the board, only be filled by a majority vote of the directors then serving on the board, even though less than a quorum.

Our Certificate of Incorporation and Bylaws also provide that all stockholder actions must be effected at a duly called meeting of stockholders and eliminates the right of stockholders to act by written consent without a meeting. Our Bylaws also provide that only our chairman of the board, chief executive officer or the board of directors pursuant to a resolution adopted by a majority of the total number of authorized directors may call a special meeting of stockholders.

Our Bylaws also provide that stockholders seeking to present proposals before a meeting of stockholders to nominate candidates for election as directors at a meeting of stockholders must provide timely advance notice in writing, and specify requirements as to the form and content of a stockholder's notice.

Our Certificate of Incorporation and Bylaws provide that the stockholders cannot amend many of the provisions described above except by a vote of 66 2/3% or more of our outstanding common stock.

The combination of these provisions makes it more difficult for our existing stockholders to replace our board of directors as well as for another party to obtain control of us by replacing our board of directors. Since our board of directors has the power to retain and discharge our officers, these provisions could also make it more difficult for existing stockholders or another party to effect a change in management. In addition, the authorization of undesignated preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change our control.

These provisions are intended to enhance the likelihood of continued stability in the composition of our board of directors and its policies and to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to reduce our vulnerability to hostile takeovers and to discourage certain tactics that may be used in proxy fights. However, such provisions could have the effect of discouraging others from making tender offers for our shares and may have the effect of delaying changes in our control or management. As a consequence, these provisions may also inhibit fluctuations in the market price of our stock that could result from actual or rumored takeover attempts. We believe that the benefits of these provisions, including increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure our company, outweigh the disadvantages of discouraging takeover proposals, because negotiation of takeover proposals could result in an improvement of their terms.

Choice of Forum

Our Certificate of Incorporation provides that the Court of Chancery of the State of Delaware will be the exclusive forum for:

- any derivative action or proceeding brought on our behalf;
- any action asserting a breach of fiduciary duty; any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our certificate of incorporation or our bylaws; or
- any action asserting a claim against us that is governed by the internal affairs doctrine.

A Delaware corporation is allowed to mandate in its corporate governance documents a chosen forum for the resolution of state law based shareholder class actions, derivative suits and other intra-corporate disputes.

This exclusive forum provision does not apply to suits brought to enforce any liability or duty created by the Securities Act or the Exchange Act or other federal securities laws for which there is exclusive federal or concurrent federal and state jurisdiction.

Our management believes limiting state law based claims to Delaware will provide the most appropriate outcomes as the risk of another forum misapplying Delaware law is avoided, Delaware courts have a well-developed body of case law and limiting the forum will preclude costly and duplicative litigation and avoids the risk of inconsistent outcomes. Additionally, Delaware Chancery Courts can typically resolve disputes on an accelerated schedule when compared to other forums.

While management believes limiting the forum for state law based claims is a benefit, shareholders could be inconvenienced by not being able to bring a state law based action in another forum they find favorable.

Several lawsuits involving other companies have been brought challenging the validity of choice of forum provisions in certificates of incorporation, and it is possible that a court could note such provision is inapplicable or unenforceable.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC. The transfer agent's address is 6201 15th Avenue, Brooklyn, New York 11219.

Listing on the Nasdaq Global Select Market

Our common stock is listed on the Nasdaq Global Select Market under the symbol "ARAV."

Exhibit 10.48

River Oaks Tower
3730 Kirby Drive, Suite 1200
Houston, Texas 77098

March 26, 2020

Vinah Shah
(via email ####)

Dear Vinay:

Aravive, Inc. (the "Company") is pleased to offer you the continued position of Chief Financial Officer of the Company on the following terms:

1. **Position**.

(a) You will continue to be employed as Chief Financial Officer ("CFO") of the Company and you will report to the Company's Chief Executive Officer. This is a full-time position. By signing this letter agreement, you confirm to the Company that you have no contractual commitments or other legal obligations that would prohibit you from performing your duties for the Company.

(b) You agree to the best of your ability and experience that you will at all times loyally and conscientiously perform all of the duties and obligations required of and from you pursuant to the express and implicit terms hereof, and to the reasonable satisfaction of the Company. During your employment, you further agree that you will devote all of your business time and attention to the business of the Company, the Company will be entitled to all of the benefits and profits arising from or incidental to all such work services and advice, you will not render commercial or professional services of any nature to any person or organization, whether or not for compensation, without the prior written consent of the Company, and you will not directly or indirectly engage or participate in any business that is competitive in any manner with the business of the Company. Nothing in this letter agreement will prevent you from accepting speaking or presentation engagements in exchange for honoraria or from serving on boards of charitable organizations or public or private corporations that are not competitive in any manner with the business of the Company, or from owning no more than one percent (1%) of the outstanding equity securities of a corporation whose stock is listed on a national stock exchange.

2. **Effective Date.** This offer letter is effective as of March 1, 2020 (the "Effective Date").

3. **Cash Compensation**. The Company will pay you a salary at the rate of Three Hundred Sixty Thousand Dollars ($360,000) per year, less required deductions and withholdings, payable in accordance with the Company's standard payroll schedule. This salary will be subject to adjustment pursuant to the Company's employee compensation policies in effect from time to time. As an exempt salaried employee, you will be expected to work hours as required by the nature of your work assignments, including hours beyond the Company's normal business hours, and you will not be eligible for, nor entitled to receive, overtime compensation.

In addition, you will be eligible to be considered for a discretionary incentive bonus for each fiscal year of the Company. Whether you are awarded any bonus for a given fiscal year, and the amount of the bonus (if any), will be determined by the Company in its sole discretion based upon achievement of Company and personal objectives established and approved by the Company's Board of Directors. For fiscal year 2020 your target bonus will be equal to 40% of your annual base salary ("Target Bonus"). Any bonus for a fiscal year will be paid within 2½ months after the close of that fiscal year, and you must remain actively employed by the Company at the time of payment in order to earn a bonus for that fiscal year. The Target Bonus is not earned until paid and no pro-rated amount will be paid if your employment terminates prior to the payment date; provided, however, in the event the Company terminates your employment for any reason other than Cause or Permanent Disability (as defined below) you will be entitled to receive a pro-rated portion of the discretionary year-end Target Bonus contingent upon a determination by the Board of Directors regarding which corporate goals of the Company have been met and that the other executive officers of the Company have been paid their year-end target bonuses. The determination of the Company's Board of Directors with respect to your bonus will be final and binding.

The Company may change your compensation and benefits from time to time at its discretion.

5. **Employee Benefits**. As a regular employee of the Company, you will be eligible to continue to participate in a number of Company-sponsored benefits, including its medical, dental and 401(k) plans, under the terms and conditions of the benefit plans that may be in effect from time to time. In addition, you will be entitled to a number of vacation days and to accrue and use paid vacation benefits, in accordance with the Company's vacation policy, as in effect from time to time (initially for the first eleven months you will accrue a maximum of 120 hours of paid time off).

6. **Severance Benefits.**

(a) **Termination For Any Reason Other Than Cause Or Permanent Disability Not In Connection With A Change of Control.** If the Company terminates your employment for any reason other than Cause or Permanent Disability (both as defined herein) and a Separation occurs, and the Separation is not in connection with a Change of Control, then you will be entitled to the benefits described in Sections 6 (i)-(iv)below; ***any severance payments contemplated by Section 6(a)(i) – 6(a)(v) below are conditioned on*** you (i) returning all Company property and confidential information in your possession on or within seven (7) days of the Separation and (ii) on or within sixty (60) days after the Separation ("Release Deadline") executing a general release of all known and unknown claims that you may have against the Company or persons affiliated with the Company in the form prescribed by the Company, without alterations, and you allow such release to become fully effective. ("Release"). If the Release does not become effective by the Release Deadline, you will forfeit any rights to severance or benefits under this Section 6 or elsewhere in this Agreement.

(i) **Salary Continuation.** The Company will continue to pay your base salary for a period of nine (9) months after your Separation, less required deductions and withholdings ("Salary Continuation"). The Salary Continuation will be paid at the base salary rate in effect at the time of your Separation and in accordance with the Company's standard payroll procedures. The Salary Continuation payments will commence within thirty (30) days after the Release Deadline and, once they commence, will be retroactive to the date of your Separation.

(ii) **COBRA**. If you elect to continue your health insurance coverage under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") following your Separation, then the Company will reimburse your monthly premium under COBRA until the earliest of: (i) the close of the twelve-month period following your Separation, (ii) the expiration of your continuation coverage under COBRA; or (iii) the date when you commence new employment or substantial self-employment and you

agree to inform the Company immediately in such event, provided you timely elect and pay for COBRA coverage. COBRA reimbursements shall be made by the Company to you consistent with the Company's normal expense reimbursement policy, provided that you submit documentation to the Company substantiating your payments for COBRA coverage. The first COBRA reimbursement payment will be made within thirty (30) days after the Release Deadline.

(iii) **Accelerated Vesting.** If vesting does not accelerate under your equity awards, then the Company will accelerate the vesting of the number of shares subject to options and RSUs that would have vested in the twelve (12) month period after your Separation, such that, effective as immediately prior to the Separation date, you will be considered to have vested in all options and the RSUs granted to you through, and no later than twelve (12) months following the date of the Separation.

(iv) **Exercise of Option.** Effective as immediately prior to the Separation date, the Company agrees to extend the period of time for you to exercise any vested shares subject to options until the earlier of (i) the expiration date of the applicable option, or (ii) nine (9) months after your Separation date.

(b) **Termination in Connection with a Change in Control.** You will be eligible for severance benefits for a termination in connection with a Change in Control, under the Company's Change in Control Severance Plan (the "Change in Control Severance Plan"), which provides specified severance benefits to certain eligible officers and employees of the Company. In addition, if during the twelve month period commencing on the closing date of a Change in Control the Company terminates your employment for any reason other than Cause or Permanent Disability and a Separation occurs, all unvested equity awards shall immediately vest so long as there has been no event that would result in a termination of benefits under Section 3(b) of the Change of Control Severance Plan. All rights and obligations with respect to your Severance Benefits in connection with a Change in Control will be as set forth in the Change in Control Severance Plan. If you are provided with any benefits pursuant to the Change in Control Severance Plan, you will not receive any severance benefits as specified in Section 6(a) herein.

7. **Confidential Information and Inventions Assignment/Company Policies**. Employee Confidential Information and Inventions Assignment Agreement you have signed with the Company or any of its subsidiaries shall remain in effect after the Effective Date. In addition, you will be expected to abide by Company rules and policies and acknowledge in writing that you have read the Company's Employee Handbook.

9. **Employment Relationship**. Employment with the Company is for no specific period of time. Your employment with the Company will be "at will," meaning that either you or the Company may terminate your employment at any time and for any reason, with or without cause or advance notice subject to the restrictions set forth in Section 6. Any contrary representations that may have been made to you are superseded by this letter agreement. This is the full and complete agreement between you and the Company on this term. Although your job duties, title, compensation and benefits, as well as the Company's personnel policies and procedures, may change from time to time, the "at will" nature of your employment may only be changed in an express written agreement signed by you and a duly authorized officer of the Company (other than you).

10. **Tax Matters.**

(a) **Withholding.** All forms of compensation referred to in this letter agreement are subject to reduction to reflect applicable withholding and payroll taxes and other deductions required by law.

(b) **Section 409A.** For purposes of Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), each salary continuation payment under Section 7(a)(i) is hereby designated as a separate payment. If the Company determines that you are a "specified employee" under Section 409A(a)(2)(B)(i) of the Code at the time of your Separation, then the salary continuation payments under Section 5(b), to the extent that they are subject to Section 409A of the Code, will commence during the seventh month after your Separation and the installments that otherwise would have been paid during the first six months after your Separation will be paid in a lump sum when the salary continuation payments commence.

(c) **Tax Advice.** You are encouraged to obtain your own tax advice regarding your compensation from the Company. You agree that the Company does not have a duty to design its compensation policies in a manner that minimizes your tax liabilities, and you will not make any claim against the Company or the Board of Directors related to tax liabilities arising from your compensation.

11. **No Conflicting Obligations.** You understand and agree that by accepting this offer of continued employment, you represent to the Company that your performance will not breach any other agreement to which you are a party and that you have not, and will not during the term of your employment with the Company, enter into any oral or written agreement in conflict with any of the provisions of this letter or the Company's policies. You are not to bring with you to the Company, or use or disclose to any person associated with the Company, any confidential or proprietary information belonging to any former employer or other person or entity with respect to which you owe an obligation of confidentiality under any agreement or otherwise. The Company does not want or need and will not use such information, will assist you to preserve and protect the confidentiality of proprietary information belonging to third parties, and expects you to use in performing your duties for the Company only information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. Also, we expect you to abide by any obligations to refrain from soliciting any person employed by or otherwise associated with any former employer and suggest that you refrain from having any contact with such persons until such time as any non-solicitation obligation expires.

12. **Definitions.** The following terms have the meaning set forth below wherever they are used in this letter agreement:

(a) **"Cause"** means any one or more of the following events: (a) your conviction (including a guilty plea or a no contest plea) of a felony, or of any other crime involving fraud, dishonesty or moral turpitude; (ii) your conviction of or participation in a fraud or act of material dishonesty against the Company; (iii) your intentional, material breach of any contract or agreement between you and the Company (including but not limited to your Proprietary Information and Invention Agreement or any other restrictive covenant agreements) or material breach or material neglect of any statutory or fiduciary duty you owe to the Company as reasonably determined by the Board of Directors, in each case, after having provided you with not less than thirty (30) days written notice of same and with the opportunity to cure of the same duration to the extent curable; (iv) your unauthorized use or disclosure of the Company's confidential information or trade secrets; or (v) your conduct that constitutes gross misconduct, conduct that constitutes gross insubordination, incompetence or habitual neglect of your duties that results in (or might have reasonably resulted in) material harm to the business of the Company, each as reasonably determined by the Board of Directors, in each case, after having provided you with not less than thirty (30) days written notice of same and with the opportunity to cure of the same duration to the extent curable.

(b) **"Change in Control"** means a "Change in Control" as defined in the Company's 2019 Equity Incentive Plan, as may be amended from time to time.

(c) **"Permanent Disability"** means that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least 120 consecutive days because of a physical or mental impairment.

(d) **"Separation"** means a "separation from service," as defined in the regulations under Section 409A of the Code.

13. **Dispute Resolution.** To ensure rapid and economical resolution of any disputes which may arise under this Agreement, you and the Company agree that any and all claims, disputes or controversies of any nature whatsoever arising from or regarding the interpretation, performance, negotiation, execution, enforcement or breach of this Agreement, your employment with the Company, or the termination of your employment from the Company, including but not limited to statutory claims, shall be resolved pursuant to the Federal Arbitration Act, 9 U.S.C. § 1-16, to the fullest extent permitted by law, by confidential, final and binding arbitration conducted before a single arbitrator with JAMS, Inc. ("JAMS") in, San Francisco, California, in accordance with JAMS' then-applicable arbitration rules, which can be found at http://www.jamsadr.com/rules-clauses/, and which will be provided to you upon request. **The parties acknowledge that by agreeing to this arbitration procedure, they waive the right to resolve any such dispute through a trial by jury, judge or administrative proceeding.** This paragraph shall not apply to any action or claim that cannot be subject to mandatory arbitration as a matter of law, including, without limitation, claims brought pursuant to the California Private Attorneys General Act of 2004, as amended, the California Fair Employment and Housing Act, as amended, and the California Labor Code, as amended, to the extent such claims are not permitted by applicable law(s) to be submitted to mandatory arbitration and the applicable law(s) are not preempted by the Federal Arbitration Act or otherwise invalid (collectively, the "Excluded Claims"). In the event you intend to bring multiple claims, including one of the Excluded Claims listed above, the Excluded Claims may be filed with a court, while any other claims will remain subject to mandatory arbitration. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator shall be authorized to award all relief that you or the Company would be entitled to seek in a court of law. The Company shall pay all JAMS arbitration fees in excess of the administrative fees that you would be required to pay if the dispute were decided in a court of law. Nothing in this Agreement shall prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration. The Company shall pay all filing fees in excess of those which would be required if the dispute were decided in a court of law, and shall pay the arbitrator's fees and any other fees or costs unique to arbitration. Any awards or orders in such arbitrations may be entered and enforced as judgments in the federal and state courts of any competent jurisdiction.

14. **Interpretation, Amendment and Enforcement**. This letter agreement, together with the Employee Confidential Information and Inventions Assignment Agreement, constitutes the complete agreement between you and the Company, contains all of the terms of your employment with the Company and supersedes any prior agreements, representations or understandings (whether written, oral or implied) between you and the Company. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other agreements, promises, warranties or representations concerning its subject matter. Changes in your employment terms, other than those changes expressly reserved to the Company's discretion in this letter, require an express written modification signed by both you and a duly authorized officer of the Company. If any provision of this offer letter agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this offer letter agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This letter may be delivered and executed via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, Uniform Electronic Transactions Act or other applicable law) or other transmission method and shall be deemed to have been duly and validly delivered and executed and be valid and effective for all purposes.

We hope that you will accept our offer to join the Company. You may indicate your agreement with these terms and accept this offer by signing and dating both the enclosed duplicate original of this letter agreement and the enclosed Confidential Information and Inventions Agreement and returning them to me.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

ARAVIVE INC.

/s/ Rekha Hemrajani

Rekha Hemrajani
President and Chief Executive Officer

I have read and accept this employment offer:

/s/ Vinay Shah
Signature

Printed Name:
Vinay Shah

Dated: March 26, 2020

EXHIBIT 1 - EMPLOYEE CONFIDENTIAL INFORMATION AND INVENTIONS ASSIGNMENT AGREEMENT

In consideration of my employment or continued employment by Aravive, Inc. ("Company"), and the compensation paid to me now and during my employment with the Company, I agree to the terms of this Agreement as follows:

1. CONFIDENTIAL INFORMATION PROTECTIONS.

1.1 **Nondisclosure; Recognition of Company's Rights**. At all times during and after my employment, I will hold in confidence and will not disclose, use, lecture upon, or publish any of Company's Confidential Information (defined below), except as may be required in connection with my work for Company, or as expressly authorized by the Chairman of the Board (the "Chairman") of Company. I will obtain the Chairman's written approval before publishing or submitting for publication any material (written, oral, or otherwise) that relates to my work at Company and/or incorporates any Confidential Information. I hereby assign to Company any rights I may have or acquire in any and all Confidential Information and recognize that all Confidential Information shall be the sole and exclusive property of Company and its assigns.

1.2 **Confidential Information**. The term "Confidential Information" shall mean any and all confidential knowledge, data or information related to Company's business or its actual or demonstrably anticipated research or development, including without limitation (a) trade secrets, inventions, ideas, processes, computer source and object code, data, formulae, programs, other works of authorship, know-how, improvements, discoveries, developments, designs, and techniques; (b) information regarding products, services, plans for research and development, marketing and business plans, budgets, financial statements, contracts, prices, suppliers, and customers; (c) information regarding the skills and compensation of Company's employees, contractors, and any other service providers of Company; and (d) the existence of any business discussions, negotiations, or agreements between Company and any third party.

1.3 **Third Party Information**. I understand that Company has received and, in the future, will receive from third parties confidential or proprietary information ("Third Party Information") subject to a duty on Company's part to maintain the confidentiality of such information and to use it only for certain limited purposes. During and after the term of my employment, I will hold Third Party Information in strict confidence and will not disclose to anyone (other than Company personnel who need to know such information in connection with their work for Company) or use, Third Party Information, except in connection with my work for Company or unless expressly authorized by an officer of Company in writing.

1.4 **No Improper Use of Information of Prior Employers and Others**. I represent that my employment by Company does not and will not breach any agreement with any former employer, including any non-compete or non-solicitation agreement or any agreement to keep in confidence or refrain from using information acquired by me prior to my employment by Company. I further represent that I have not entered into, and will not enter into, any agreement, either written or oral, in conflict with my obligations under this Agreement. During my employment by Company, I will not improperly make use of, or disclose, any information or trade secrets of any former employer or other third party, nor will I bring onto the premises of Company or use any unpublished documents or any property belonging to any former employer or other third party, in violation of any lawful agreements with that former employer or third party. I will use in the performance of my duties only information that is generally known and used by persons with training and experience comparable to my own, is common knowledge in the industry or otherwise legally in the public domain, or is otherwise provided or developed by Company.

2. **INVENTIONS**.

2.1 **Definitions**. As used in this Agreement, the term "Invention" means any ideas, concepts, information, materials, processes, data, programs, know-how, improvements, discoveries, developments, designs, artwork, formulae, other copyrightable works, and techniques and all Intellectual Property Rights in any of the items listed above. The term "Intellectual Property Rights" means all trade secrets, copyrights, trademarks, mask work rights, patents and other intellectual property rights recognized by the laws of any jurisdiction or country. The term "Moral Rights" means all paternity, integrity, disclosure, withdrawal, special and any other similar rights recognized by the laws of any jurisdiction or country.

2.2 **Prior Inventions**. I have disclosed on Exhibit A a complete list of all Inventions that (a) I have, or I have caused to be, alone or jointly with others, conceived, developed, or reduced to practice prior to the commencement of my employment by Company; (b) in which I have an ownership interest or which I have a license to use; (c) and that I wish to have excluded from the scope of this Agreement (collectively referred to as "Prior Inventions"). If no Prior Inventions are listed in Exhibit A, I warrant that there are no Prior Inventions. I agree that I will not incorporate, or permit to be incorporated, Prior Inventions in any Company Inventions (defined below) without Company's prior written consent. If, in the course of my employment with Company, I incorporate a Prior Invention into a Company process, machine or other work, I hereby grant Company a non-exclusive, perpetual, fully-paid and royalty-free, irrevocable and worldwide license, with rights to sublicense through multiple levels of sublicensees, to reproduce, make derivative works of, distribute, publicly perform, and publicly display in any form or medium, whether now known or later developed, make, have made, use, sell, import, offer for sale, and exercise any and all present or future rights in, such Prior Invention.

2.3 **Assignment of Company Inventions**. Inventions assigned to the Company or to a third party as directed by the Company pursuant to the subsection titled Government or Third Party are referred to in this Agreement as "Company Inventions." Subject to the subsection titled Government or Third Party and except for Inventions that I can prove qualify fully under the provisions of California Labor Code section 2870 and I have set forth in Exhibit A, I hereby assign and agree to assign in the future (when any such Inventions or Intellectual Property Rights are first reduced to practice or first fixed in a tangible medium, as applicable) to Company all my right, title, and interest in and to any and all Inventions (and all Intellectual Property Rights with respect thereto) made, conceived, reduced to practice, or learned by me, either alone or with others, during the period of my employment by Company. Any assignment of Inventions (and all Intellectual Property Rights with respect thereto) hereunder includes an assignment of all Moral Rights. To the extent such Moral Rights cannot be assigned to Company and to the extent the following is allowed by the laws in any country where Moral Rights exist, I hereby unconditionally and irrevocably waive the enforcement of such Moral Rights, and all claims and causes of action of any kind against Company or related to Company's customers, with respect to such rights. I further acknowledge and agree that neither my successors-in-interest nor legal heirs retain any Moral Rights in any Inventions (and any Intellectual Property Rights with respect thereto).

2.4 **Obligation to Keep Company Informed**. During the period of my employment and for one (1) year after my employment ends, I will promptly and fully disclose to Company in writing (a) all Inventions authored, conceived, or reduced to practice by me, either alone or with others, including any that might be covered under California Labor Code section 2870, and (b) all patent applications filed by me or in which I am named as an inventor or co-inventor.

2.5 **Government or Third Party**. I agree that, as directed by the Company, I will assign to a third party, including without limitation the United States, all my right, title, and interest in and to any particular Company Invention.

2.6 **Enforcement of Intellectual Property Rights and Assistance**. During and after the period of my employment and at Company's request and expense, I will assist Company in every proper way, including consenting to and joining in any action, to obtain and enforce United States and foreign Intellectual Property Rights and Moral Rights relating to Company Inventions in all countries. If the Company is unable to secure my signature on any document needed in connection with such purposes, I hereby irrevocably designate and appoint Company and its duly authorized officers and agents as my agent and attorney in fact, which appointment is coupled with an interest, to act on my behalf to execute and file any such documents and to do all other lawfully permitted acts to further such purposes with the same legal force and effect as if executed
by me.

2.7 **Incorporation of Software Code**. I agree that I will not incorporate into any Company software or otherwise deliver to Company any software code licensed under the GNU General Public License or Lesser General Public License or any other license that, by its terms, requires or conditions the use or distribution of such code on the disclosure, licensing, or distribution of any source code owned or licensed by Company.

2.8 **Unassigned or Nonassignable Inventions.** I recognize that this Agreement will not be deemed to require assignment of any Invention that is covered under California Labor Code section 2870(a) provided that nothing herein shall forbid or restrict the right of the Company to provide for full title to certain patents and Inventions to be in the United States, as required by contracts between the Company and the United States or any of its agencies.

3. **RECORDS**. I agree to keep and maintain adequate and current records (in the form of notes, sketches, drawings and in any other form that is required by the Company) of all Inventions made by me during the period of my employment by the Company, which records shall be available to, and remain the sole property of, the Company at all times.

4. **ADDITIONAL ACTIVITIES**. I agree that during the term of my employment by Company, I will not (a) without Company's express written consent, engage in any employment or business activity that is competitive with, or would otherwise conflict with my employment by, Company; and (b) for the period of my employment by Company and for one (1) year thereafter, I will not either directly or indirectly, solicit or attempt to solicit any employee, independent contractor, or consultant of Company to terminate his, her or its relationship with Company in order to become an employee, consultant, or independent contractor to or for any other person or entity.

5. **RETURN OF COMPANY PROPERTY**. Upon termination of my employment or upon Company's request at any other time, I will deliver to Company all of Company's property, equipment, and documents, together with all copies thereof, and any other material containing or disclosing any Inventions, Third Party Information or Confidential Information and certify in writing that I have fully complied with the foregoing obligation. I agree that I will not copy, delete, or alter any information contained upon my Company computer or Company equipment before I return it to Company. In addition, if I have used any personal computer, server, or e-mail system to receive, store, review, prepare or transmit any Company information, including but not limited to, Confidential Information, I agree to provide the Company with a computer-useable copy of all such Confidential Information and then permanently delete and expunge such Confidential Information from those systems; and I agree to provide the Company access to my system as reasonably requested to verify that the necessary copying and/or deletion is completed. I further agree that any property situated on Company's premises and owned by Company is subject to inspection by Company's personnel at any time with or without notice. Prior to the termination of my employment or promptly after termination of my employment, I will cooperate with Company in attending an exit interview and certify in writing that I have complied with the requirements of this section.

6. **NOTIFICATION OF NEW EMPLOYER**. If I leave the employ of Company, I consent to the notification of my new employer of my rights and obligations under this Agreement, by Company providing a copy of this Agreement or otherwise.

7. **GENERAL PROVISIONS**.

7.1 **Governing Law and Venue**. This Agreement and any action related thereto will be governed and interpreted by and under the laws of the State of California, without giving effect to any conflicts of laws principles that require the application of the law of a different state. I expressly consent to personal jurisdiction and venue in the state and federal courts for the county in which I primarily perform the services for the Company for any lawsuit filed there against me by Company arising from or related to this Agreement.

7.2 **Severability**. If any provision of this Agreement is, for any reason, held to be invalid or unenforceable, the other provisions of this Agreement will remain enforceable and the invalid or unenforceable provision will be deemed modified so that it is valid and enforceable to the maximum extent permitted by law.

7.3 **Survival**. This Agreement shall survive the termination of my employment and the assignment of this Agreement by Company to any successor or other assignee and shall be binding upon my heirs and legal representatives.

7.4 **Employment**. I agree and understand that nothing in this Agreement shall give me any right to continued employment by Company, and it will not interfere in any way with my right or Company's right to terminate my employment at any time, with or without cause and with or without advance notice.

7.5 **Notices**. Each party must deliver all notices or other communications required or permitted under this Agreement in writing to the other party at the address listed on the signature page, by courier, by certified or registered mail (postage prepaid and return receipt requested), or by a nationally- recognized express mail service. Notice will be effective upon receipt or refusal of delivery. If delivered by certified or registered mail, notice will be considered to have been given five (5) business days after it was mailed, as evidenced by the postmark. If delivered by courier or express mail service, notice will be considered to have been given on the delivery date reflected by the courier or express mail service receipt. Each party may change its address for receipt of notice by giving notice of the change to the other party.

7.6 **Injunctive Relief**. I acknowledge that, because my services are personal and unique and because I will have access to the Confidential Information of Company, any breach of this Agreement by me would cause irreparable injury to Company for which monetary damages would not be an adequate remedy and, therefore, will entitle Company to injunctive relief (including specific performance). The rights and remedies provided to each party in this Agreement are cumulative and in addition to any other rights and remedies available to such party at law or in equity.

7.7 **Waiver**. Any waiver or failure to enforce any provision of this Agreement on one occasion will not be deemed a waiver of that provision or any other provision on any other occasion.

7.8 **Export**. I agree not to export, reexport, or transfer, directly or indirectly, any U.S. technical data acquired from Company or any products utilizing such data, in violation of the United States export laws or regulations.

7.9 **Counterparts**. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original and all of which shall be taken together and deemed to be one instrument.

7.10 **Entire Agreement**. This Agreement, together with the Exhibits herein and any executed written offer letter between me and the Company, is the final, complete and exclusive agreement of the parties with respect to the subject matter of this Agreement and supersedes and merges all prior discussions between us; provided, however, prior to the execution of this Agreement, if the Company and I were parties to any agreement regarding the subject matter hereof, that agreement will be superseded by this Agreement prospectively only.

7.11 **Advice of Counsel**. I ACKNOWLEDGE THAT, IN EXECUTING THIS AGREEMENT, I HAVE HAD THE OPPORTUNITY TO SEEK THE ADVICE OF INDEPENDENT LEGAL COUNSEL, AND I HAVE READ AND UNDERSTOOD ALL OF THE TERMS AND PROVISIONS OF THIS AGREEMENT. THIS AGREEMENT WILL NOT BE CONSTRUED AGAINST ANY PARTY BY REASON OF THE DRAFTING OR PREPARATION OF THIS AGREEMENT.

7.12 **Protected Activity Not Prohibited**. I understand that nothing in this Agreement limits or prohibits me from filing a charge or complaint with, or otherwise communicating or cooperating with or participating in any investigation or proceeding that may be conducted by, any federal, state or local government agency or commission, including the Securities and Exchange Commission, the Equal Employment Opportunity Commission, the Occupational Safety and Health Administration, and the National Labor Relations Board ("Government Agencies"), including disclosing documents or other information as permitted by law, without giving notice to, or receiving authorization from, the Company, discussing the terms and conditions of my employment with others to the extent expressly permitted by Section 7 of the National Labor Relations Act. Notwithstanding, in making any such disclosures or communications, I agree to take all reasonable precautions to prevent any unauthorized use or disclosure of any information that may constitute Company Confidential Information to any parties other than the Government Agencies. I further understand that I am not permitted to disclose the Company's attorney-client privileged communications or attorney work product.

This Agreement shall be effective as of the first day of my employment with Company.

EMPLOYEE:	**COMPANY:**
I HAVE READ, UNDERSTAND, AND ACCEPT THIS AGREEMENT AND HAVE BEEN GIVEN THE OPPORTUNITY TO REVIEW IT WITH INDEPENDENT LEGAL COUNSEL.	**ACCEPTED AND AGREED:**
_____	_____
(Signature)	*(Signature)*
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____
Address:	Address:

EXHIBIT A

INVENTIONS

1. Prior Inventions Disclosure. The following is a complete list of all Prior Inventions (as provided in Subsection 2.2 of the attached Employee Confidential Information and Inventions Assignment Agreement, defined herein as the "Agreement"):

☐ None

☐ See immediately below:

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2. Limited Exclusion Notification.

THIS IS TO NOTIFY you in accordance with Section 2872 of the California Labor Code that the foregoing Agreement between you and Company does not require you to assign or offer to assign to Company any Invention that you develop entirely on your own time without using Company's equipment, supplies, facilities or trade secret information, except for those Inventions that either:

a. Relate at the time of conception or reduction to practice to Company's business, or actual or demonstrably anticipated research or development; or

b. Result from any work performed by you for Company.

To the extent a provision in the foregoing Agreement purports to require you to assign an Invention otherwise excluded from the preceding paragraph, the provision is against the public policy of this state and is unenforceable.

This limited exclusion does not apply to any patent or Invention covered by a contract between Company and the United States or any of its agencies requiring full title to such patent or Invention to be in the United States.

Exhibit 10.49

River Oaks Tower
3730 Kirby Drive, Suite 1200
Houston, Texas 77098

March 26, 2020

Gail McIntyre
(via email ####)

Dear Gail:

Aravive, Inc. (the "Company") is pleased to offer you the continued position of Chief Scientific Officer of the Company on the following terms:

1. **Position**.

(a) You will continue to be employed as Chief Scientific ("CSO") of the Company and you will report to the Company's Chief Executive Officer. This is a full-time position. By signing this letter agreement, you confirm to the Company that you have no contractual commitments or other legal obligations that would prohibit you from performing your duties for the Company.

(b) You agree to the best of your ability and experience that you will at all times loyally and conscientiously perform all of the duties and obligations required of and from you pursuant to the express and implicit terms hereof, and to the reasonable satisfaction of the Company. During your employment, you further agree that you will devote all of your business time and attention to the business of the Company, the Company will be entitled to all of the benefits and profits arising from or incidental to all such work services and advice, you will not render commercial or professional services of any nature to any person or organization, whether or not for compensation, without the prior written consent of the Company, and you will not directly or indirectly engage or participate in any business that is competitive in any manner with the business of the Company. Nothing in this letter agreement will prevent you from accepting speaking or presentation engagements in exchange for honoraria or from serving on boards of charitable organizations or public or private corporations that are not competitive in any manner with the business of the Company, or from owning no more than one percent (1%) of the outstanding equity securities of a corporation whose stock is listed on a national stock exchange.

2. **Effective Date.** This offer letter is effective as of March 1, 2020 (the "Effective Date").

3. **Cash Compensation**. The Company will pay you a salary at the rate of Three Hundred Sixty Thousand Dollars ($360,000) per year, less required deductions and withholdings, payable in accordance with the Company's standard payroll schedule. This salary will be subject to adjustment pursuant to the Company's employee compensation policies in effect from time to time. As an exempt salaried employee, you will be expected to work hours as required by the nature of your work assignments, including hours beyond the Company's normal business hours, and you will not be eligible for, nor entitled to receive, overtime compensation.

In addition, you will be eligible to be considered for a discretionary incentive bonus for each fiscal year of the Company. Whether you are awarded any bonus for a given fiscal year, and the amount of the bonus (if any), will be determined by the Company in its sole discretion based upon achievement of Company and personal objectives established and approved by the Company's Board of Directors. For fiscal year 2020 your target bonus will be equal to 40% of your annual base salary ("Target Bonus"). Any bonus for a fiscal year will be paid within 2½ months after the close of that fiscal year, and you must remain actively employed by the Company at the time of payment in order to earn a bonus for that fiscal year. The Target Bonus is not earned until paid and no pro-rated amount will be paid if your employment terminates prior to the payment date; provided, however, in the event the Company terminates your employment for any reason other than Cause or Permanent Disability (as defined below) you will be entitled to receive a pro-rated portion of the discretionary year-end Target Bonus contingent upon a determination by the Board of Directors regarding which corporate goals of the Company have been met and that the other executive officers of the Company have been paid their year-end target bonuses. The determination of the Company's Board of Directors with respect to your bonus will be final and binding.

The Company may change your compensation and benefits from time to time at its discretion.

5. **Employee Benefits**. As a regular employee of the Company, you will be eligible to continue to participate in a number of Company-sponsored benefits, including its medical, dental and 401(k) plans, under the terms and conditions of the benefit plans that may be in effect from time to time. In addition, you will be entitled to a number of vacation days and to accrue and use paid vacation benefits, in accordance with the Company's vacation policy, as in effect from time to time (initially for the first eleven months you will accrue a maximum of 120 hours of paid time off).

6. **Severance Benefits.**

(a) **Termination For Any Reason Other Than Cause Or Permanent Disability Not In Connection With A Change of Control.** If the Company terminates your employment for any reason other than Cause or Permanent Disability (both as defined herein) and a Separation occurs, and the Separation is not in connection with a Change of Control, then you will be entitled to the benefits described in Sections 6 (i)-(iv)below; ***any severance payments contemplated by Section 6(a)(i) – 6(a)(v) below are conditioned on*** you (i) returning all Company property and confidential information in your possession on or within seven (7) days of the Separation and (ii) on or within sixty (60) days after the Separation ("Release Deadline") executing a general release of all known and unknown claims that you may have against the Company or persons affiliated with the Company in the form prescribed by the Company, without alterations, and you allow such release to become fully effective. ("Release"). If the Release does not become effective by the Release Deadline, you will forfeit any rights to severance or benefits under this Section 6 or elsewhere in this Agreement.

(i) **Salary Continuation.** The Company will continue to pay your base salary for a period of nine (9) months after your Separation, less required deductions and withholdings ("Salary Continuation"). The Salary Continuation will be paid at the base salary rate in effect at the time of your Separation and in accordance with the Company's standard payroll procedures. The Salary Continuation payments will commence within thirty (30) days after the Release Deadline and, once they commence, will be retroactive to the date of your Separation.

(ii) **COBRA**. If you elect to continue your health insurance coverage under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") following your Separation, then the Company will reimburse your monthly premium under COBRA until the earliest of: (i) the close of the twelve-month period following your Separation, (ii) the expiration of your continuation coverage under COBRA; or (iii) the date when you commence new employment or substantial self-employment and you agree to inform the Company immediately in such event, provided you timely elect and pay for COBRA coverage. COBRA reimbursements shall be made by the Company to you consistent with the Company's normal expense reimbursement policy, provided that you submit documentation to the Company substantiating your payments for COBRA coverage. The first COBRA reimbursement payment will be made within thirty (30) days after the Release Deadline.

(iii) **Accelerated Vesting.** If vesting does not accelerate under your equity awards, then the Company will accelerate the vesting of the number of shares subject to options and RSUs that would have vested in the twelve (12) month period after your Separation, such that, effective as immediately prior to the Separation date, you will be considered to have vested in all options and the RSUs granted to you through, and no later than twelve (12) months following the date of the Separation.

(iv) **Exercise of Option.** Effective as immediately prior to the Separation date, the Company agrees to extend the period of time for you to exercise any vested shares subject to options until the earlier of (i) the expiration date of the applicable option, or (ii) nine (9) months after your Separation date.

(b) **Termination in Connection with a Change in Control.** You will be eligible for severance benefits for a termination in connection with a Change in Control, under the Company's Change in Control Severance Plan (the "Change in Control Severance Plan"), which provides specified severance benefits to certain eligible officers and employees of the Company. In addition, if during the twelve month period commencing on the closing date of a Change in Control the Company terminates your employment for any reason other than Cause or Permanent Disability and a Separation occurs, all unvested equity awards shall immediately vest so long as there has been no event that would result in a termination of benefits under Section 3(b) of the Change of Control Severance Plan. All rights and obligations with respect to your Severance Benefits in connection with a Change in Control will be as set forth in the Change in Control Severance Plan. If you are provided with any benefits pursuant to the Change in Control Severance Plan, you will not receive any severance benefits as specified in Section 6(a) herein.

7. **Confidential Information and Inventions Assignment/Company Policies**. Employee Confidential Information and Inventions Assignment Agreement you have signed with the Company or any of its subsidiaries shall remain in effect after the Effective Date. In addition, you will be expected to abide by Company rules and policies, and acknowledge in writing that you have read the Company's Employee Handbook.

9. **Employment Relationship**. Employment with the Company is for no specific period of time. Your employment with the Company will be "at will," meaning that either you or the Company may terminate your employment at any time and for any reason, with or without cause or advance notice subject to the restrictions set forth in Section 6. Any contrary representations that may have been made to you are superseded by this letter agreement. This is the full and complete agreement between you and the Company on this term. Although your job duties, title, compensation and benefits, as well as the Company's personnel policies and procedures, may change from time to time, the "at will" nature of your employment may only be changed in an express written agreement signed by you and a duly authorized officer of the Company (other than you).

10. **Tax Matters.**

(a) **Withholding.** All forms of compensation referred to in this letter agreement are subject to reduction to reflect applicable withholding and payroll taxes and other deductions required by law.

(b) **Section 409A.** For purposes of Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), each salary continuation payment under Section 7(a)(i) is hereby designated as a separate payment. If the Company determines that you are a "specified employee" under Section 409A(a)(2)(B)(i) of the Code at the time of your Separation, then the salary continuation payments under Section 5(b), to the extent that they are subject to Section 409A of the Code, will commence during the seventh month after your Separation and the installments that otherwise would have been paid during the first six months after your Separation will be paid in a lump sum when the salary continuation payments commence.

(c) **Tax Advice.** You are encouraged to obtain your own tax advice regarding your compensation from the Company. You agree that the Company does not have a duty to design its compensation policies in a manner that minimizes your tax liabilities, and you will not make any claim against the Company or the Board of Directors related to tax liabilities arising from your compensation.

11. **No Conflicting Obligations.** You understand and agree that by accepting this offer of continued employment, you represent to the Company that your performance will not breach any other agreement to which you are a party and that you have not, and will not during the term of your employment with the Company, enter into any oral or written agreement in conflict with any of the provisions of this letter or the Company's policies. You are not to bring with you to the Company, or use or disclose to any person associated with the Company, any confidential or proprietary information belonging to any former employer or other person or entity with respect to which you owe an obligation of confidentiality under any agreement or otherwise. The Company does not want or need and will not use such information, will assist you to preserve and protect the confidentiality of proprietary information belonging to third parties, and expects you to use in performing your duties for the Company only information which is generally known and used by persons with training and experience comparable to your own, which is common knowledge in the industry or otherwise legally in the public domain, or which is otherwise provided or developed by the Company. Also, we expect you to abide by any obligations to refrain from soliciting any person employed by or otherwise associated with any former employer and suggest that you refrain from having any contact with such persons until such time as any non-solicitation obligation expires.

12. **Definitions.** The following terms have the meaning set forth below wherever they are used in this letter agreement:

(a) **"Cause"** means any one or more of the following events: (a) your conviction (including a guilty plea or a no contest plea) of a felony, or of any other crime involving fraud, dishonesty or moral turpitude; (ii) your conviction of or participation in a fraud or act of material dishonesty against the Company; (iii) your intentional, material breach of any contract or agreement between you and the Company (including but not limited to your Proprietary Information and Invention Agreement or any other restrictive covenant agreements) or material breach or material neglect of any statutory or fiduciary duty you owe to the Company as reasonably determined by the Board of Directors, in each case, after having provided you with not less than thirty (30) days written notice of same and with the opportunity to cure of the same duration to the extent curable; (iv) your unauthorized use or disclosure of the Company's confidential information or trade secrets; or (v) your conduct that constitutes gross misconduct, conduct that constitutes gross insubordination, incompetence or habitual neglect of your duties that results in (or might have reasonably resulted in) material harm to the business of the Company, each as reasonably determined by the Board of Directors, in each case, after having provided you with not less than thirty (30) days written notice of same and with the opportunity to cure of the same duration to the extent curable.

(b) **"Change in Control"** means a "Change in Control" as defined in the Company's 2019 Equity Incentive Plan, as may be amended from time to time.

(c) **"Permanent Disability"** means that you are unable to perform the essential functions of your position, with or without reasonable accommodation, for a period of at least 120 consecutive days because of a physical or mental impairment.

(d) **"Separation"** means a "separation from service," as defined in the regulations under Section 409A of the Code.

13. **Dispute Resolution.** To ensure rapid and economical resolution of any disputes which may arise under this Agreement, you and the Company agree that any and all claims, disputes or controversies of any nature whatsoever arising from or regarding the interpretation, performance, negotiation, execution, enforcement or breach of this Agreement, your employment with the Company, or the termination of your employment from the Company, including but not limited to statutory claims, shall be resolved pursuant to the Federal Arbitration Act, 9 U.S.C. § 1-16, to the fullest extent permitted by law, by confidential, final and binding arbitration conducted before a single arbitrator with JAMS, Inc. ("JAMS") in, San Francisco, California, in accordance with JAMS' then-applicable arbitration rules, which can be found at

http://www.jamsadr.com/rules-clauses/, and which will be provided to you upon request. **The parties acknowledge that by agreeing to this arbitration procedure, they waive the right to resolve any such dispute through a trial by jury, judge or administrative proceeding.** This paragraph shall not apply to any action or claim that cannot be subject to mandatory arbitration as a matter of law, including, without limitation, claims brought pursuant to the California Private Attorneys General Act of 2004, as amended, the California Fair Employment and Housing Act, as amended, and the California Labor Code, as amended, to the extent such claims are not permitted by applicable law(s) to be submitted to mandatory arbitration and the applicable law(s) are not preempted by the Federal Arbitration Act or otherwise invalid (collectively, the "Excluded Claims"). In the event you intend to bring multiple claims, including one of the Excluded Claims listed above, the Excluded Claims may be filed with a court, while any other claims will remain subject to mandatory arbitration. You will have the right to be represented by legal counsel at any arbitration proceeding. The arbitrator shall: (a) have the authority to compel adequate discovery for the resolution of the dispute and to award such relief as would otherwise be available under applicable law in a court proceeding; and (b) issue a written statement signed by the arbitrator regarding the disposition of each claim and the relief, if any, awarded as to each claim, the reasons for the award, and the arbitrator's essential findings and conclusions on which the award is based. The arbitrator shall be authorized to award all relief that you or the Company would be entitled to seek in a court of law. The Company shall pay all JAMS arbitration fees in excess of the administrative fees that you would be required to pay if the dispute were decided in a court of law. Nothing in this Agreement shall prevent either you or the Company from obtaining injunctive relief in court to prevent irreparable harm pending the conclusion of any such arbitration. The Company shall pay all filing fees in excess of those which would be required if the dispute were decided in a court of law, and shall pay the arbitrator's fees and any other fees or costs unique to arbitration. Any awards or orders in such arbitrations may be entered and enforced as judgments in the federal and state courts of any competent jurisdiction.

14. **Interpretation, Amendment and Enforcement**. This letter agreement, together with the Employee Confidential Information and Inventions Assignment Agreement, constitutes the complete agreement between you and the Company, contains all of the terms of your employment with the Company and supersedes any prior agreements, representations or understandings (whether written, oral or implied) between you and the Company. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other agreements, promises, warranties or representations concerning its subject matter. Changes in your employment terms, other than those changes expressly reserved to the Company's discretion in this letter, require an express written modification signed by both you and a duly authorized officer of the Company. If any provision of this offer letter agreement is determined to be invalid or unenforceable, in whole or in part, this determination shall not affect any other provision of this offer letter agreement and the provision in question shall be modified so as to be rendered enforceable in a manner consistent with the intent of the parties insofar as possible under applicable law. This letter may be delivered and executed via facsimile, electronic mail (including pdf or any electronic signature complying with the U.S. federal ESIGN Act of 2000, Uniform Electronic Transactions Act or other applicable law) or other transmission method and shall be deemed to have been duly and validly delivered and executed and be valid and effective for all purposes.

We hope that you will accept our offer to join the Company. You may indicate your agreement with these terms and accept this offer by signing and dating both the enclosed duplicate original of this letter agreement and the enclosed Confidential Information and Inventions Agreement and returning them to me.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

ARAVIVE INC.

/s/ Rekha Hemrajani

Rekha Hemrajani
President and Chief Executive Officer

I have read and accept this employment offer:

/s/ Gail McIntyre
Signature

Printed Name:
Gail McIntyre

Dated: March 26, 2020

EXHIBIT 1 - EMPLOYEE CONFIDENTIAL INFORMATION AND INVENTIONS ASSIGNMENT AGREEMENT

In consideration of my employment or continued employment by Aravive, Inc. ("Company"), and the compensation paid to me now and during my employment with the Company, I agree to the terms of this Agreement as follows:

1. CONFIDENTIAL INFORMATION PROTECTIONS.

1.1 **Nondisclosure; Recognition of Company's Rights**. At all times during and after my employment, I will hold in confidence and will not disclose, use, lecture upon, or publish any of Company's Confidential Information (defined below), except as may be required in connection with my work for Company, or as expressly authorized by the Chairman of the Board (the "Chairman") of Company. I will obtain the Chairman's written approval before publishing or submitting for publication any material (written, oral, or otherwise) that relates to my work at Company and/or incorporates any Confidential Information. I hereby assign to Company any rights I may have or acquire in any and all Confidential Information and recognize that all Confidential Information shall be the sole and exclusive property of Company and its assigns.

1.2 **Confidential Information**. The term "Confidential Information" shall mean any and all confidential knowledge, data or information related to Company's business or its actual or demonstrably anticipated research or development, including without limitation (a) trade secrets, inventions, ideas, processes, computer source and object code, data, formulae, programs, other works of authorship, know-how, improvements, discoveries, developments, designs, and techniques; (b) information regarding products, services, plans for research and development, marketing and business plans, budgets, financial statements, contracts, prices, suppliers, and customers; (c) information regarding the skills and compensation of Company's employees, contractors, and any other service providers of Company; and (d) the existence of any business discussions, negotiations, or agreements between Company and any third party.

1.3 **Third Party Information**. I understand that Company has received and, in the future, will receive from third parties confidential or proprietary information ("Third Party Information") subject to a duty on Company's part to maintain the confidentiality of such information and to use it only for certain limited purposes. During and after the term of my employment, I will hold Third Party Information in strict confidence and will not disclose to anyone (other than Company personnel who need to know such information in connection with their work for Company) or use, Third Party Information, except in connection with my work for Company or unless expressly authorized by an officer of Company in writing.

1.4 **No Improper Use of Information of Prior Employers and Others**. I represent that my employment by Company does not and will not breach any agreement with any former employer, including any non-compete or non-solicitation agreement or any agreement to keep in confidence or refrain from using information acquired by me prior to my employment by Company. I further represent that I have not entered into, and will not enter into, any agreement, either written or oral, in conflict with my obligations under this Agreement. During my employment by Company, I will not improperly make use of, or disclose, any information or trade secrets of any former employer or other third party, nor will I bring onto the premises of Company or use any unpublished documents or any property belonging to any former employer or other third party, in violation of any lawful agreements with that former employer or third party. I will use in the performance of my duties only information that is generally known and used by persons with training and experience comparable to my own, is common knowledge in the industry or otherwise legally in the public domain, or is otherwise provided or developed by Company.

2. INVENTIONS.

2.1 **Definitions**. As used in this Agreement, the term "Invention" means any ideas, concepts, information, materials, processes, data, programs, know-how, improvements, discoveries, developments, designs, artwork, formulae, other copyrightable works, and techniques and all Intellectual Property Rights in any of the items listed above. The term "Intellectual Property Rights" means all trade secrets, copyrights, trademarks, mask work rights, patents and other intellectual property rights recognized by the laws of any jurisdiction or country. The term "Moral Rights" means all paternity, integrity, disclosure, withdrawal, special and any other similar rights recognized by the laws of any jurisdiction or country.

2.2 **Prior Inventions**. I have disclosed on Exhibit A a complete list of all Inventions that (a) I have, or I have caused to be, alone or jointly with others, conceived, developed, or reduced to practice prior to the commencement of my employment by Company; (b) in which I have an ownership interest or which I have a license to use; (c) and that I wish to have excluded from the scope of this Agreement (collectively referred to as "Prior Inventions"). If no Prior Inventions are listed in Exhibit A, I warrant that there are no Prior Inventions. I agree that I will not incorporate, or permit to be incorporated, Prior Inventions in any Company Inventions (defined below) without Company's prior written consent. If, in the course of my employment with Company, I incorporate a Prior Invention into a Company process, machine or other work, I hereby grant Company a non-exclusive, perpetual, fully-paid and royalty-free, irrevocable and worldwide license, with rights to sublicense through multiple levels of sublicensees, to reproduce, make derivative works of, distribute, publicly perform, and publicly display in any form or medium, whether now known or later developed, make, have made, use, sell, import, offer for sale, and exercise any and all present or future rights in, such Prior Invention.

2.3 **Assignment of Company Inventions**. Inventions assigned to the Company or to a third party as directed by the Company pursuant to the subsection titled Government or Third Party are referred to in this Agreement as "Company Inventions." Subject to the subsection titled Government or Third Party and except for Inventions that I can prove qualify fully under the provisions of California Labor Code section 2870 and I have set forth in Exhibit A, I hereby assign and agree to assign in the future (when any such Inventions or Intellectual Property Rights are first reduced to practice or first fixed in a tangible medium, as applicable) to Company all my right, title, and interest in and to any and all Inventions (and all Intellectual Property Rights with respect thereto) made, conceived, reduced to practice, or learned by me, either alone or with others, during the period of my employment by Company. Any assignment of Inventions (and all Intellectual Property Rights with respect thereto) hereunder includes an assignment of all Moral Rights. To the extent such Moral Rights cannot be assigned to Company and to the extent the following is allowed by the laws in any country where Moral Rights exist, I hereby unconditionally and irrevocably waive the enforcement of such Moral Rights, and all claims and causes of action of any kind against Company or related to Company's customers, with respect to such rights. I further acknowledge and agree that neither my successors-in-interest nor legal heirs retain any Moral Rights in any Inventions (and any Intellectual Property Rights with respect thereto).

2.4 **Obligation to Keep Company Informed**. During the period of my employment and for one (1) year after my employment ends, I will promptly and fully disclose to Company in writing (a) all Inventions authored, conceived, or reduced to practice by me, either alone or with others, including any that might be covered under California Labor Code section 2870, and (b) all patent applications filed by me or in which I am named as an inventor or co-inventor.

2.5 **Government or Third Party**. I agree that, as directed by the Company, I will assign to a third party, including without limitation the United States, all my right, title, and interest in and to any particular Company Invention.

2.6 **Enforcement of Intellectual Property Rights and Assistance**. During and after the period of my employment and at Company's request and expense, I will assist Company in every proper way, including consenting to and joining in any action, to obtain and enforce United States and foreign Intellectual Property Rights and Moral Rights relating to Company Inventions in all countries. If the Company is unable to secure my signature on any document needed in connection with such purposes, I hereby irrevocably designate and appoint Company and its duly authorized officers and agents as my agent and attorney in fact, which appointment is coupled with an interest, to act on my behalf to execute and file any such documents and to do all other lawfully permitted acts to further such purposes with the same legal force and effect as if executed
by me.

2.7 **Incorporation of Software Code**. I agree that I will not incorporate into any Company software or otherwise deliver to Company any software code licensed under the GNU General Public License or Lesser General Public License or any other license that, by its terms, requires or conditions the use or distribution of such code on the disclosure, licensing, or distribution of any source code owned or licensed by Company.

2.8 **Unassigned or Nonassignable Inventions.** I recognize that this Agreement will not be deemed to require assignment of any Invention that is covered under California Labor Code section 2870(a) provided that nothing herein shall forbid or restrict the right of the Company to provide for full title to certain patents and Inventions to be in the United States, as required by contracts between the Company and the United States or any of its agencies.

3. **RECORDS**. I agree to keep and maintain adequate and current records (in the form of notes, sketches, drawings and in any other form that is required by the Company) of all Inventions made by me during the period of my employment by the Company, which records shall be available to, and remain the sole property of, the Company at all times.

4. **ADDITIONAL ACTIVITIES**. I agree that during the term of my employment by Company, I will not (a) without Company's express written consent, engage in any employment or business activity that is competitive with, or would otherwise conflict with my employment by, Company; and (b) for the period of my employment by Company and for one (1) year thereafter, I will not either directly or indirectly, solicit or attempt to solicit any employee, independent contractor, or consultant of Company to terminate his, her or its relationship with Company in order to become an employee, consultant, or independent contractor to or for any other person or entity.

5. **RETURN OF COMPANY PROPERTY**. Upon termination of my employment or upon Company's request at any other time, I will deliver to Company all of Company's property, equipment, and documents, together with all copies thereof, and any other material containing or disclosing any Inventions, Third Party Information or Confidential Information and certify in writing that I have fully complied with the foregoing obligation. I agree that I will not copy, delete, or alter any information contained upon my Company computer or Company equipment before I return it to Company. In addition, if I have used any personal computer, server, or e-mail system to receive, store, review, prepare or transmit any Company information, including but not limited to, Confidential Information, I agree to provide the Company with a computer-useable copy of all such Confidential Information and then permanently delete and expunge such Confidential Information from those systems; and I agree to provide the Company access to my system as reasonably requested to verify that the necessary copying and/or deletion is completed. I further agree that any property situated on Company's premises and owned by Company is subject to inspection by Company's personnel at any time with or without notice. Prior to the termination of my employment or promptly after termination of my employment, I will cooperate with Company in attending an exit interview and certify in writing that I have complied with the requirements of this section.

6. NOTIFICATION OF NEW EMPLOYER. If I leave the employ of Company, I consent to the notification of my new employer of my rights and obligations under this Agreement, by Company providing a copy of this Agreement or otherwise.

7. GENERAL PROVISIONS.

7.1 **Governing Law and Venue**. This Agreement and any action related thereto will be governed and interpreted by and under the laws of the State of California, without giving effect to any conflicts of laws principles that require the application of the law of a different state. I expressly consent to personal jurisdiction and venue in the state and federal courts for the county in which I primarily perform the services for the Company for any lawsuit filed there against me by Company arising from or related to this Agreement.

7.2 **Severability**. If any provision of this Agreement is, for any reason, held to be invalid or unenforceable, the other provisions of this Agreement will remain enforceable and the invalid or unenforceable provision will be deemed modified so that it is valid and enforceable to the maximum extent permitted by law.

7.3 **Survival**. This Agreement shall survive the termination of my employment and the assignment of this Agreement by Company to any successor or other assignee and shall be binding upon my heirs and legal representatives.

7.4 **Employment**. I agree and understand that nothing in this Agreement shall give me any right to continued employment by Company, and it will not interfere in any way with my right or Company's right to terminate my employment at any time, with or without cause and with or without advance notice.

7.5 **Notices**. Each party must deliver all notices or other communications required or permitted under this Agreement in writing to the other party at the address listed on the signature page, by courier, by certified or registered mail (postage prepaid and return receipt requested), or by a nationally- recognized express mail service. Notice will be effective upon receipt or refusal of delivery. If delivered by certified or registered mail, notice will be considered to have been given five (5) business days after it was mailed, as evidenced by the postmark. If delivered by courier or express mail service, notice will be considered to have been given on the delivery date reflected by the courier or express mail service receipt. Each party may change its address for receipt of notice by giving notice of the change to the other party.

7.6 **Injunctive Relief**. I acknowledge that, because my services are personal and unique and because I will have access to the Confidential Information of Company, any breach of this Agreement by me would cause irreparable injury to Company for which monetary damages would not be an adequate remedy and, therefore, will entitle Company to injunctive relief (including specific performance). The rights and remedies provided to each party in this Agreement are cumulative and in addition to any other rights and remedies available to such party at law or in equity.

7.7 **Waiver**. Any waiver or failure to enforce any provision of this Agreement on one occasion will not be deemed a waiver of that provision or any other provision on any other occasion.

7.8 **Export**. I agree not to export, reexport, or transfer, directly or indirectly, any U.S. technical data acquired from Company or any products utilizing such data, in violation of the United States export laws or regulations.

7.9 **Counterparts**. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original and all of which shall be taken together and deemed to be one instrument.

7.10 **Entire Agreement**. This Agreement, together with the Exhibits herein and any executed written offer letter between me and the Company, is the final, complete and exclusive agreement of the parties with respect to the subject matter of this Agreement and supersedes and merges all prior discussions between us; provided, however, prior to the execution of this Agreement, if the Company and I were parties to any agreement regarding the subject matter hereof, that agreement will be superseded by this Agreement prospectively only.

7.11 **Advice of Counsel**. I ACKNOWLEDGE THAT, IN EXECUTING THIS AGREEMENT, I HAVE HAD THE OPPORTUNITY TO SEEK THE ADVICE OF INDEPENDENT LEGAL COUNSEL, AND I HAVE READ AND UNDERSTOOD ALL OF THE TERMS AND PROVISIONS OF THIS AGREEMENT. THIS AGREEMENT WILL NOT BE CONSTRUED AGAINST ANY PARTY BY REASON OF THE DRAFTING OR PREPARATION OF THIS AGREEMENT.

7.12 **Protected Activity Not Prohibited**. I understand that nothing in this Agreement limits or prohibits me from filing a charge or complaint with, or otherwise communicating or cooperating with or participating in any investigation or proceeding that may be conducted by, any federal, state or local government agency or commission, including the Securities and Exchange Commission, the Equal Employment Opportunity Commission, the Occupational Safety and Health Administration, and the National Labor Relations Board ("Government Agencies"), including disclosing documents or other information as permitted by law, without giving notice to, or receiving authorization from, the Company, discussing the terms and conditions of my employment with others to the extent expressly permitted by Section 7 of the National Labor Relations Act. Notwithstanding, in making any such disclosures or communications, I agree to take all reasonable precautions to prevent any unauthorized use or disclosure of any information that may constitute Company Confidential Information to any parties other than the Government Agencies. I further understand that I am not permitted to disclose the Company's attorney-client privileged communications or attorney work product.

This Agreement shall be effective as of the first day of my employment with Company.

EMPLOYEE:	**COMPANY:**
I HAVE READ, UNDERSTAND, AND ACCEPT THIS AGREEMENT AND HAVE BEEN GIVEN THE OPPORTUNITY TO REVIEW IT WITH INDEPENDENT LEGAL COUNSEL.	**ACCEPTED AND AGREED:**
_____	_____
(Signature)	*(Signature)*
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____
Address:	Address:

EXHIBIT A

INVENTIONS

1. Prior Inventions Disclosure. The following is a complete list of all Prior Inventions (as provided in Subsection 2.2 of the attached Employee Confidential Information and Inventions Assignment Agreement, defined herein as the "Agreement"):

☐ None

☐ See immediately below:

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2. Limited Exclusion **Notification.**

THIS IS TO NOTIFY you in accordance with Section 2872 of the California Labor Code that the foregoing Agreement between you and Company does not require you to assign or offer to assign to Company any Invention that you develop entirely on your own time without using Company's equipment, supplies, facilities or trade secret information, except for those Inventions that either:

a. Relate at the time of conception or reduction to practice to Company's business, or actual or demonstrably anticipated research or development; or

b. Result from any work performed by you for Company.

To the extent a provision in the foregoing Agreement purports to require you to assign an Invention otherwise excluded from the preceding paragraph, the provision is against the public policy of this state and is unenforceable.

This limited exclusion does not apply to any patent or Invention covered by a contract between Company and the United States or any of its agencies requiring full title to such patent or Invention to be in the United States.

Exhibit 10.50

ARAVIVE, INC.
RSU AWARD GRANT NOTICE
(2019 EQUITY INCENTIVE PLAN)

Aravive, Inc. (the ***"Company"***) has awarded to you (the "***Participant***") the number of restricted stock units specified and on the terms set forth below in consideration of your services (the ***"RSU Award"***). Your RSU Award is subject to all of the terms and conditions as set forth herein and in the Company's 2019 Equity Incentive Plan (the ***"Plan"***) and the Award Agreement (the "***Agreement***"), which are attached hereto and incorporated herein in their entirety. Capitalized terms not explicitly defined herein but defined in the Plan or the Agreement shall have the meanings set forth in the Plan or the Agreement.

Participant:	_____
Date of Grant:	_____
Vesting Commencement Date:	_____
Number of Restricted Stock Units:	_____

Vesting Schedule: [_____].

Notwithstanding the foregoing, vesting shall terminate upon the Participant's termination of Continuous Service.

Issuance Schedule: One share of Common Stock will be issued for each restricted stock unit which vests at the time set forth in Section 5 of the Agreement.

IMPORTANT INFORMATION REGARDING REJECTION OR ACCEPTANCE OF THE RSU AWARD AND SELL TO COVER ELECTION

Acceptance of the RSU Award: Please read this Grant Notice, the Agreement and the Plan carefully. If you do **not** wish to receive this RSU Award and/or you do **not** consent and agree to the terms and conditions on which this RSU Award is offered, as set forth in the this Grant Notice, the Agreement and the Plan, then you must reject the RSU Award by sending your written notice of rejection to the Plan Administrator at the Company's principal executive offices, located at River Oaks Tower, 3730 Kirby Drive, Suite 1200, Houston, Texas 77098 no later than the 60th calendar day following the Date of Grant (the "***Rejection Deadline***"). However, if the Rejection Deadline does not occur (1) during an "open window period" applicable to you, as determined by the Company in accordance with the Company's then-effective policy or policies on trading in Company securities or (2) on a date when you are otherwise permitted to trade in Company securities, then the Rejection Deadline will be extended until the first business day thereafter on which you are permitted to trade in Company securities in accordance with the Company's then-effective policy or policies on trading in Company securities. If you do not reject the RSU Award in accordance with this paragraph on or prior to the Rejection Deadline (as the same may be extended pursuant to the preceding sentence), then the RSU Award will be deemed to be accepted by you on the Rejection Deadline (as the same may be extended pursuant to the preceding sentence). The date that this RSU Award is deemed accepted by you pursuant to this paragraph is referred to as the "***Acceptance Date***."

If you reject the RSU Award in accordance with the previous paragraph, the RSU Award will be cancelled and your eligibility for any future or additional benefits under the RSU Award will terminate. Similarly, your failure to reject the RSU Award in accordance with previous paragraph on or before the Rejection Deadline (as the same may be extended pursuant to the previous paragraph) will constitute your acceptance of the RSU Award and your agreement with all terms and conditions of the RSU Award, as set forth in the Notice, the Agreement and the Plan, in each case effective on the Acceptance Date.

Sell to Cover Election: By accepting the RSU Award as set forth above, you: (1) elect, on the Acceptance Date, to sell shares of Common Stock issued in respect of the RSU Award in an amount determined in accordance with Section 6(b) of the Agreement, and, on the Acceptance Date, you authorize and direct the Agent (as defined in the Agreement) to remit the cash proceeds of such sale to the Company as more specifically set forth in Section 6(b) of the Agreement (a ***"Sell to Cover"***); (2) direct the Company, on the Acceptance Date, to make a cash payment to satisfy the Withholding Obligation from the cash proceeds of such sale directly to the appropriate taxing authorities; and (3) **represent and warrant that (i) you have carefully reviewed Section 6(b) of the Agreement, (ii) on the Acceptance Date, you are not aware of any material, nonpublic information with respect to the Company or any securities of the Company, are not subject to any legal, regulatory or contractual restriction that would prevent the Agent from conducting sales, do not have, and will not attempt to exercise, authority, influence or control over any sales of Common Stock effected by the Agent pursuant to the Agreement, and are making this election to Sell to Cover on the Acceptance Date in good faith and not as part of a plan or scheme to evade the prohibitions of Rule 10b5-1 (regarding trading of the Company's securities on the basis of material nonpublic information) under the Exchange Act, and (iii) it is your intent that this election to Sell to Cover and Section 6(b) of the Agreement comply with the requirements of Rule 10b5-1(c)(1) under the Exchange Act and be interpreted to comply with the requirements of Rule 10b5-1(c) under the Exchange Act. You further acknowledge that by accepting this RSU Award as set forth above, you are adopting a 10b5-1 Plan (as defined in Section 6(b) of the Agreement) on the Acceptance Date to permit you to conduct a Sell to Cover sufficient to satisfy the Withholding Obligation as more specifically set forth in Section 6(b) of the Agreement.**

Participant Acknowledgements: By failing to notify the Company of your rejection of the RSU Award on or before the Rejection Deadline (as the same may be extended as set forth above), you understand and agree that as of the Acceptance Date:

- The RSU Award is governed by this RSU Award Grant Notice (the "***Grant Notice***"), and the provisions of the Plan and the Agreement (including the provisions of Section 6(b) thereof), all of which are made a part of this document. Unless otherwise provided in the Plan, this Grant Notice and the Agreement (together, the "***RSU Award Agreement***") may not be modified, amended or revised except in a writing signed by you and a duly authorized officer of the Company.

- You have read and are familiar with the provisions of the Plan, the RSU Award Agreement and the Prospectus. In the event of any conflict between the provisions in the RSU Award Agreement, or the Prospectus and the terms of the Plan, the terms of the Plan shall control.

- The RSU Award Agreement sets forth the entire understanding between you and the Company regarding the acquisition of Common Stock and supersedes all prior oral and written agreements, promises and/or representations on that subject with the exception of: (i) other equity awards previously granted to you, (ii) any written employment agreement, offer letter, severance agreement, written severance plan or policy, or other written agreement between the Company and you in each case that specifies the terms that should govern this RSU Award, and (iii) any separate election you enter into with the Company's written approval which is also applicable to the RSU Award.

ARAVIVE, INC.

By: _____
Signature

Title: _____

Date: _____

PARTICIPANT:

_____
Signature

Date: _____

ATTACHMENTS: RSU Award Agreement, 2019 Equity Incentive Plan

ARAVIVE, INC.

2019 EQUITY INCENTIVE PLAN

AWARD AGREEMENT (RSU AWARD)

As reflected by your Restricted Stock Unit Grant Notice ("***Grant Notice***") Aravive, Inc. (the "***Company***") has granted you a RSU Award under its 2019 Equity Incentive Plan (the "***Plan***") for the number of restricted stock units as indicated in your Grant Notice (the "***RSU Award***"). The terms of your RSU Award as specified in this Award Agreement for your RSU Award (the "***Agreement***") and the Grant Notice constitute your "***RSU Award Agreement***". Defined terms not explicitly defined in this Agreement but defined in the Grant Notice or the Plan shall have the same definitions as in the Grant Notice or Plan, as applicable.

The general terms applicable to your RSU Award are as follows:

1. GOVERNING PLAN DOCUMENT. Your RSU Award is subject to all the provisions of the Plan, including but not limited to the provisions in:

(a) Section 6 of the Plan regarding the impact of a Capitalization Adjustment, dissolution, liquidation, or Corporate Transaction on your RSU Award;

(b) Section 9(e) of the Plan regarding the Company's retained rights to terminate your Continuous Service notwithstanding the grant of the RSU Award; and

(c) Section 8(c) of the Plan regarding the tax consequences of your RSU Award.

Your RSU Award is further subject to all interpretations, amendments, rules and regulations, which may from time to time be promulgated and adopted pursuant to the Plan. In the event of any conflict between the RSU Award Agreement and the provisions of the Plan, the provisions of the Plan shall control.

2. GRANT OF THE RSU AWARD. This RSU Award represents your right to be issued on a future date the number of shares of the Company's Common Stock that is equal to the number of restricted stock units indicated in the Grant Notice as modified to reflect any Capitalization Adjustment and subject to your satisfaction of the vesting conditions set forth therein (the "***Restricted Stock Units***"). Any additional Restricted Stock Units that become subject to the RSU Award pursuant to Capitalization Adjustments as set forth in the Plan and the provisions of Section 3 below, if any, shall be subject, in a manner determined by the Board, to the same forfeiture restrictions, restrictions on transferability, and time and manner of delivery as applicable to the other Restricted Stock Units covered by your RSU Award.

3. DIVIDENDS. You may become entitled to receive payments equal to any cash dividends and other distributions paid with respect to a corresponding number of shares of Common Stock to be issued in respect of the Restricted Stock Units covered by your RSU Award. Any such dividends or distributions shall be subject to the same forfeiture restrictions as apply to the Restricted Stock Units and shall be paid at the same time that the corresponding shares are issued in respect of your vested Restricted Stock Units, provided, however that to the extent any such dividends or distributions are paid in shares of Common Stock, then you will automatically be granted a corresponding number of additional Restricted Stock Units subject to the RSU Award (the "***Dividend Units***"), and further provided that such Dividend Units shall be subject to the same forfeiture restrictions and restrictions on transferability, and same timing requirements for issuance of shares, as apply to the Restricted Stock Units subject to the RSU Award with respect to which the Dividend Units relate.

4. WITHHOLDING OBLIGATIONS.

(a) As further provided in Section 8 of the Plan, you hereby authorize withholding from payroll and any other amounts payable to you, and otherwise agree to make adequate provision for, any sums required to satisfy the federal, state, local and foreign tax withholding obligations, if any, which arise in connection with your RSU Award (the "***Withholding Taxes***") in accordance with the withholding procedures established by the Company. Unless the Withholding Taxes are satisfied, the Company shall have no obligation to deliver to you any Common Stock in respect of the RSU Award. In the event the Withholding Obligation of the Company arises prior to the delivery to you of Common Stock or it is determined after the delivery of Common Stock to you that the amount of the Withholding Obligation was greater than the amount withheld by the Company, you agree to indemnify and hold the Company harmless from any failure by the Company to withhold the proper amount.

5. DATE OF ISSUANCE.

(a) If the RSU Award is exempt from application of Section 409A of the Code and any state law of similar effect (collectively ***"Section 409A"***), the Company will deliver to you a number of shares of the Company's Common Stock equal to the number of vested Restricted Stock Units subject to your RSU Award, including any additional Restricted Stock Units received pursuant to Section 3 above that relate to those vested Restricted Stock Units on the applicable vesting date (the ***"Original Issuance Date"***). However, if the Original Issuance Date falls on a date that is not a business day, such delivery date shall instead fall on the next following business day. Notwithstanding the foregoing, if (i) the Original Issuance Date does not occur (1) during an "open window period" applicable to you, as determined by the Company in accordance with the Company's then-effective policy or policies on trading in Company securities or (2) on a date when you are otherwise permitted to sell shares of Common Stock on the open market to satisfy the Withholding Obligation; and (ii) the Company elects, prior to the Original Issuance Date, (x) not to satisfy the Withholding Obligation (as defined in Section 6(a) hereof) by withholding shares of Common Stock from the shares otherwise due, on the Original Issuance Date, to you under this RSU Award pursuant to Section 6 hereof, (y) not to permit you to then effect a Sell to Cover under the 10b5-1 Plan (as defined in Section 6(b) of this Agreement), and (z) not to permit you to satisfy the Withholding Obligation in cash, then such shares shall not be delivered on such Original Issuance Date and shall instead be delivered on the

first business day of the next occurring open window period applicable to you or the next business day when you are not prohibited from selling shares of the Company's Common Stock on the open market, as applicable (and regardless of whether there has been a termination of your Continuous Service before such time), but in no event later than (a) December 31 of the calendar year in which the Original Issuance Date occurs (that is, the last day of the taxable year in which the Original Issuance Date occurs), or (b) if and only if permitted in a manner that complies with Treasury Regulations Section 1.409A-1(b)(4), no later than the date that is the 15th day of the third calendar month of the applicable year following the year in which the shares of Common Stock under this RSU Award are no longer subject to a "substantial risk of forfeiture" within the meaning of Treasury Regulations Section 1.409A-1(d). Delivery of the shares is intended to comply with the requirements for the short-term deferral exemption available under Treasury Regulations Section 1.409A-1(b)(4) and shall be construed and administered in such manner.

(b) To the extent the RSU Award is a Non-Exempt RSU Award, the provisions of Section 11 of the Plan shall apply.

6. WITHHOLDING OBLIGATIONS.

(a) On or before the time you receive a distribution of Common Stock pursuant to your RSU Award, or at any time thereafter as requested by the Company, you hereby authorize any required withholding from the Common Stock issuable to you and/or otherwise agree to make adequate provision in cash for any sums required to satisfy the federal, state, local and foreign tax withholding obligations of the Company or any Affiliate which arise in connection with your RSU Award (the "***Withholding Obligation***").

(b) By accepting this RSU Award as set forth in the Grant Notice, you hereby (i) acknowledge and agree that you have elected a Sell to Cover (as defined in the Grant Notice) on the Acceptance Date to permit you to satisfy the Withholding Obligation and that the Withholding Obligation shall be satisfied pursuant to this Section 6(b) to the fullest extent not otherwise satisfied pursuant to the provisions of Section 6(c) hereof and (ii) further acknowledge and agree to the following provisions, in each case on the Acceptance Date:

(i) You hereby irrevocably appoint E*Trade, or such other registered broker-dealer that is a member of the Financial Industry Regulatory Authority as the Company may select, as your agent (the "***Agent***"), and you authorize and direct the Agent to:

(1) Sell on the open market at the then prevailing market price(s), on your behalf, as soon as practicable on or after the date on which the shares of Common Stock are delivered to you pursuant to Section 5 hereof in connection with the vesting of the Restricted Stock Units, the number (rounded up to the next whole number) of shares of Common Stock sufficient to generate proceeds to cover (A) the satisfaction of the Withholding Obligation arising from the vesting of those Restricted Stock Units and the related issuance of shares of Common Stock to you that is not otherwise satisfied pursuant to Section 6(c) hereof and (B) all applicable fees and commissions due to, or required to be collected by, the Agent with respect thereto;

(2) Remit directly to the Company and/or any Affiliate the proceeds necessary to satisfy the Withholding Obligation;

(3) Retain the amount required to cover all applicable fees and commissions due to, or required to be collected by, the Agent, relating directly to the sale of the shares of Common Stock referred to in clause (1) above; and

(4) Remit any remaining funds to you.

(ii) You acknowledge that your election to Sell to Cover and the corresponding authorization and instruction to the Agent set forth in this Section 6(b) to sell Common Stock to satisfy the Withholding Obligation is intended to comply with the requirements of Rule 10b5-1(c)(1) under the Exchange Act and to be interpreted to comply with the requirements of Rule 10b5-1(c) under the Exchange Act (your election to Sell to Cover and the provisions of this Section 6(b), collectively, the "***10b5-1 Plan***"). You acknowledge that by accepting this RSU Award as set forth in the Grant Notice, you are adopting the 10b5-1 Plan to permit you to satisfy the Withholding Obligation. You hereby authorize the Company and the Agent to cooperate and communicate with one another to determine the number of shares of Common Stock that must be sold pursuant to Section 6(b)(i) to satisfy your obligations hereunder.

(iii) You acknowledge that the Agent is under no obligation to arrange for the sale of Common Stock at any particular price under this 10b5-1 Plan and that the Agent may effect sales as provided in this 10b5-1 Plan in one or more sales and that the average price for executions resulting from bunched orders may be assigned to your account. You further acknowledge that you will be responsible for all brokerage fees and other costs of sale associated with this 10b5-1 Plan, and you agree to indemnify and hold the Company harmless from any losses, costs, damages, or expenses relating to any such sale. In addition, you acknowledge that it may not be possible to sell shares of Common Stock as provided for in this 10b5-1 Plan due to (i) a legal or contractual restriction applicable to you or the Agent, (ii) a market disruption, (iii) a sale effected pursuant to this 10b5-1 Plan that would not comply (or in the reasonable opinion of the Agent's counsel is likely not to comply) with the Securities Act, (iv) the Company's determination that sales may not be effected under this 10b5-1 Plan or (v) rules governing order execution priority on the national exchange where the Common Stock may be traded. In the event of the Agent's inability to sell shares of Common Stock, you will continue to be responsible for the timely payment to the Company of all federal, state, local and foreign taxes that are required by applicable laws and regulations to be withheld, including but not limited to those amounts specified in Section 6(b)(i)(1) above.

(iv) You acknowledge that regardless of any other term or condition of this 10b5-1 Plan, the Agent will not be liable to you for (A) special, indirect, punitive, exemplary, or consequential damages, or incidental losses or damages of any kind, or (B) any failure to perform or for any delay in performance that results from a cause or circumstance that is beyond its reasonable control.

(v) You hereby agree to execute and deliver to the Agent any other agreements or documents as the Agent reasonably deems necessary or appropriate to carry out the purposes and intent of this 10b5-1 Plan. The Agent is a third-party beneficiary of this Section 6(b) and the terms of this 10b5-1 Plan.

(vi) Your election to Sell to Cover and to enter into this 10b5-1 Plan is irrevocable. On the Acceptance Date, you have elected to Sell to Cover and to enter into this 10b5-1 Plan, and you acknowledge that you may not change this election at any time in the future. This 10b5-1 Plan shall terminate not later than the date on which the Withholding Obligation arising from the vesting of your Restricted Stock Units and the related issuance of shares of Common Stock has been satisfied.

(c) Alternatively, or in addition to or in combination with the Sell to Cover provided for under Section 6(b), you authorize the Company, at its discretion, to satisfy the Withholding Obligation by the following means (or by a combination of the following means):

(i) Requiring you to pay to the Company any portion of the Withholding Obligation in cash;

(ii) Withholding from any compensation otherwise payable to you by the Company; and/or

(iii) Withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to you in connection with the RSU Award with a Fair Market Value (measured as of the date shares of Common Stock are issued pursuant to Section 5) equal to the amount of the Withholding Obligation; *provided, however*, that the number of such shares of Common Stock so withheld shall not exceed the amount necessary to satisfy the Company's or Affiliate's tax withholding obligations as permitted while still avoiding classification of the RSU Award as a liability for financial accounting purposes and provided, further, that to the extent necessary to qualify for an exemption from application of Section 16(b) of the Exchange Act, if applicable, such share withholding procedure will be subject to the express prior approval of the Board or the Company's Compensation Committee.

(d) Unless the Withholding Obligation of the Company and/or any Affiliate are satisfied, the Company shall have no obligation to deliver to you any Common Stock.

(e) In the event the Withholding Obligation of the Company arises prior to the delivery to you of Common Stock or it is determined after the delivery of Common Stock to you that the amount of the Withholding Obligation was greater than the amount withheld by the Company, you agree to indemnify and hold the Company harmless from any failure by the Company to withhold the proper amount.

7. Transferability. Except as otherwise provided in the Plan, your RSU Award is not transferable, except by will or by the applicable laws of descent and distribution

8. Corporate Transaction. Your RSU Award is subject to the terms of any agreement governing a Corporate Transaction involving the Company, including, without limitation, a provision for the appointment of a stockholder representative that is authorized to act on your behalf with respect to any escrow, indemnities and any contingent consideration.

9. **No Liability for Taxes**. As a condition to accepting the RSU Award, you hereby (a) agree to not make any claim against the Company, or any of its Officers, Directors, Employees or Affiliates related to tax liabilities arising from the RSU Award or other Company compensation and (b) acknowledge that you were advised to consult with your own personal tax, financial and other legal advisors regarding the tax consequences of the RSU Award and have either done so or knowingly and voluntarily declined to do so.

10. **Severability**. If any part of this Agreement or the Plan is declared by any court or governmental authority to be unlawful or invalid, such unlawfulness or invalidity will not invalidate any portion of this Agreement or the Plan not declared to be unlawful or invalid. Any Section of this Agreement (or part of such a Section) so declared to be unlawful or invalid will, if possible, be construed in a manner which will give effect to the terms of such Section or part of a Section to the fullest extent possible while remaining lawful and valid.

11. **Other Documents.** You hereby acknowledge receipt of or the right to receive a document providing the information required by Rule 428(b)(1) promulgated under the Securities Act, which includes the Prospectus. In addition, you acknowledge receipt of the Company's Trading Policy.

12. **Questions.** If you have questions regarding these or any other terms and conditions applicable to your RSU Award, including a summary of the applicable federal income tax consequences please see the Prospectus.

Exhibit 21.1

SUBSIDIARIES

Aravive Biologics, Inc. (Delaware)

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

Aravive, Inc.
Houston, Texas

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-219765) and Form S-8 (No. 333-227865, No. 333-216586, No. 333-210013, No. 333-204178, No. 333-194949, No. 333-230348, and No. 333-233866) of Aravive, Inc. of our report dated March 27, 2020, relating to the consolidated financial statements, which appears in this Form 10-K.

/s/ BDO USA, LLP

Raleigh, North Carolina
March 27, 2020

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO RULES 13a-14 AND 15d-14 UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Rekha Hemrajani, certify that:

1. I have reviewed this annual report on Form 10-K of Aravive, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 27, 2020

By: /s/ Rekha Hemrajani
Name: Rekha Hemrajani
Title: Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO RULES 13a-14 AND 15d-14 UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Vinay Shah, certify that:

1. I have reviewed this annual report on Form 10-K of Aravive, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 27, 2020

By: /s/ Vinay Shah
Name: Vinay Shah
Title: Chief Financial Officer
(Principal Financial Officer & Principal Accounting Officer)

Exhibit 32.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. §1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, I, Rekha Hemrajani, the Chief Executive Officer of Aravive, Inc. (the "Registrant") hereby certifies, to my knowledge, that:

(1) The accompanying Annual Report on Form 10-K of the Registrant for the year ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Registrant for the periods presented therein

Date: March 27, 2020

By: /s/ Rekha Hemrajani
Name: Rekha Hemrajani
Title: Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. §1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, I, Vinay Shah, the Chief Financial Officer of Aravive, Inc. (the "Registrant") hereby certifies, to my knowledge, that:

(1) The accompanying Annual Report on Form 10-K of the Registrant for the year ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Registrant for the periods presented therein.

Date: March 27, 2020

By: /s/ Vinay Shah
Name: Vinay Shah
Title: Chief Financial Officer
(Principal Financial Officer & Principal Accounting Officer)