pharma plc

4D pharma plc

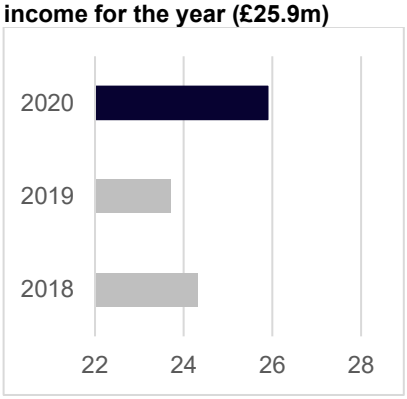
Annual Report and Accounts 2020

Contents

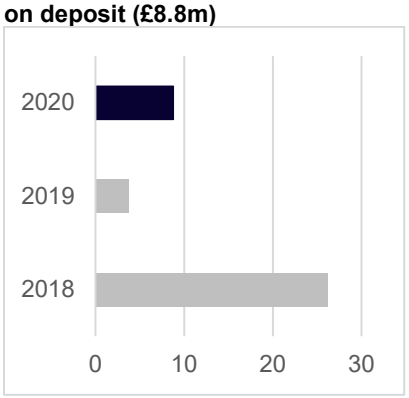
Highlights

Financial highlights

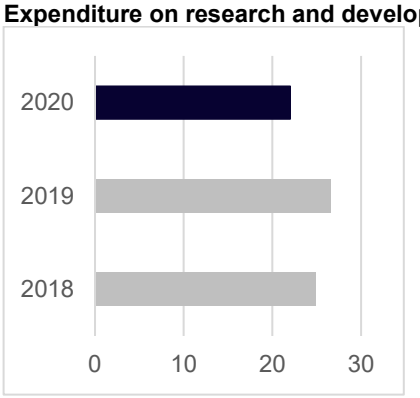
Loss for the year and total comprehensive income for the year (£25.9m)



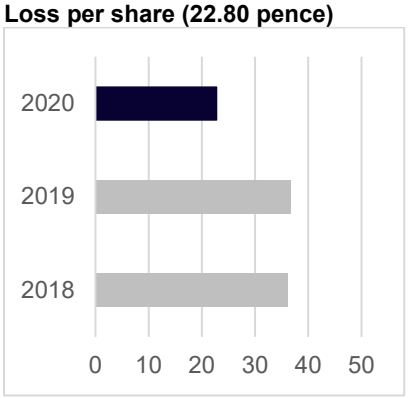
Cash, cash equivalents and cash on deposit (£8.8m)



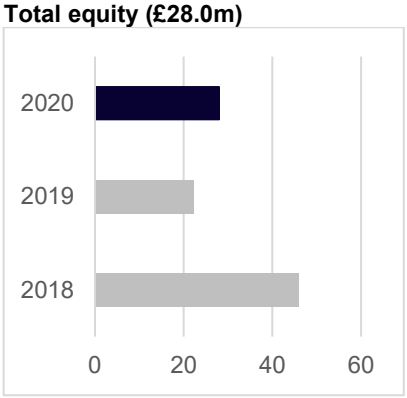
Expenditure on research and development (£22.0m)



Loss per share (22.80 pence)



Total equity (£28.0m)



Highlights continued

Operational highlights

- Announced safety and proof-of-concept clinical efficacy data for lead Live Biotherapeutic MRx0518 in combination with checkpoint inhibitor (ICI) Keytruda® in heavily pre-treated patients with non-small cell lung cancer and renal cell carcinoma refractory to prior ICIs
- Presented the first clinical monotherapy data for a Live Biotherapeutic in oncology with data from Part A of our clinical trial of MRx0518 in the neoadjuvant setting
- Launched a third clinical trial of MRx0518, in pancreatic cancer in combination with stereotactic radiotherapy
- Commencement and expansion of Part B of Phase I/II clinical trial of MRx0518 in combination with Keytruda®, with inclusion of additional tumor type cohorts and additional US sites added
- Phase II data for Blautix® showing clinical activity in irritable bowel syndrome with constipation (IBS-C) or with diarrhoea (IBS-D)
- Launch of a Phase II clinical trial of oral immuno-modulatory Live Biotherapeutic MRx-4DP0004 for the treatment of patients hospitalized with COVID-19
- Completed two fundraises by way of a Placing and Subscription raising gross proceeds for approximately £30 million in gross proceeds
- Entered into a proposed merger agreement with Longevity Acquisition Corporation (Longevity), a NASDAQ-listed Special Purpose Acquisition Company (SPAC), and announced intention to seek NASDAQ listing
- Appointment of Prof. Axel Glasmacher as Non-Executive Chairperson
- Appointment of Dr. Katrin Rupalla as an independent Non-Executive Director
- Appointment of Glenn Dourado as Chief Business Officer

Since the period end

- On 22 March 2021 the Company completed its previously announced merger with Longevity and the listing of its ADSs on NASDAQ also became effective under the ticker ‘LBPS’, the following day 4D’s warrants began trading on NASDAQ under the ticker ‘LBPSW’
- On 22 March 2021, the Company completed a £18.01 million ($25.03) million gross fundraise by way of a private placement of ordinary shares, with Directors intending to subscribe for a further £1.44 million ($2.0 million) following release of the year end results
- On 1 March 2021 we announced the appointment of Paul Maier as an independent Non-Executive Director, and appointment of John Beck as Chief Financial Officer
- On 8 February 2021 we announced our second oncology clinical collaboration and drug supply agreement, with Merck KGaA and Pfizer, Inc. to evaluate MRx0518 in combination with ICI Bavencio® as a first-line maintenance therapy for urothelial carcinoma

Directors, Secretary and Advisors

Directors	Prof. Axel Glasmacher (Non-Executive Chairperson) Duncan Peyton (Chief Executive Officer) Dr. Alexander Stevenson (Chief Scientific Officer) Dr. Ed Baracchini Dr. Sandy Macrae Dr. Katrin Rupalla Paul Maier
Company Secretary	Duncan Peyton
Registered Office	9 Bond Court Fifth Floor Leeds LS1 2JZ
Company Number	08840579
Auditor	**RSM UK Audit LLP** Central Square 5th Floor 29 Wellington Street Leeds LS1 4DL
Nominated Advisor and Broker	**N+1 Singer Advisory LLP** 1 Bartholomew Lane London EC2N 2AX
Joint Broker	**Bryan, Garnier & Co. Limited** Beaufort House 15 St. Botolph Street London EC3A 7BB
Lawyers (English law)	**Pinsent Masons LLP** 30 Crown Place London EC2A 4ES
Lawyers (United States law)	**Wilson Sonsini Goodrich & Rosati** 650 Page Mill Road Palo Alto California 94304
Registrar	**Link Asset Services** The Registry 34 Beckenham Road Beckenham Kent BR3 4TU

Strategic Report: Introduction

The Directors present their Strategic Report together with the Corporate Governance Report, audited consolidated financial statements, audited company financial statements and Auditor's Report for the year ended 31 December 2020.

This strategic report is broken down into the following sections:

- Business Strategy;
- Chairman and CEO's Statement;
- Financial Review; and
- Principal Risks and Uncertainties.

Strategic Report: Business Strategy

4D pharma is a pharmaceutical company developing Live Biotherapeutic Products (LBPs), a novel class of drug derived from the human microbiome. Our differentiated approach focuses on understanding mechanisms of action and the interactions of our LBPs with host biology, and this has generated a pipeline of single strain LBPs targeting major diseases in multiple therapeutic areas with the potential to have significant impacts on unmet patient need. Over recent months, we believe our approach to the development of LBPs has been validated by our observation of signals of clinical activity in our programs in oncology and gastrointestinal disease.

Our strategy

A novel class of therapeutic

Our LBPs are a novel class of biologics based on live organisms, namely single strains of bacteria. These bacteria are not genetically modified and are originally isolated from healthy human donors. Our therapeutic candidates are therefore 'live' drugs that can provide therapeutic benefit via their interaction with host biology, whether by their peptide structural components such as peptides, primary or secondary metabolites or other means. In contrast, biologics, such as antibodies, are not 'live' compounds, and, generally speaking are not naturally occurring molecules. As naturally occurring, non-engineered, commensal bacteria originally isolated from healthy human donors, our LBPs are expected, and to date have been found, to be well tolerated compared with other drugs' modalities such as small molecules or to biologics, given that they are single strains of naturally-evolved human commensal microbes that act on the gut-body network without significant risk of systemic exposure. To date, this has meant that we can accelerate our therapeutic candidates from discovery and pre-clinical testing into clinical trials faster than traditional therapeutic modalities such as small molecules or biologics. For all of our clinical-stage LBP candidates to date, regulators, including the FDA, have allowed us to conduct first-in-human clinical trials in our target patient population without requiring us to first conduct traditional Phase I safety studies in healthy volunteers. These factors reduce the cost and time to generate meaningful in-patient clinical data for our therapeutic candidates compared to small molecules or biologics targeting the same diseases.

Validated discovery platform – MicroRx®

To further advance our product pipeline, we have developed MicroRx®, our LBP discovery platform. MicroRx® interrogates our proprietary library of bacterial isolates for therapeutic functionality and comprehensively characterizes the bacterial isolates using a range of complementary tools and technologies. By developing a thorough understanding of the mechanism of action of our therapeutic candidates and their interaction with host biology, we can develop LBPs that target disease pathology rationally and effectively, and expand our robust sector-leading patent portfolio with additional patents relating to LBP functionality.

Harnessing bacterial functionality in high impact disease areas

The functionality of bacteria and their impact on human biology is diverse, and we have developed a broad pipeline of therapeutic candidates across multiple therapeutic areas. We initially focussed on the gastrointestinal disease space in IBD and IBS, a logical starting point for developing a modality based around organisms found in the human gut. However, as our research expertise and the MicroRx® discovery platform have advanced, we were able to leverage our knowledge of the human microbiome and its diverse interactions with various host systems to realize the potential of LBPs to treat diseases manifest in organs and tissues distal to the gut. Our observation that candidates in our proprietary library were having systemic, not just gut-localized, effects led us to explore new applications and disease areas.

To this end, our key clinical focus areas now include immuno-oncology, central nervous system (CNS) and immunological disorders, with preclinical candidates MRx0029 and MRx0005 targeting Parkinson's disease, MRx0006 targeting neurodevelopment/psychiatric diseases and MRx-4DP0004 targeting COVID-19 and asthma. We have completed three clinical trials and currently have five more ongoing.

Strong position as a leading innovator in Live Biotherapeutics space

With our lead therapeutic candidate, MRx0518, to our knowledge, we delivered the first positive proof-of-concept data with a Live Biotherapeutic in the treatment of cancer. MRx0518 is being evaluated in three ongoing clinical trials, including a Phase I/II trial in solid tumors in combination with immune checkpoint inhibitor Keytruda® in patients with metastatic solid tumors that are refractory to prior anti-PD-1/PD-L1 therapy. We are engaged in business development activities with the goal of expanding the development of MRx0518 into new settings and are actively exploring additional collaboration opportunities.

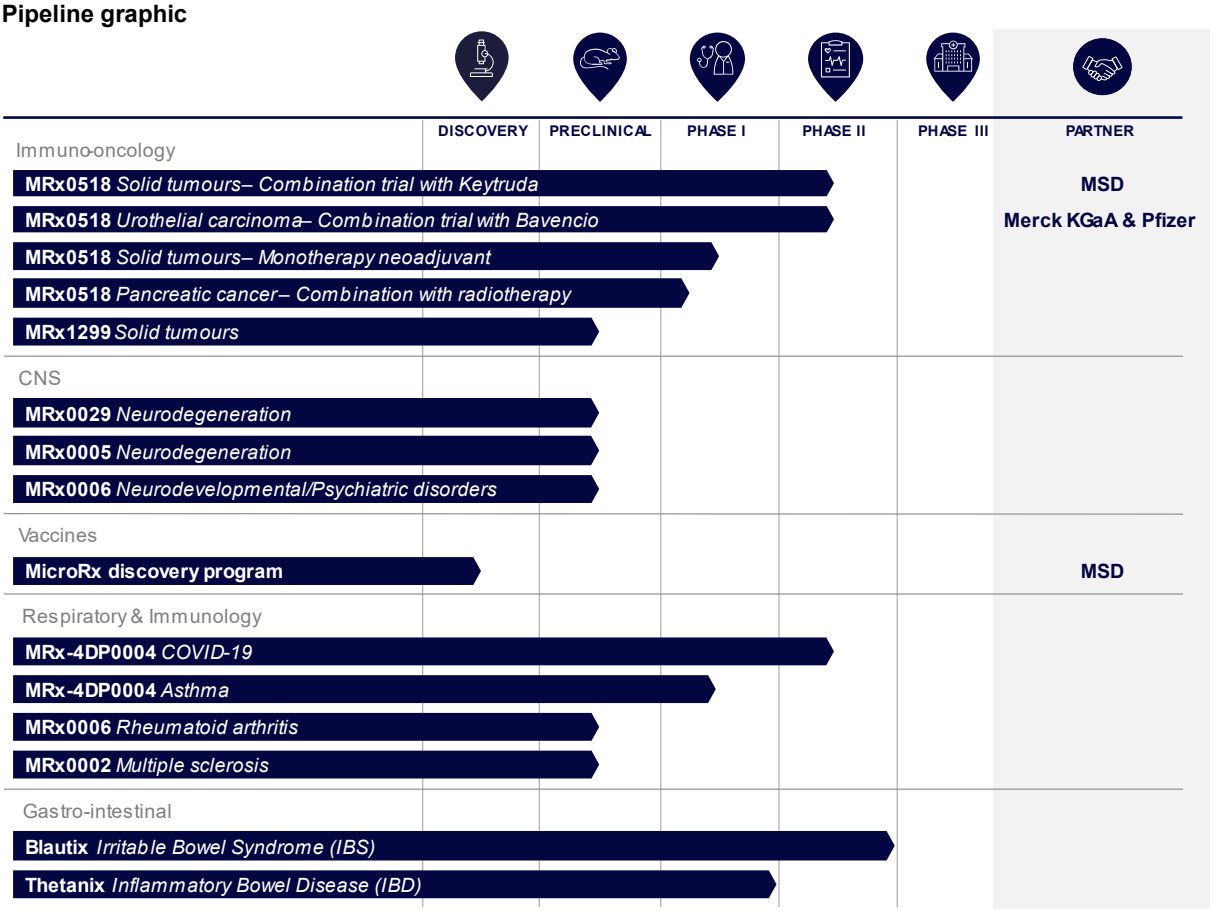
We continue to utilize the MicroRx® platform to discover promising new LBP candidates for major diseases with significant unmet need. As part of our CNS portfolio, we have identified novel LBP candidates that act upon multiple aspects of the pathology of neurodegenerative diseases in preclinical models, including gut-barrier function, neuroinflammation and protection of neurons critical to healthy CNS function. Accordingly, we are currently planning a first-in-human clinical study for our lead CNS therapeutic candidate, MRx0029, in Parkinson's disease patients. As part of our commitment to CNS research and drug development, in December 2020, we became an industry partner of the Parkinson's Progression Markers Initiative, a longitudinal study sponsored by The Michael J. Fox Foundation for Parkinson's Research to better understand Parkinson's disease and accelerate the development of new treatments.

In addition to our internal development programs, we are seeking to realize the value and potential of the MicroRx® platform through collaborations in new areas. In 2019, we entered into a research collaboration and option to license agreement with MSD (the tradename of Merck & Co., Inc., Kenilworth, NJ, USA) to discover and develop LBPs for vaccines. This collaboration pairs our proprietary MicroRx® platform with MSD's expertise in the development and commercialization of novel vaccines, to discover and develop LBPs for use in vaccines in up to three undisclosed indications.

Our development pipeline

4D's MicroRx® platform has generated a strong pipeline with 4 internally-derived clinical-stage candidates. In 2020 we delivered key clinical readouts from multiple studies from two of those candidates, while continuing to launch new clinical trials. Our clinical candidates are followed by a suite of pre-clinical candidates in the areas of Immuno-oncology, CNS, and immunological disorders, as well as our research collaboration with MSD in the vaccines field.

Pipeline graphic



Our goal is to pioneer a novel class of safe and effective therapeutic derived from the gut microbiome that has the potential to transform the way many diseases are treated.

Key elements of our strategy include:

Continuing to be a leading innovator in the microbiome field, with a rigorous approach that focuses highly on the functionality of our LBPs.

We continue to make significant investments in our research, manufacturing and clinical capability to put ourselves at the front of the pack in the microbiome space. This expertise has generated what we believe is a comprehensive intellectual property portfolio in the microbiome space.

Delivering what we believe are differentiated LBPs in multiple indications.

We intend to deliver what we believe are differentiated therapeutics that leverage the inherent advantages of LBPs in multiple indications. We strive to deliver positive clinical data, particularly in our immuno-oncology program, with a goal to develop the first LBP approved for the treatment of cancer. We continue to work to push LBPs into new therapeutic areas, such as our preclinical LBP therapeutic candidates MRx0029 and MRx0005 that leverage the gut-brain axis and are currently being developed for Parkinson's disease.

Working with partners to realize the full potential of our sector-leading capabilities.

MicroRx® is a unique LBP discovery and development platform and, alongside building our internal pipeline of LBP candidates, the platform also enables us to build valuable partnerships and collaborations. We believe the collaboration with MSD to discover and develop LBPs for vaccines, in addition to the proof-of-concept data generated to date across multiple programs, has validated the MicroRx® platform and 4D pharma's approach to LBP development. We will seek to engage additional new partners that wish to explore the potential of LBPs in disease areas of interest through collaborations.

Strategic Report: Chairman & CEO's statement

Introduction

4D pharma's strategy continues to be to pioneer a novel class of safe and effective therapeutic derived from the gut microbiome – Live Biotherapeutic Products – and to selectively partner or potentially develop these through regulatory approval and subsequent commercialization.

During the year, we made significant progress across our LBP clinical development programs. In April we announced the successful completion of the Part A safety phase of our Phase I/II clinical trial of lead immuno-oncology LBP candidate MRx0518 in combination with immune checkpoint inhibitor (ICI) Keytruda® (pembrolizumab) in patients with solid tumors refractory to prior ICI therapy. During Part A of this clinical trial, MRx0518 showed no treatment-related serious adverse effects or drug discontinuations and, importantly, no increase of immune-related adverse events that are often associated with ICI therapy. The safety review committee duly recommended to proceed to Part B of the study, which is ongoing.

In August, we announced comprehensive clinical benefit data from the 12 patients enrolled into Part A of the trial. Five patients (42%) demonstrated clinical benefit (defined as a complete response, partial response or stable disease for six months or longer) on treatment with MRx0518 and Keytruda®, including three patients achieving partial responses, an objective response rate of 25%. To the best of our knowledge, we have delivered the first ever proof-of-concept data in the treatment of cancer using LBPs.

At the Society for Immunotherapy of Cancer (SITC) Annual Meeting 2020 in November we announced the expansion of the Part B of this study, with the inclusion of three additional tumor type cohorts of triple-negative breast cancer, squamous cell carcinoma of the head and neck, and microsatellite instability high/mismatch repair deficient solid tumors, in addition to the previously enrolling cohorts of renal cell carcinoma, non-small cell lung cancer and bladder cancer.

In October 2020 we completed a Phase II clinical trial investigating the efficacy of Blautix® in the treatment of irritable bowel syndrome (IBS) which showed: (i) a statistically significant increase in overall response in pre-planned analysis of the combined IBS-C/D group compared to placebo; and (ii) a positive, though non-significant increase in overall response in both IBS-C and IBS-D cohorts, individually. The primary efficacy endpoint of the trial was based on whether or not a subject, from either the IBS-C or IBS-D cohorts, was considered an overall responder. For a subject to be classed as an 'overall responder' they must have reported an improvement in their weekly (cohort specific) symptoms (abdominal pain intensity and stool frequency or consistency) for ≥50% of the treatment period.

In April 2020 we received MHRA acceptance for a UK Phase II clinical trial of our immuno-modulatory LBP MRx-4DP0004 in patients hospitalized with COVID-19. MRx-4DP0004 is in an ongoing Phase I/II clinical trial in asthma patients as an add-on therapy to existing long-term maintenance therapy.

In support of our efforts to advance LBP candidates into the clinic for the treatment of neurodegenerative diseases such as Parkinson's disease, in December 2020 we became an industry partner of the Parkinson's Progression Markers Initiative (PPMI), a longitudinal study sponsored by The Michael J. Fox Foundation for Parkinson's Research to better understand Parkinson's disease and accelerate the development of new treatments. 4D pharma representatives will join the Partner Scientific Advisory Board closely involved in the design and execution of the study, as well as a variety of PPMI Working Groups.

In the year we made good progress in our research collaboration with Merck Sharp & Dohme to discover and develop vaccines in up to three indications. To date, we have screened and characterized hundreds of LBPs with immuno-modulatory potential and selected from this group lead LBPs with desirable immuno-modulatory properties for further evaluation and development.

In addition to continued progress in advancing multiple development programs and therapeutic candidates, in October 2020 the Company entered a definitive merger agreement with Longevity Acquisition Corporation (NASDAQ: LOAC) a publicly-traded special purpose acquisition company (SPAC) and announced our intention to seek a NASDAQ listing of 4D pharma American Depositary Shares (ADSs). After the period end, on 22 March 2021, the merger was completed and the listing of 4D pharma ADSs on NASDAQ became effective under the ticker symbol 'LBPS', the associated warrants began trading on NASDAQ on the 23 March 2021 under the ticker 'LBPSW'.

Update on the impact of COVID-19

In 2020, the global COVID-19 pandemic affected almost all aspects of the global economy and the pharmaceutical industry, the Group included. In response to this unexpected and unprecedented event, the Group took the situation very seriously and heeded the advice of the UK, Spanish, Irish and US governments and other authorities, utilizing technology effectively to mitigate this unprecedented disruption where possible. To protect the safety of patients, the Group's staff and the staff of the Company's collaborators, the Group limited non-essential activity at clinical sites which in turn has had an impact on patient recruitment for some studies resulting in some potential delays to expected clinical readouts.

The likely duration of the disruption caused by COVID-19 still remains uncertain, making it difficult to accurately predict the impact on the Group's operations and clinical timelines. However, in light of this unprecedented situation the Board of Directors carefully re-evaluated the Group's strategic priorities and near-to-mid-term objectives and took measures to streamline the business and to prioritize allocation of capital and resources to key programs set to deliver key clinical value drivers for our shareholders.

The Group remains committed to reviewing the rapidly evolving global situation and adapting its strategy and operations accordingly.

Organizational changes, Board and governance

In 2020 4D pharma welcomed decades of biopharma experience to our Board and leadership team, providing invaluable expertise to help guide the Company's ongoing growth and development.

In April, Prof. Axel Glasmacher was appointed Chairperson from his previous role as Non-Executive Director. We expect Prof. Glasmacher to be able to contribute his experience as an oncology physician, Senior Vice President Global Clinical R&D at Celgene and Board member of the Cancer Drug Development Forum, to guide the clinical strategy of 4D's LBPs including, but not limited to, lead oncology candidate MRx0518.

In August the Board was pleased to welcome Dr. Katrin Rupalla, Dr Rupalla's appointment as a Non-Executive Director was then ratified in September. Dr. Rupalla is currently Senior Vice President Regulatory Affairs, Medical Documentation and R&D Quality at Lundbeck A/S (CPH: LUN), a CNS specialist biotech, and before this spent several years in senior roles overseeing the global development of blockbuster oncology products at Merck & Co., Roche, Celgene and Bristol-Myers Squibb (BMS).

In addition to expanding our Board of Directors, we have also made important additions to our Executive management team. In April we welcomed Glenn Dourado as our new Chief Business Officer, bringing a wealth of expertise in biopharma business development and strategy, with extensive experience particularly with NASDAQ-listed biotech's and in the field of oncology, expanding both our Business Development activities and also our US footprint.

After the period end, in March 2021, we further expanded our Board and management team, appointing John Beck as Chief Financial Officer and Paul Maier as Non-Executive Director; Mr Maier was also appointed Chair of 4D's Audit and Risk Committee and will serve as the Company's 'audit committee financial expert' under QCA, SEC and NASDAQ rules. Mr. Beck brings over 30 years of experience in financial and biopharmaceutical industry management experience. This includes three previous positions as Chief Financial Officer of publicly traded life sciences companies where he has achieved notable results in areas including finance, business and corporate development, strategy, and commercialisation.

Mr. Maier has over 25 years of investor and public relations, operational, regulatory, and finance expertise in the healthcare industry. Mr. Maier was previously the Chief Financial Officer of Sequenom Inc., where he was responsible for raising over $360 million in equity and debt financings, expanding institutional sell side research analyst coverage, as well as overseeing and establishing and overseeing -internal financial infrastructure. Previously, he was Senior Vice President and Chief Financial Officer of Ligand Pharmaceuticals (NASDAQ: LGND). He has also acted as an independent financial consultant to life sciences companies. Mr. Maier is currently a Board member of Eton Pharmaceuticals, Inc, Biological Dynamics and International Stem Cell Corporation (OTCQB: ISCO).

The Board is committed to maintaining high standards of governance, both at Board level and operationally throughout the business. The Group's Corporate Governance Report can be found on pages 23 to 25.

Section 172 Companies Act 2006

Under section 172 of the Companies Act 2006, the Directors consider that they have acted in a way they consider, in good faith, would promote the sustainable success of the Group, having regard for the stakeholders and matters set out in section 172, in the decisions taken during the year ended 31 December 2020.

As set out within the content of this Annual Report, the Directors have considered the following matters throughout the year and in formulating the future strategy of the business:

- The likely long-term consequences of any decision, as set out within our Business Strategy and Chairman and CEO's Statement on pages 5 to 8;
- The interests of the Group's employees as set out within our Business Overview on page 12;
- The need to foster and maintain business relationships with collaborators, suppliers and others on page 24;
- The impact of the Group's operations on the community and the environment, as set out within our summary of environmental matters on pages 31 to 32;
- The desirability of the Group maintaining a reputation for high standards of business conduct on pages 23 to 29; and
- The need to act fairly and in the best interests of shareholders of the Group, as set out within our Corporate Governance Report on page 23 to 29.

The Board maintains a healthy dialogue with all of its stakeholders and values regular communications with its various stakeholder groups, and aims to ensure that all communications concerning the Group's activities are timely, clear, fair and accurate.

Directors seek to speak with institutional shareholders at least twice a year and the Board's engagement with shareholders has influenced our capital structure. The Group also takes into consideration shareholder views and interests in its decision making. We have increased its engagement with private investors through a number of channels, and endeavor to respond to all reasonable queries from investors to the best of our ability and within the limits of confidential or inside information.

We have enhanced internal communication channels to better recognize and celebrate the achievements of our employees, while also providing additional opportunities for our employees to voice thoughts directly to senior management. The Company supports our employees' ongoing professional development through qualifications and other skills development.

As we progress drug candidates into and through the clinic, the Group has increased its engagement with patient advocacy groups and disease-focused charitable foundations to ensure our work is aligned with the interests and needs of real-world patients. Similarly, engagement with regulators and Key Opinion Leaders (KOLs) to discuss our clinical plans and results, is central to informing our development strategy. We have hosted multiple publicly available discussions with KOLs, to better disseminate these conversations to wider audiences including but not limited to our investors, the general public and media.

The Board engages with our partners, regularly and at key milestones or decision points – primarily through video conferences and email due to geographic distribution and COVID-19-related restrictions on travel meetings of large groups of people – to review progress, maximize effectiveness and ensure equitable satisfaction of the collaborations' objectives.

Oncology

Our lead product candidate in our immuno-oncology program is MRx0518. This candidate is now being assessed in three separate clinical trials, and to the best of our knowledge has delivered the first proof-of-concept data of a Live Biotherapeutic in a cancer setting.

MRx0518 is currently being assessed in the following clinical trials:

- in combination with Keytruda® in patients with solid tumors that are resistant to prior ICIs, in collaboration with MSD;
- as a monotherapy treatment in the neoadjuvant setting in patients undergoing surgical resection of solid tumors; and
- in combination with hypofractionated radiotherapy in the neoadjuvant setting in patients with potentially resectable pancreatic cancer.

Phase I/II clinical trial: MRx0518 in combination with Keytruda®

MRx0518 is being evaluated in an ongoing Phase I/II clinical trial in solid tumors in combination with ICI Keytruda® in patients with metastatic solid tumors that are refractory to prior anti-PD-1/PD-L1 ICI therapy. This trial is a clinical collaboration with MSD. All patients enrolled in this clinical trial had previously responded to ICIs, and then developed resistance and progressive disease. The clinical trial evaluates whether the combination of MRx0518 and Keytruda® can affect a response in patients with resistance to ICIs, thus turning non-responders into responders.

The trial is formed of two parts. Part A was an initial safety phase in 12 patients, evaluating the safety and tolerability of the combination with MRx0518 and Keytruda®. Patients enrolled in Part A are eligible to remain on study treatment for up to two years to evaluate clinical benefit. In May 2020 we announced the successful completion of Part A and the recommendation of the safety review committee to proceed to Part B of the study.

Then, in August, we announced comprehensive clinical benefit data from the 12 patients enrolled into Part A of the trial. Five patients (42%) demonstrated clinical benefit (defined as a complete response, partial response or stable disease for six months or longer) on treatment with MRx0518 and Keytruda®, include three patients achieving partial responses, an objective response rate of 25%. To the best of our knowledge, we delivered the first ever proof-of-concept data in the treatment of cancer using LBPs. We and our collaborator MSD pre-defined a clinical benefit threshold in this trial to support further investigation of ≥10%, which was substantially exceeded in the Part A cohort.

During Part A of this clinical trial, MRx0518 showed no treatment-related serious adverse effects or drug discontinuations and, importantly, no increase of immune-related adverse events that are often associated with ICI therapy.

Following successful completion of Part A, Part B is ongoing and will enroll up to 120 patients to evaluate clinical benefit in addition to safety and tolerability, namely 30 patients per tumor type cohort of metastatic non-small cell lung cancer (NSCLC), renal cell carcinoma (RCC) and bladder cancer that are refractory to prior anti-PD-1/PD-L1 therapy, and additional cohorts of 10 patients with new tumor types triple-negative breast cancer (TNBC), squamous cell carcinoma of the head and neck (HNSCC) and microsatellite instability-high or mismatch repair deficient (MSI-H/dMMR) tumors that are also refractory to prior anti-PD-1/PD-L1 therapy are to be enrolled in the study.

In February 2021, we reported that target tumor reductions in Part B patients have been observed as patients reach the first scheduled restaging timepoint (nine weeks). These include the first signals of anti-tumor activity for the combination in bladder cancer, adding to the previously reported activity in RCC and NSCLC in patients in Part A. Enrolment for the trial is expected to complete in Q4 2021.

Phase I clinical trial: MRx0518 as a neoadjuvant monotherapy

We also have an ongoing Phase I clinical trial of MRx0518 as a neoadjuvant monotherapy in patients undergoing surgical resection of solid tumors, which is being conducted at Imperial College London. MRx0518 is dosed as a monotherapy for two to four weeks prior to resection. Changes in systemic immune and intratumoral biomarkers are analyzed to assess the effect of MRx0518 monotherapy on immune cell populations over the dosing period. Results of this trial are expected to develop our understanding of the mechanism of action of MRx0518 in the clinical setting which could inform the clinical development strategy for this candidate.

Initial results from Part A of this trial were presented at SITC 2020 in November 2020. For the 17 patients enrolled in Part A of this clinical trial, following MRx0518 treatment, relative increases in cytotoxic cells, CD8+ T cells and other immune subsets associated with anti-tumor activity were observed in paired tumor samples. Upregulation of key immuno-stimulatory anti-tumor cytokines and chemokines, such as IL-12 and CXCL10, was also observed in post-treatment plasma samples. Gene expression analysis identified significant expression changes in 98 genes ($p<0.05$) in paired samples as a result of MRx0518 treatment, including upregulation of pathways associated with antigen presentation, costimulatory signaling, cytokine and chemokine signaling, known to promote anti-tumor immune activity. Crucially, the changes in intratumor immune subsets observed echoed findings in the preclinical setting with MRx0518. We are currently designing Part B of this Phase I clinical trial.

Additional biomarker analyses are underway to further investigate the immune response induced by MRx0518. These additional results may inform an optimization of Part B of this study.

Phase I clinical trial: MRx0518 as a neoadjuvant monotherapy in combination with hypofractionated radiotherapy

A third clinical trial of MRx0518 is ongoing in potentially resectable pancreatic cancer, as part of our strategic collaboration with the University of Texas MD Anderson Cancer Center. Our open-label, Phase I clinical trial will treat 15 potentially resectable pancreatic ductal adenocarcinoma (PDAC) patients for approximately six to nine weeks, before, during and after a course of hypofractionated radiation until resection. The clinical trial is evaluating the safety of MRx0518 with radiation and whether MRx0518 can elicit an immunogenic profile that may be beneficial in decreasing systemic failure and improving local control. Efficacy outcomes will include incidence of major pathologic response, tumor infiltrating lymphocytes, overall survival, progression-free survival, local control, distant control and margin status. The study will evaluate immune infiltrates and stromal cells within and near the tumor as well as evaluating circulating immune cells, tumor cells and tumor DNA. We anticipate receiving initial data from this Phase I clinical trial in 2021. Study treatment has been well tolerated to date.

Oncology continued

Exploring new settings and combinations

Having been highly encouraged by signals of clinical activity observed so far with MRx0518 combined with no observed treatment-related serious adverse effects or drug discontinuations, including in particularly difficult-to-treat refractory patients, we are actively exploring additional drug combinations and settings in which to evaluate MRx0518. We are also active in seeking collaborations with industrial partners operating in the pharmaceutical industry to expand the MRx0518 clinical development program.

The Keytruda® combination clinical trial and pancreatic cancer clinical trial are part of our strategic collaboration with the University of Texas MD Anderson Cancer Center to evaluate 4D's Live Biotherapeutic oncology pipeline across a range of cancer settings. The collaboration brings together MD Anderson's translational medicine and clinical research capabilities with our expertise in the discovery and development of LBPs.

In February 2021, the Company announced a clinical trial collaboration and supply agreement with Merck KGaA, Darmstadt, Germany and Pfizer Inc. for Bavencio® (avelumab), the first and only immunotherapy approved as a first-line maintenance treatment for patients with locally advanced or metastatic urothelial carcinoma. Under the collaboration, 4D pharma intends to commence a clinical trial in 2021 to evaluate Bavencio® in combination with MRx0518 as a first-line maintenance therapy for patients with locally advanced or metastatic urothelial carcinoma that has not progressed with first-line platinum-containing chemotherapy.

In addition to lead oncology candidate MRx0518, we have second generation oncology candidates in preclinical development, such as MRx1299, which have differentiated mechanisms of action to MRx0518 that may be more suitable for the treatment of additional tumor types.

CNS Portfolio

4D pharma has recently focused its MicroRx® platform on the gut-brain axis. This work has identified two LBP candidates that demonstrate significant effects on many of the key aspects of Parkinson's disease pathology and represent potentially disease-modifying therapies, in addition to candidates that have effects on the behavior of animals in preclinical models that demonstrate potential in autism and psychiatric conditions.

Neurodegenerative disease

Using MicroRx®, a multi-targeted functional screening approach was employed that led to the selection of two strains of bacteria, MRx0005 and MRx0029 which have demonstrated in vitro and in vivo impacts on key aspects of neurodegenerative diseases like Parkinson's disease such as decreasing neuroinflammatory responses, protecting against oxidative stress, upregulation of gene expression of proteins associated with gut barrier integrity. MRx0029 has shown promise as a potentially disease-modifying therapy, by indicating a potentially neuro-regenerative effect that could counteract the characteristic loss of dopaminergic neurons in PD by inducing neuronal differentiation of neuronal progenitor cells towards a dopaminergic phenotype.

In an animal model of PD, MRx0029 reduced loss of dopaminergic neurons, and MRx0005 was able to reduce deficits in dopamine and striatal 3,4-Dihydroxyphenylacetic acid (DOPAC), a metabolite of dopamine.

We are in the process of evaluating designs for a potential first-in-human clinical trial of lead LBPs in patients with PD and have enlisted the help of key opinion leaders in PD clinical study design to assist in planning.

Parkinson's Progression Markers Initiative

In December 2020, we became an industry partner of the Parkinson's Progression Markers Initiative (PPMI), a longitudinal study sponsored by The Michael J. Fox Foundation for Parkinson's Research to better understand Parkinson's disease and accelerate the development of new treatments. We will contribute to the efforts of the PPMI as members of the Partner Scientific Advisory Board closely involved in the design and execution of the study. In addition, we also joined a variety of PPMI Working Groups that provide a forum to discuss PPMI data and address Parkinson's clinical trial challenges with other PPMI industry and non-profit partners.

Neurodevelopmental

In 2020, at the Microbiome Connect: Human USA conference, we presented for the first time preclinical data for our Live Biotherapeutic candidates for the treatment of autism spectrum disorder at a scientific meeting. Our MicroRx® platform has identified preclinical candidate MRx0006, that shows strong potential for the treatment of neurodevelopmental disorders. In genetic and environmental animal models of autism, MRx0006 demonstrated statistically significant effects in a range of tests that assess autism-like behaviors. The results in these models indicated reduced stereotyped behaviors, increased social interaction, reduced anhedonia, decreased depressive-like behavior, and decreased anxiety-like behaviors. MRx0006 also demonstrated the ability to significantly increase expression of these neuropeptides, indicating potential to improve autistic-like behaviors.

Gastrointestinal disease

In October 2020 we completed a Phase II clinical trial investigating the efficacy of Blautix® in the treatment of irritable bowel syndrome (IBS) which showed: (i) a statistically significant increase in overall response in pre-planned analysis of the combined IBS-C/D group compared to placebo; and (ii) a positive, though non-significant increase in overall response in both IBS-C and IBS-D cohorts, individually. The primary efficacy endpoint of the trial was based on whether or not a subject, from either the IBS-C or IBS-D cohorts, was considered an overall responder. For a subject to be classed as an 'overall responder' they must have reported an improvement in their weekly (cohort specific) symptoms (abdominal pain intensity and stool frequency or consistency) for ≥50% of the treatment period.

The trial was intended as a signal finding Phase II study, to generate a signal of activity in both IBS-C and IBS-D and generate the clinical data to inform the design of a Phase III pivotal program towards registration. We believe the Phase II results provide a strong foundation for the continued development of Blautix as the first therapeutic with the potential to treat both major subtypes of IBS. The Phase II data will also form the basis of regulatory engagement around the design of a potential Phase III pivotal trial.

Respiratory disease

MicroRx® enabled the discovery of MRx-4DP0004, a Live Biotherapeutic candidate with unique effects on inflammation, particularly in the lungs. MRx-4DP0004 demonstrates an ability to address both neutrophilic and eosinophilic lung inflammation concurrently, something not possible with existing approved asthma therapies. The candidate is currently being evaluated in two clinical trials, a Phase I/II study in patients with uncontrolled asthma, and a Phase II study in patients with COVID-19.

Respiratory disease continued

Phase I/II clinical trial in asthma

MRx-4DP0004 is in an ongoing Phase I/II first-in-human clinical trial in patients with partly controlled asthma, as an add-on therapy to their long-term maintenance asthma medication. The trial assesses the safety and tolerability of MRx-4DP0004, in addition to clinical endpoints relating to exacerbations, lung function and quality of life, and a wide panel of host and microbiome biomarkers that will contribute to mechanistic understanding of the candidate.

To the best of our knowledge, this is the world's first clinical trial of a single strain Live Biotherapeutic in this indication. COVID-19 has had an impact on enrollment for the trial in 2020, and we now expect preliminary data in Q3 2021.

Phase II clinical trial in patients hospitalized with COVID-19

We are utilizing the unique immunomodulatory profile of MRx-4DP0004 as a therapeutic to prevent or reduce the hyperinflammatory response in patients hospitalized with COVID-19. Based on peer-reviewed data regarding the immune response to the novel coronavirus SARS-CoV-2, we were able to recognize the potential of MRx-4DP0004 to impact multiple components of the immune system implicated in the worsening of disease as a result of the body's hyperinflammatory response.

In April 2020 we received MHRA acceptance for a UK Phase II clinical trial of LBP MRx-4DP0004 in patients hospitalized with COVID-19. We expect preliminary data from the study in Q2 2021.

SPAC merger and US listing

In recent years there has been a significant increase in interest in 4D from overseas investors, particularly those based in the US. Seeking to capitalize on this increased interest, a strategic priority was to investigate options to increase access to US capital, including exploring routes to a US listing. We strongly believe that a US listing will give 4D an opportunity to expand its investor base, attract additional capital investment and enhance our reputation on the global stage. A US listing enables us to access funds from specialist US healthcare investors that might otherwise be unavailable to us through our existing listing in the UK on AIM. NASDAQ is well known as a particularly supportive environment for rapidly growing and innovative biotech businesses such as 4D. We are confident that the large pool of specialist healthcare investors in the US has an investment appetite more suited to a rapidly growing company in the biotechnology sector. As such, we expect the value of the Company's intellectual property, MicroRx® platform and drug discovery and development activities will be better realized on NASDAQ, enabling us to continue to establish 4D's position as a global leader in its field and maximize shareholder value.

After thoroughly exploring a number of options, including a direct listing onto a US exchange and a reverse merger, we concluded that the preferred avenue to accessing the US capital markets was a merger with a special purpose acquisition company, or SPAC, a strategy which has become increasingly popular in 2020. After a comprehensive analysis of available SPACs we identified Longevity, a NASDAQ-listed SPAC with sufficient capital to extend our cash runway without excessively diluting the existing shareholders.

In October, we announced the proposed merger with Longevity and our intention to seek to launch a new NASDAQ American Depositary Share (ADS) program. As a result of the combination will benefit from the $14.8 million in gross cash held by Longevity ($11.6 million net). In addition, 4D pharma could also benefit from the proceeds of Longevity warrants which have now been converted to purchase shares in the Company. Details of the final transaction are included in note 28.

The merger with Longevity was approved by the Company shareholders on 18 March and became effective on 22 March 2021, and the listing of the Company ADSs on NASDAQ became effective on 22 March 2021 under the ticker 'LBPS' and the related warrants began trading under the ticker 'LBPSW' the following day.

Also in March 2021, The Company completed a private placement of new ordinary shares with US institutional investors, accredited investors and Merck Sharpe and Dohme Corp raising approximately £18.01 million ($25.03 million) in gross proceeds (approximately £16.9 million net of fees) with a further £1.44 million ($2.0 million) intended as subscriptions from Duncan Peyton (CEO) and Alex Stevenson (CSO) once the Company has released these financial statements.

Future outlook

Having completed our merger with Longevity, obtained a NASDAQ listing, and completed the placing, we look ahead to the year with great excitement and ambition.

Over the next year we expect a number of important readouts across our clinical pipeline. These include the first data from our third study of MRx0518, in pancreatic cancer, as well as additional data from the ongoing Part B of our combination study of MRx0518 with Keytruda®. We also expect to announce initial data from two trials of MRx-4DP0004, in asthma and COVID-19.

Meanwhile, we continue to expand our clinical activities. Following the announcement of our clinical collaboration with Merck KGaA and Pfizer in February 2021, we expect to commence a clinical trial of MRx0518 in combination with immune checkpoint inhibitor Bavencio® in 2021. This trial will further expand the range of settings in which MRx0518 is being studied in the clinic, this time as a first-line maintenance therapy.

We are also progressing plans to advance Live Biotherapeutic candidates into the clinic for the treatment of diseases of the CNS such as Parkinson's disease. In late 2020 and early 2021 we announced a series of collaborations with top-tier non-profit partners in support of this goal, which will provide valuable input as we advance towards the clinic.

While we are pleased with the progress we are making in the clinic, we continue to leverage the MicroRx® platform to generate value, through our internal development pipeline but also by facilitating partnerships. In 2019, we entered into a research collaboration and option to license agreement with MSD to discover and develop LBPs for vaccines. This collaboration pairs our proprietary MicroRx® platform with MSD's expertise in the development and commercialization of novel vaccines, to discover and develop LBPs as vaccines in up to three undisclosed indications. This research collaboration serves as an example of the power and potential of our MicroRx® platform and provides a valuable endorsement from an industry leading partner.

We believe the vaccines collaboration with MSD, in addition to the proof-of-concept data generated to date across multiple programs, has validated the MicroRx® platform and 4D pharma's approach to LBP development. We will seek to engage additional new partners that wish to explore the potential of LBPs in disease areas of interest through collaborations.

Future outlook continued

Finally, with net proceeds from the Longevity Merger completed in March 2021 of $11.6 million, the fundraise completed in March 2021 and the overdraft facility in Spain, 4D pharma is funded into Quarter 2 of 2022 providing the Company sufficient balance sheet strength and runway to deliver on a significant number of our short to medium term clinical and strategic goals.

Information about the Group's employees

Information about the Group's employees can be found in our Corporate Governance report on page 24.

The Board has a good relationship with the Group's employees. The Board maintains constructive dialogue with employees through the Chief Executive Officer and other Executive and senior management positions, through virtual 'town hall' all-employee meetings and video conference calls in which management provides updates on strategic progress, and which serve as a forum for answering questions from employees. The Group utilizes multiple internal communications technologies and channels to facilitate communication and collaboration.

The Group is committed to providing a safe and healthy working environment for its employees and to avoiding adverse impact and injury to the environment and the communities in which we do business. To achieve this, Group employees must comply with all applicable external environmental, health and safety laws and other regulations as well as our own internal standards.

Environmental matters

We currently conduct research, development and manufacturing activities in our in-house facilities. We also work with suppliers and service providers to support our activities. These activities are subject to various environmental, health and safety laws and regulations, which govern, among other things, the controlled use, handling, release and disposal of, including the maintenance of a registry for, hazardous materials and biological materials. If we or our partners fail to comply with such laws and regulations, we could be subject to fines or other sanctions.

As with other companies engaged in similar activities, we face a risk of environmental liability that is inherent in our current and historical activities, including liability relating to releases of or exposure to hazardous or biological materials. Environmental, health and safety laws and regulations are becoming more stringent. We may be required to incur substantial expenses in connection with future environmental compliance or remediation activities, in which case, production and development efforts being carried out by ourselves and our partners relating to our products may be interrupted or delayed.

A report on energy consumption and related emissions is included on pages 31 to 32.

Prof. Axel Glasmacher
Non-Executive Chairperson
31 March 2021

Duncan Peyton
Chief Executive Officer
31 March 2021

Key performance indicators

We track a series of metrics focused primarily on science and product development whilst ensuring that the business maintains both sufficient resources and effective allocation of those resources to achieve our strategic goals. The Board and management of 4D Pharma monitor the following metrics as an indicator of how we are progressing towards the goal of advancing our Live Biotherapeutic programs:

1. Successful clinical trials – We are a drug development company and will realise long-term value by successfully progressing its candidates through the clinic to registration and approval. For the year ended 31 December 2020, we had one clinical trial completed through Phase II. For each of the years ended 31 December 2019 and 2018, we had two clinical trials completed through Phase I/Phase II.

2. Clinical trials initiated by phase – Clinical trials are essential in converting the productivity and potential of our MicroRx® platform and early-stage research into long-term value. During 2020 we commenced two new clinical trials, of which one Phase I and one Phase II, this meant that by 31 December 2020, we had initiated eight clinical trials: four Phase I clinical trials; two Phase I/II clinical trials and two Phase II clinical trial. There were three clinical trials that we initiated for year ended 31 December 2018 of two Phase I clinical trials and one Phase II clinical trials.

3. Strategic collaborations – Collaborations enable us to realise the potential of our platform, leveraging the complementary expertise of our partners. For the year ended 31 December 2020, we had four strategic collaborations, and three strategic collaborations for the year ended 31 December 2019. In December 2020 we became an industry partner of the Parkinson's Progression Markers Initiative (PPMI), a longitudinal study sponsored by The Michael J. Fox Foundation for Parkinson's Research to better understand Parkinson's disease and accelerate the development of new treatments. 4D pharma representatives will join the Partner Scientific Advisory Board closely involved in the design and execution of the study, as well as a variety of PPMI Working Groups. After the period end, in February 2021, we announced a clinical trial collaboration and supply agreement with Merck KGaA, Darmstadt, Germany and Pfizer Inc. for Bavencio® (avelumab), under which 4D pharma intends to commence a clinical trial in 2021 to evaluate Bavencio® in combination with MRx0518 as a first-line maintenance therapy for patients with locally advanced or metastatic urothelial carcinoma that has not progressed with first-line platinum-containing chemotherapy. These partnerships are in addition to an ongoing strategic collaboration with the University of Texas MD Anderson Cancer Center, to evaluate 4D pharma's Live Biotherapeutic oncology pipeline across a range of cancer settings, a clinical collaboration with MSD to evaluate MRx0518 in combination with Keytruda®, an anti-PD-1 ICI marketed by MSD, in patients with in patients with metastatic solid tumours that are refractory to prior anti-PD-1/PD-L1 therapy, and a research collaboration and option to license agreement with MSD to discover and develop vaccines derived from our proprietary gut microbiome-derived commensal bacteria selected from our culture collection for use in up to three indications, combining our MicroRx® platform with MSD's world-leading expertise in vaccine development.

4. Intellectual property portfolio – Intellectual property is essential to our strategy and capturing the value of our world-leading research output. We have continued to invest significantly in expanding our intellectual property rights, and by 31 December 2020, had initiated 65 patent families including over 1,000 granted patents providing coverage for our pipeline and clinical-stage candidates, manufacturing innovations and novel diagnostic approaches across major global markets.

5. Cash and equivalents – We continue to invest capital from our shareholders and partners into supporting research and clinical development programs, to generate the critical data to advance this novel modality. See Liquidity and Capital Resources section below for additional information.

6. Research and development spend – Investment in research and development (R&D) is central to our progress and returning long-term value. Our unique approach allows rapid translation from bench to bedside. For the year ended 31 December 2020, our R&D spend was £22.0 million compared to £26.5 million for the year ended 31 December 2019. Whilst we still maintain our strategy to invest in our clinical development programs on a long-term basis, the decrease is reflective of the effects COVID-19 has had on both our clinical trials and structure of the business after management took quick action to reduce costs.

Operating expenses

We recognise operating expenses as they are incurred in two general categories, general and administrative expenses and research and development expenses. Our operating expenses also include non-cash components related to depreciation and amortisation of property and equipment, intangibles, and stock-based compensation, which are allocated, as appropriate to general and administrative expenses and research and development expenses.

General and administrative expenses consist of salaries and related expenses for executive, legal, finance and administrative personnel, as well as professional fees, insurance costs, and other general corporate expenses. Management expects general and administrative expenses to increase in future periods as we add personnel and incurs additional expenses related to an expansion of our research and development activities and our operation as a public company listed on two markets, including higher legal, accounting, insurance, compliance, compensation and other expenses.

Patent spend has increased since 2019 as we continued to add to our significant patent portfolio.

Staff costs increased in 2019 in line with increases in staff numbers before the COVID-19 pandemic occurred in 2020 which resulted in the 4D pharma's Board taking decisive action, reducing staffing levels and staff costs for the year.

Our research and development expenses consist primarily of salaries and related personnel expenses, contractual commitments, depreciation and amortisation, patent costs and other expenses. We charge research and development expenses to operations as they are incurred. Costs are not directly tied to a specific product candidate until such product candidate reaches the clinical trial stage. Product candidates often have more than one associated clinical trial related to different therapeutic areas or clinical indications. Once a product candidate enters a clinical trial, we track costs of such clinical trial but do not track other costs associated with specific clinical indications which are pooled.

Operating expenses continued

The following table discloses the breakdown of research and development expenses:

	31 December 2020 £000	31 December 2019 £000
Contractual commitments including operating lease rentals	**9,346**	12,688
Staff costs	**4,522**	5,027
Depreciation and amortisation	**922**	918
Patent costs	**3,950**	3,633
Other MRx research costs	**2,346**	1,232
Other MDx research costs	**61**	516
Other manufacturing, research and development costs	**894**	2,498
Total	**22,041**	26,512

Over the last year we have continued to lead the development of Live Biotherapeutics, further expanding our clinical development activities - generating clinical data in multiple indications while launching new trials. Meanwhile, we continued to progress promising new LBP candidates in exciting new areas like Parkinson's disease. While we continue to rapidly progress our proprietary development candidates into and through the clinic, we are also leveraging the MicroRx® platform to generate value through partnerships, such as our research collaboration with MSD in the vaccines space which serves as an example of the potential of the platform and provides a valuable endorsement from an industry leading partner.

In 2020 we made significant progress in the clinical development of lead immuno-oncology candidate MRx0518, launching our third clinical trial, in resectable pancreatic cancer. We also generated data from the two ongoing clinical trials of MRx0518 in different treatment settings, completing Part A of a Phase I/II combination study of MRx0518 with Keytruda® in solid tumours refractory to prior anti-PD-1/PD-L1 therapy, and completing Part A of our Phase I study of MRx0518 as a neoadjuvant monotherapy. Following successful completion of Part A, we initiated, expanded and accelerated enrolment of Part B of the MRx0518 and Keytruda® combination study, with the inclusion of additional tumour type cohorts and bringing additional clinical sites on board. We also launched a Phase II clinical trial of MRx-4DP0004 as an oral therapeutic to prevent or reduce the hyperinflammatory response in patients hospitalised with COVID-19. Enrolment for the ongoing Phase I/II trial of MRx-4DP0004 in partly controlled asthma was impacted by the COVID-19 pandemic. A Phase II clinical trial of Blautix® for irritable bowel syndrome with constipation (IBS-C) or with diarrhoea (IBS-D) was completed in the period.

After the period end, in February 2021, we announced a clinical trial collaboration and supply agreement with Merck KGaA, Darmstadt, Germany and Pfizer Inc. for Bavencio® (avelumab), under which 4D pharma intends to commence a clinical trial in 2021 to evaluate Bavencio® in combination with MRx0518 as a first-line maintenance therapy for patients with locally advanced or metastatic urothelial carcinoma that has not progressed with first-line platinum-containing chemotherapy.

With the clinical phase of the Blautix® program now complete, coupled with the three clinical trials of our therapeutic candidate, MRx0518, and the Phase I/II clinical trial of MRx-4DP0004 in partly controlled asthma and Phase II clinical trial of MRx-4DP0004 as an oral therapeutic to prevent or reduce the hyperinflammatory response in patients hospitalised with COVID-19. Despite the ongoing trials above and the anticipated launch of a fourth trail in MRx0518 in 2021 in combination with Bavencio®, we anticipate that our research and development expenses for 2021 will remain at a broadly similar level to that experienced in 2020.

The completion of the Blautix® trial in the early part of 2021 and issues with patient recruitment created by COVID-19 in our Asthma trial reduced overall contractual commitments from £12.7 million in 2019 to £9.3 million in 2020, a decrease of £3.4 million. COVID-19 then provided a point of inflection, with management taking swift action to scale back operations and cut costs or redirect resources across to other areas of study, As such there was a decrease in a number of costs including other MDx research costs and other manufacturing, research and development costs; the latter of which being partly offset by an increase in other MRx research costs as, amongst other items, we furthered manufactured supply and development of MRx518 product.

Comparison of the Year Ended 31 December 2020 to the Year Ended 31 December 2019

Results of Operations

Details of the Group's results of operations are included in the Group statement of total comprehensive income on page 41.

Revenues

We have not generated commercial revenues from product sales. To date, we have generated revenues from the collaboration agreement with MSD. Our revenues from our MSD collaboration agreement totalled £0.5 million and £0.2 million for the years ended 31 December 2020 and 2019, respectively. There were no other revenues for the years ended 31 December 2020 and 2019.

Research and development costs

Our research and development costs totalled £22.0 million for the year ended 31 December 2020, representing a decrease of £4.5 million, or 16.9%, compared to £26.5 million for the year ended 31 December 2019. Although costs for the running of our cancer trials increased by £0.9 million: the completion of the Blautix® Ph II clinical trial in the first half of the year meant that there were no significant second half costs when compared to 2019, this created an overall reduction in costs when compared to the full year for 2019 equating to £1.9 million. Furthermore, the cumulative effect of COVID-19 which both slowed recruitment for our Asthma trails and triggered a number of costs reduction exercises to extend the cash runway resulting in an overall decrease in costs in other areas of £3.5 million when compared to 2019.

Comparison of the Year Ended 31 December 2020 to the Year Ended 31 December 2019 continued

Administrative expenses

Our administrative expenses totalled £9.1 million for the year ended 31 December 2020, representing an increase of £4.7 million, or 106.8%, compared to £4.4 million for the year ended 31 December 2019. The single largest component of the change being attributable to recognition in value of the warrants provided as part of the February 2020 fundraise through the issue of shares which equated to £3.1 million. An additional £2.1m million was incurred in relation to the exploration of funding options, NASDAQ readiness and restructuring costs when comparing the year ended 31 December 2020 to 2019. However, savings on travel, staff and other costs after restructuring and COVID-19 created savings of £0.5 million. Administrative expenses are mainly attributed to staff costs, contractual commitments and legal and professional expenses.

Foreign currency losses (gains)

For foreign currency transactions included in the statement of total comprehensive income, the exchange rates applicable to the relevant transaction dates are used. Transaction gains or losses arising from changes in the exchange rates used in the translation of such balances are included in operating losses. We recognised foreign currency gains of £0.3 million for the year ended 31 December 2020, compared to foreign currency losses of £1.0 million for the year ended 31 December 2019. The change is due to movements in the exchange rates.

Other income

Other income consists of government grants income for a specific research project and there was a small increase arising from increase in grant based research activity over the prior year.

Operating loss before non-recurring items

As a result of the foregoing, our operating loss before non-recurring items totalled £30.2 million for the year ended 31 December 2020, representing a decrease of £1.4 million, or 4.4%, compared to £31.6 million for the year ended 31 December 2019.

Non-recurring income

There were no non-recurring items during the year to 31 December 2020, the prior year included income from the change in fair value of the contingent consideration payable of £2.7 million. This arose as the probability of achieving the time- based endpoints of the payment milestones for the MDx platform either dropped to zero or failed, releasing prior provisions.

Finance income and expense

Interest income consists of interest earned on our short-term investments. Reductions in finance income over time have been attributable to the reduction in short-term investment interest. Finance expense decreased from £0.5 million at 31 December 2019 to £0.2 million at 31 December 2020 (a decrease of £0.3 million or 60%). The higher figure in 2019 was the result of residual unwinding discounts for the milestone payments on the contingent consideration. With the failure of time-based endpoints for the milestone payments no further unwinding discounts were needed in 2020.

Taxation

Taxation consists of UK and Irish research and development tax credits, deferred tax movements and US tax. Research and development tax credits are based on a portion of our research and development expenses. Taxation was £4.4 million for the year ended 31 December 2020, representing a decrease of £1.0 million, or 18.5%, compared to £5.4 million for the year ended 31 December 2019. The decrease was made up of a £1.9 million reduction in tax credit and being partly offset by the release of deferred tax liabilities against deferred tax losses which released £0.9 million to the income statement. Research and development tax credits were reduced due to lower research expenditure and a higher proportion costs through the less favourable Research and Development Expenditure Credit (RDEC) scheme.

Net loss

As a result of the foregoing, our net loss was £25.9 million for the year ended 31 December 2020, representing an increase of £1.8 million, or 7.5%, compared to £24.1 million for the year ended 31 December 2019.

Exchange differences on translating foreign operations

Exchange differences on translating foreign operations arise on consolidation. Exchange differences on translating foreign operations provided reported income of £0.1 million for the year ended 31 December 2020 representing a decrease of £0.3 million or 75.0% on the £0.4 million for the year ended 31 December 2019.

Loss for the year and total comprehensive income for the year

The loss and comprehensive income for the year ended 31 December 2020 was £25.8 million, an increase of £2.1m or 8.9% over the £23.7m for the year to 31 December 2019.

Liquidity and capital resources

Overview

Since our inception through 31 December 2020, the majority of our funding of our operations has come from the issuing of ordinary shares; further income from research and development tax credits and the MSD collaboration agreement have also assisted in this funding. As of 31 December 2020, we had £8.8 million in cash and cash equivalents.

The table below presents our cash flows for the periods indicated:

	31 December 2020 £000	31 December 2019 £000
Cash used in operating activities	**(22,673)**	(21,556)
Cash (used in) / provided by investing activities	**(178)**	9,622
Cash provided by / (used in) financing activities	**27,790**	(283)
Net increase / (decrease) in cash and cash equivalents	**4,939**	(12,217)

Operating activities

Net cash used in operating activities of £22.7 million during the year ended 31 December 2020, was primarily related to £14.2 million for clinical trials and research including other third-party expenses and an aggregate of £5.6 million in salary and other staff costs, a further £4.0 million is attributable to patent spend. These expenses were offset by the £5.3 million in research and development tax credits. Net cash used in operating activities of £21.6 million during the year ended 31 December 2019, were primarily related to £15.0 million for clinical trials and research including other third-party expenses and an aggregate of £6.5 million in salary and other staff costs, a further £4.2 million is attributable to patent spend. These expenses were offset by the receipt of the £1.9 million upfront payment related to the MSD collaboration agreement and £4.6 million in research and development tax credits.

Investing activities

Net cash used in investing activities of £0.2 million during the year ended 31 December 2020, was due to the purchases of property and equipment and software. Net cash provided by investing activities of £9.6 million during the year ended 31 December 2019, was due to the maturities of short-term investments of £10.2 million, offset, in part, by net purchases of property and equipment and software of £0.6 million.

Financing activities

Net cash provided by financing activities of £27.8 million during the year ended 31 December 2020 was primarily related to the issuance of ordinary shares and warrants for £28.1 million net of fees. Lease and associated interest payments amounted to £0.4 million in costs for both the years ended 31 December 2020 and 31 December 2019 which was partly offset in 2019 by interest received on investing activities of £0.1 million.

In July 2020, we completed the issue of 21.9 million ordinary shares at £0.35 per share for a total of approximately £7.7 million or £7.1 million net of transaction costs.

In February 2020, we completed the issue of 44 million ordinary shares at £0.50 per share for a total of £22.0 million or £20.9 million net of transaction costs (which included warrant costs). Warrants were also issued on the basis of one warrant for every two shares acquired. Warrants have an exercise price of £1.00 per share, are immediately exercisable and expire five years from issuance and £0.1m warrants have been redeemed to date.

Current outlook

We have financed our operations to date primarily through proceeds from issuing our ordinary shares. We have incurred losses and generated negative cash flows from operations since inception. To date we have not generated significant revenue, and we do not expect to generate significant revenues from the sale of our product candidates in the near future. In order to capture the potential of the platform and maximise value creation, we are actively pursuing additional research collaborations, pairing our expertise in LBP discovery and development and access to our library of well characterised bacterial isolates with the disease-specific expertise of partners. The amounts that we actually spend for any specific purpose may vary significantly and will depend on a number of factors, including, but not limited to, our research and development activities and programs, clinical testing, regulatory approval, market conditions, and changes in or revisions to our business strategy and technology development plans. Investors will be relying on the judgment of our management regarding the application of the proceeds from the sale of our ordinary shares.

As of 31 December 2020, our cash and cash equivalents were £8.8 million. After the year end, but before the signing of these financial statements, the Group had three significant funding events:

- In October 2020, we entered into a Merger Agreement with Longevity Acquisition Corporation. On approval of the transaction on 18 March 2021 Longevity had $14.8 million in cash equating to approximately $11.6 million (£8.3 million) after fees.
- Concurrently with the Longevity transaction, the Company completed a private placement of new ordinary shares or ADSs raising approximately £18.0 ($25.0) million in gross proceeds (£16.9 million / $23.5 million net of transaction cost), in addition certain of the Directors intend to subscribe for £1.44 million ($2.0 million) in new ordinary shares following the release of these financial statements.
- In March our Spanish subsidiary, 4D Pharma Leon S.L.U. secured an overdraft facility for approximately €1.0 million (£0.9 million) that forms part of the Spanish governments COVID-19 relief package. The overdraft is unsecured, repayable at the end of three years and incurs annual interest at a rate of 2.35%.

Further details of these transactions can be found in note 28.

Liquidity and capital resources continued

Current outlook continued

Excluding possible income from the £21.9 million of outstanding warrants that are convertible to ordinary shares for 100p which have been "in the money" since mid-December through to the NASDAQ listing and warrants in Longevity that have converted to warrants in 4D Pharma which are potentially worth up to a further $29 million we believe that our current cash on hand will be sufficient to fund our projected operating requirements into Quarter 2 of 2022.

We currently anticipate that we will require approximately £31.2 million for research and development activities over the course of the next 18 months based on the execution of existing programs but also dependent on exchange rates. We also anticipate that we will require approximately £12.1 million for general and administrative costs over such 18-month period, which consists primarily of expenditures for staff costs, legal and other professional fees and other administrative expenses. We also anticipate receiving approximately £3.6 million in cash for research and development tax credit refunds over this 18-month period.

In addition, our operating plans may change as a result of many factors that may currently be unknown to us, and we may need to seek additional funds sooner than planned. Our future capital requirements will depend on many factors, including:

- the length of the COVID-19 pandemic and its impact on our planned clinical trials, operations and financial condition;
- the progress and costs of our pre-clinical studies, clinical trials and other research and development activities;
- the scope, prioritisation and number of our clinical trials and other research and development programs;
- any cost that we may incur under in- and out-licensing arrangements relating to our therapeutic candidates that we may enter into in the future;
- the costs and timing of obtaining regulatory approval for our therapeutic candidates;
- the costs of filing, prosecuting, enforcing and defending patent claims and other intellectual property rights;
- the costs of scaling our manufacturing capabilities for production of sufficient clinical and commercial quantities of our therapeutic candidates;
- the potential costs of contracting with third parties to provide marketing and distribution services for us or for building such capacities internally;
- the costs of acquiring or undertaking the development and commercialisation efforts for additional, future therapeutic applications of our product candidates and the magnitude of our general and administrative expenses;
- the timing of payment and changes to tax regimes relate to our research and development tax credits;
- the costs of operating as a public company; and
- adverse trial results that would invalidate further investment in a product or products.

Principal commitments

Leased facilities

We have two real estate leases classified as right-of-use finance leases, one in Spain and one in the UK. No additional leases were entered into during the periods.

The UK lease is for our headquarters in Leeds. The premises comprise office space and parking and are for a ten-year term which commenced in May 2017. A tenant lease break clause is available in May 2022 which has not been included in the lease calculations as there is no indication that this would be executed. Lease escalation costs have been included on a fixed rate basis as a practical expedient. The lease includes a provision to return the premises to their original condition on exit, as such an asset retirement obligation of £0.3 million has been included in the valuation.

The Spanish lease relates to our manufacturing premises in Leon. The agreement is for a ten-year term which commenced in April 2016 and includes a tenant lease break clause that can be executed after providing six months' written notice at any point five years from the commencement date, again this break clause has not been included in the lease value as there is no evidence that this will be executed. Lease escalation costs have also been included on a fixed rate basis as a practical expedient. The lease includes the requirement to make certain repairs and as such an asset retirement obligation of £0.1 million has been included in the valuation.

Contractual commitments and other commitments

Details of contractual and other commitments can be found in notes 19 and 24.

Off-balance sheet arrangements

Except for short term operating leases that do not meet the requirements under IFRS16 to be included as a right-of-use asset and associated lease liability, we have not engaged in any off-balance sheet arrangements, such as the use of unconsolidated subsidiaries, structured finance, special purpose entities or variable interest entities.

We do not believe that our off-balance sheet arrangements and commitments have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that is material to investors.

Strategic Report: Principal risks and uncertainties

The Group operates within a complex regulatory environment, which is subject to change. The nature of drug development exposes the Group to risks and uncertainties which could affect our ability to meet our strategic goals, our business model and our operating environment.

The Board is accountable for carrying out a robust assessment of the principal risks facing the Group, and has developed a risk management framework which provides the structure within which the principal risks affecting our business are managed and sets the tone, culture and appetite for risk. A key part of this framework is the Board's Audit and Risk Committee, responsible for reviewing all aspects of internal control and financial reporting of the business. Further information is provided in the Report of the Audit and Risk Committee on page 26. The key objectives for this process are to ensure that the risk appetite of the Board is embedded throughout the Group and fully understood by all members of the team who have responsibility for managing the risk and making key business decisions. This will then be encoded in systems of internal controls, which will seek to mitigate the principal risks that could affect the strategy and operation of our business model and finally to ensure that identified risks are reported to the relevant stakeholders in a timely manner. We are continuously developing and improving our risk management process through ongoing review and evaluation of the risks, clarifying our risk appetite and reviewing the longer-term viability of the business to make sure that we fully understand our risks and are managing them appropriately.

COVID-19 and other public health pandemics

Description

Our operations and financial results have already been adversely impacted by the COVID-19 pandemic in the United Kingdom, United States and the rest of the world. Enrolment of patients in our clinical trials and maintaining patients in our ongoing clinical trials were delayed or limited to lesser or greater extent as our clinical trial sites limited their onsite staff, temporarily closed or adjusted the way they worked during the COVID-19 pandemic. As a result of measures imposed by the governments in affected regions, many commercial activities, businesses and schools have been suspended as part of quarantines and other measures intended to contain this pandemic. These factors resulting from COVID-19 remain ongoing and other unforeseen pandemics could have similar or worse consequences, delaying the anticipated readouts from our clinical trials and our regulatory submissions. Additionally, certain third parties with whom we engage, including our collaborators, contract organisations, third-party manufacturers, suppliers, clinical trial sites, regulators and other third parties with whom we conduct business were often and can be similarly affected, adjusting their operations and assessing their capacity in light of the COVID-19 and other pandemics. While the extent of the impact of the current COVID-19 pandemic on our future business and financial results continues to carry uncertainty, the effect of a continued and prolonged public health crisis from further significant mutations to COVID-19 or other pandemics could have a material negative impact on our business, financial condition and operating results.

Mitigation and development to date

The Group has taken reasonable measures to protect the safety of its staff, its patients, and its partners. The Group's IT infrastructure and supplementary technological solutions have been utilized effectively to minimize disruption. 4D maintains close communication with its lead investigators and other clinical site staff, monitoring events closely so as to be able to respond to the evolving situation and reduce risk to patients and staff primarily, while minimizing disruption to clinical timelines. It is reasonable to expect that as SARS-CoV-2 vaccines are rolled out in the UK, US and other countries the disruption of the pandemic will reduce.

Change

Reduced risk

Further successful development of product candidates

We are very early in our development efforts and may not be successful in our efforts to use our platform to build a pipeline of therapeutic candidates and develop marketable drugs. Our therapeutic candidates are Live Biotherapeutics Products, which are an unproven approach to therapeutic intervention. Even if our therapeutic candidates do not cause off target adverse events, there may be immunotoxicity associated with the fundamental pharmacology of our therapeutic candidates. Even if any of our therapeutic candidates receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, hospitals, third-party payors and others in the medical community necessary for commercial success. We expect to depend on collaborations with third parties for the research, development, and commercialization of certain of the therapeutic candidates we may develop. If any such collaborations are not successful, we may not be able to realize the market potential of those therapeutic candidates. We rely, and expect to continue to rely, on third parties to conduct our clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials, research and studies.

Mitigation and development to date

The nature of Live Biotherapeutics means they have a lower early clinical development risk. Our diverse portfolio, of unique drug candidates with distinct modes of action across key therapeutic areas, mitigates the risk of failure of any one program to the Group's operations. We have brought in additional expertise and experience with new Non-Executive Directors and senior management. To supplement internal expertise, we work with highly competent clinical research organizations (CROs) to conduct our clinical trials to the highest standard. We are collaborating with multinational pharmaceutical companies with extensive expertise in successful product development, registration and commercialization.

Change

No change

Manufacturing

Description

Currently, we are dependent on the manufacturing of product for each of our therapeutic candidates at our internal manufacturing facility. Developing our in-house manufacturing facility, required and continues to require substantial additional funds and hiring and training a significant number of qualified employees to staff this facility. We may not be able to develop commercial-scale manufacturing facilities that are able to produce an adequate supply of materials in the event of significant commercial uptake of one of our LBP therapeutics. We have not yet manufactured our therapeutic candidates at commercial scale, and if we decide to expand our own manufacturing facility, we cannot assure you that we can manufacture our therapeutic candidates in compliance with regulations at a cost or in quantities necessary to make them commercially viable. If we are found to no longer comply with current good manufacturing practice (cGMP) regulations or similar regulatory requirements outside of the United States or if we cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA, EMA or others, we will not be able to secure and/or maintain marketing approval for our manufacturing facility or any future facilities. Catastrophic events at our manufacturing facility or loss of our master cell banks could significantly impair our ability to manufacture our therapeutic candidates.

Mitigation and development to date

We have significantly invested in our in-house manufacturing facility for our therapeutic candidates for production at a commercial scale. We have taken multiple LBP candidate strains through process development and scale-up to be able to manufacture clinic-ready product. Our in-house facility has the ability to produce cGMP drug product, with capacity to support our ongoing trials and potentially small-scale commercial supply. We are investigating external manufacturing capability as we scale our therapeutic candidates and prepare for commercialization of one or more of our therapeutic candidates. Having in-house control of production has been a significant advantage in a field that has experienced significant hurdles relating to manufacturing, and the equipment and facilities employed in the manufacture of pharmaceuticals are subject to stringent qualification requirements by regulatory agencies, including validation of facility, equipment, systems, processes and analytics. In the event of a catastrophic failure or destruction of our master cell banks, recreating and recertifying our cell banks is possible, as we have back-up stocks of our clinical candidates stored remotely from the MCBs, but not certain and could put at risk the supply of our therapeutic candidates for preclinical studies or clinical trials or any products, if approved, to our customers.

Change

No change

Failure to obtain regulatory approvals

Description

The regulatory approval processes of the MHRA, FDA, EMA and other comparable foreign regulatory authorities are lengthy, time consuming and inherently unpredictable. The clinical trials of our therapeutic candidates may not demonstrate safety and efficacy to the satisfaction of the MHRA, FDA, EMA or other comparable foreign regulatory authorities or otherwise produce positive results. If we experience delays or difficulties in the enrolment of patients in clinical trials, our regulatory submissions or receipt of necessary regulatory approvals could be delayed or prevented. All of our LBP candidates are based on single strains of commensal bacteria. We have not, nor to our knowledge has any other company, received regulatory approval for an oral therapeutic based on this approach. We cannot be certain that our approach will lead to the development of approvable or marketable products. In addition, our LBPs may have different safety profiles and efficacy in various indications. Finally, regulatory agencies may lack experience in evaluating the safety and efficacy of products based on live bacteria, which could result in a longer than expected regulatory review process, increase our expected development costs and delay or prevent commercialization of our therapeutic candidates. If we are ultimately unable to obtain regulatory approval of our therapeutic candidates, we will be unable to generate product revenue and our business will be substantially harmed.

Mitigation and development to date

We have continued to invest in the recruitment, training and upskilling of our clinical and regulatory teams. We have also this year brought in additional regulatory expertise and experience to our Board and senior management team. In addition to continuing to develop our internal expertise, we utilize highly competent regulatory consultants. We have successfully engaged regulators in multiple jurisdictions. We have now dosed patients with four different Live Biotherapeutic drug candidates, with no serious drug-related adverse events reported to date. This increases our confidence in our thesis of the favorable safety profile of Live Biotherapeutics which reduces early development risk.

Change

No change

Continued compliance with new laws and regulations

Description

Our employees, consultants and contractors may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements or insider trading violations, which could significantly harm our business. Healthcare legislative reform measures may have a negative impact on our business and results of operations. The withdrawal of the United Kingdom from the EU, commonly referred to as 'Brexit,' may adversely impact our ability to obtain regulatory approvals of our therapeutic candidates in the EU, result in restrictions, delays or increased costs for importing our therapeutic candidates into the EU, and may require us to incur additional expenses in order to develop, manufacture and commercialize our therapeutic candidates in the EU. If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

Mitigation and development to date

We have adopted a robust compliance program with precautions to prevent, deter and identify employee misconduct. We regularly review and seek to improve our operational, financial and management controls, reporting systems and procedures. The management team and their legal advisors continually monitor the legal and regulatory environment to prepare for, and ensure compliance with, and changes in laws or regulations.

Change

No change

Brexit

Description

The withdrawal of the United Kingdom from the EU, commonly referred to as 'Brexit,' may adversely impact our ability to obtain regulatory approvals of our therapeutic candidates in the EU, result in restrictions or imposition of taxes and duties for importing our therapeutic candidates into the EU, and may require us to incur additional expenses in order to develop, manufacture and commercialize our therapeutic candidates in the EU, negatively affect our ability to attract and retain employees particularly those from the EU, and make travel by our employees between our UK, Irish and Spanish facilities more difficult, time-consuming and expensive than previously was the case. Our business may incur VAT in EU states where it is not established and does not make supplies. The detail of how the United Kingdom's access to the European single market for goods, capital, services and labor within the EU, or single market, and the wider commercial, legal and regulatory environment will impact our operations remains to be fully understood. There may continue to be economic uncertainty surrounding the consequences of Brexit, which could adversely affect our business, revenue, financial condition, results of operations. The full impact of Brexit on our business remains unclear.

Mitigation and development to date

While our headquarters are in the United Kingdom, we have subsidiaries elsewhere in the EU, currently in Ireland and Spain. This is helpful to us since having an 'establishment' in the EU is now required for compliance with a number of relevant regulatory matters, for example a clinical trials sponsor must either be established in the EU or, if not, appoint a legal representative in an EU27 country. Following negotiations, the UK and EU agreed on a Trade and Cooperation Agreement (TCA) on 24 December 2020 to regulate their post-Brexit trade relationship. The EU has agreed to the TCA's provisional application for a short period, and we continued to closely monitor developments relating to the UK's trade, legal and regulatory relationship with the EU which impact our operations or the wider industry.

Change

Reduced risk

Cyber-security risks including loss of data

Description

Our internal computer systems, or those of any of our CROs, manufacturers, other contractors or consultants or potential future collaborators, may fail or suffer security or data privacy breaches or other unauthorized or improper access to, use of, or destruction of our proprietary or confidential data, employee data, or personal data, which could result in additional costs, loss of revenue, significant liabilities, harm to our brand and material disruption of our operations. The collection, processing and cross-border transfer of personal information is subject to restrictive laws and regulations.

Mitigation and development to date

The Group employs internal IT controls, procedures and other security measures to reduce the risk of security or data privacy breaches or other unauthorized or improper access to data or personal information. The collection, processing, transfer and storage of data is tightly controlled. We mandate the use of basic IT security protocols to all our staff and conduct periodic training to ensure all staff are able to use our IT systems effectively, safely and securely.

Change

No change

Intellectual property

Description

If we are unable to obtain and maintain patent and other intellectual property protection for any therapeutic candidates we develop, or if the scope of the patent and other intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize products and technology similar or identical to ours, and our ability to successfully commercialize any therapeutic candidates we may develop may be adversely affected. We may become involved in lawsuits to protect or enforce our patents, which could be expensive, time consuming, and unsuccessful and could result in a finding that such patents are unenforceable or invalid. Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment, and other requirements imposed by government patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements. Changes in patent law could diminish the value of patents in general, thereby impairing our ability to protect our therapeutic candidates. If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed. Third parties may assert that our employees, consultants, or advisors have wrongfully used or disclosed confidential information or misappropriated trade secrets.

Mitigation and development to date

We are diligent in carrying out searches to identify potential third-party IP; a comprehensive freedom to operate strategy has been developed and implemented to ensure that no blocking patents owned by third parties are unexpectedly granted. The third-party patent landscape is under continuous review. To ensure that we are in the strongest possible position in the event of any patent dispute, the Group continues to make patent filings across the Group's technology portfolio. There have been a significant number of patents granted since the inception of 4D pharma with a substantial year-on-year growth of the portfolio and an increasing number of new applications filed.

Change

No change

Availability of finance

Description

Since its inception the Group has incurred losses as it seeks to take its candidates through development to an approved product. The Group does not yet have any approved or revenue generating products, and expects to make losses for the foreseeable future. We may not be able to raise additional funds that may be needed to support development and commercialization of our product candidates and any additional funds that are raised could cause dilution to existing investors.

Mitigation and development to date

The Directors continue to keep a close control of overheads and explore sources of finance available. After the period end, in March 2021 the Company completed the merger with Longevity, gross proceeds from this transaction total approximately $14.8 million. The Company also completed a fundraise in March 2021 by way of a private placement raising gross proceeds of approximately £17.3 million ($24.0 million) with certain directors also intending to subscribe for a further £1.4 million ($2.0 million) in shares once the Company has released its financial results. In March 2021 our Leon entity also subscribed for a COVID-19 relief loan provided backed by the Spanish Government, the loan is for €1 million, is unsecured, is charged at an annual interest rate of 2.35% and is repayable in t three years. The Group has continued to a prioritize key activities and cost saving measures, and the Company's cash sufficiency is now likely to extend until Q2 of 2022.

Change

No change

Constraints in the growth of the Group

In order to successfully implement our plans and strategies, we will need to grow the size of our organization, and we may experience difficulties in managing this growth. Our future success depends in part upon our ability to retain key employees, including Directors and Executive Officers, and to attract, retain and motivate qualified individuals. Management may need to expend additional effort and resources identifying, recruiting, integrating, maintaining and motivating additional employees.

Mitigation and development to date

During the period, and after the period end in Q1 2021, we made a number of key appointments to senior positions which will be key to fostering the continued growth of the Company, including international growth particularly in the US where we now have multiple employees.

Change

No change

Exchange rate risks

Description

Exchange rate fluctuations may adversely affect our results of operations and cash flows. Our functional currency is Pounds Sterling, and our transactions are commonly denominated in that currency. However, we receive payments under our collaboration agreements in US Dollars and we incur a portion of our expenses in other currencies, primarily Euros. As a result, fluctuations in exchange rates, particularly between the Pound Sterling on the one hand and the US Dollar and Euro on the other hand, may adversely affect our reported results of operations and cash flows. Since the Brexit referendum in 2016, there has been a significant increase in the volatility of these exchange rates and an overall weakening of the Pound Sterling. Our business may be affected by fluctuations in foreign exchange rates between the Pound Sterling and these and other currencies, any of which may have a significant impact on our results of operations and cash flows from period to period.

Mitigation and development to date

We constantly monitor currencies and their movements against Sterling. As the Group is currently pre-revenue, the exposure affects the cost of operations and although the size of the exposure is significant, we regularly review cash resources to manage these changes and have planned these prudently into our forward forecasts.

Change

No change

The Strategic report was approved by Board on 31 March 2021 and signed on its behalf by:

Duncan Peyton
Chief Executive Officer
31 March 2021

Corporate governance: Corporate Governance Report

Chairman's introduction

On behalf of the Board, I am pleased to present our Corporate Governance Report for the year ended 31 December 2020.

This section of the Annual Report describes the Group's corporate governance structures and processes and how they have been applied during the year ended 31 December 2020. As Chairman, I am responsible for the leadership of the Board, ensuring its effectiveness in all aspects of its functions and, within that role, for promoting good governance throughout the Group.

The Board recognizes the importance of good corporate governance and has, since the Company's initial public offering and as the Group has grown, maintained a regular review and evaluation of its effectiveness, and that of the wider governance structure of the Group.

I believe that the Company's governance structure has facilitated the growth and development of the Group, while remaining accountable to all of its stakeholders, including shareholders, employees, collaborators and regulators. As the Group continues to grow, we will continue to evaluate this structure and will take the governance steps necessary to support the Group's development.

Prof. Axel Glasmacher
Non-Executive Chairman
31 March 2021

The Quoted Companies Alliance Code

The AIM Rules for Companies require the Board to apply a recognized corporate governance code. The Board has chosen to formally apply the Quoted Companies Alliance Corporate Governance Code, updated in 2018 (the 'QCA Code'). The QCA Code was developed by the Quoted Companies Alliance, an independent membership organisation championing the interests of small to mid-sized quoted companies, one of whose aims is to promote high quality corporate governance in quoted companies. In consultation with a number of significant institutional small company investors, it has developed the QCA Code as an alternative corporate governance code applicable to quoted companies that do not have a premium listing of equity shares, including AIM companies.

The QCA Code is constructed around 10 broad principles and a set of disclosures grouped under three broad headings: deliver growth; maintain a dynamic management framework; and build trust.

Strategy and business model

The strategic report outlines the Group and Company strategy and business model in detail and can be found on pages 5 to 12.

Board composition and responsibility

The Board consists of seven Directors, five of whom are Non-Executive. The names of the Directors, together with their biographical details, are set out on pages 28 and 29. Two Directors resigned in the course of 2020, Thomas Engelen (on 21 May) and David Norwood (on 30 September), and one Director was appointed in the course of 2020, Dr .Katrin Rupalla (on 18 August). After the period end, in March 2021, Paul Maier was appointed as a Non-Executive Director and the chairman of the Audit and Risk Committee.

The Board has determined that each of Dr. Ed Baracchini, Prof. Axel Glasmacher, Dr. Sandy Macrae, Paul Maier and Dr. Katrin Rupalla are independent in character and judgement, and that there are no relationships or circumstances which could materially affect or interfere with the exercise of their independent judgement.

In identifying candidates for the Board of Directors the Company identifies both weaknesses and complimentary attributes in the existing skill sets, experience and viewpoint of Directors to create overall balance across the Board. In doing so, during the current year a lack of gender diversity was identified within the Board and positive first steps were taken towards redressing balance through the appointment of Dr. Katrin Rupalla.

The Board is satisfied with its composition and the balance between Executive and Non-Executive Directors, which allows it to exercise objectivity in decision making and proper control of the Group's business.

The Board considers that its gender diversity is acceptable and will continue trying to balance its representation as roles on the Board become available.

Decision making

The Board's primary objective is to focus on adding value to the assets of the Group by identifying and assessing business opportunities and ensuring that potential risks are identified, monitored and controlled.

Material issues are reserved to a decision of the Board, including approval (and review of performance) of the Group's strategic aims and objectives; approval of the annual operating and capital expenditure budgets (and any material changes to them); approval of all financial statements and results; and maintenance of a sound system of internal control and risk management. The implementation of Board decisions and day-to-day operations of the Group are delegated to Executive Directors.

The Board meets both at regular intervals and also at short notice to consider specific matters (for example proposed material transactions). The Board receives appropriate and timely information prior to each meeting, with a formal agenda and Board and Committee papers being distributed several days before meetings take place. Any Director may challenge Group proposals and decisions are taken democratically after discussion.

Any Director who feels that any concern remains unresolved after discussion may ask for that concern to be noted in the minutes of the meeting. Any specific actions arising from such meetings are agreed by the Board and then followed up by management.

The Non-Executive Directors constructively challenge and help develop proposals on strategy and bring strong, independent judgement, knowledge and experience to the Board's deliberations. The Directors are given access to independent professional advice at the Group's expense when the Directors deem it is necessary in order for them to carry out their responsibilities.

The Group has effective procedures in place to deal with conflicts of interest. The Board is aware of other commitments of its Directors and changes to these commitments are reported to the Board.

Appointment and re-election of Directors
Each of the Directors is subject to retirement by rotation and re-election in accordance with the articles of association of the Company. All Directors appointed by the Board are subject to election by shareholders at the first Annual General Meeting after their appointment.

Board evaluation
Given its composition and flexibility, the Board has been able, since the admission of the Company's shares to trading on AIM, to maintain a regular evaluation of its effectiveness and that of its Committees. It is believed that the Board and its Committees have functioned well throughout this period, meeting with appropriate regularity and with Directors free to voice differing opinions. In particular, the Board considers its composition to be appropriate (in view of the size and requirements of the Group's business, and the need to maintain a practical balance between Executives and Non-Executives). As the business of the Group grows and evolves, the Board continues to actively consider potential candidates to occupy Board positions.

Committees
The Board has established an Audit and Risk Committee and a Remuneration Committee, with formally delegated duties and responsibilities. The Board has, since the admission of the Company's shares to trading on AIM, kept under regular review the possible establishment of a Nomination Committee. The Board remains of the view that, given the current composition of the Board, it is not appropriate to have a Nomination Committee. This will continue to be kept under regular review by the Board.

The Audit and Risk Committee
The Audit and Risk Committee comprises Paul Maier as Chairman alongside Dr. Ed Baracchini and Prof. Axel Glasmacher as the other members of the Committee. Paul Maier is an independent Director and has recent and relevant financial expertise. The Committee's responsibilities include:

- monitoring the integrity of our financial and narrative reporting, preliminary announcements and any other formal announcements relating to our financial performance;
- advise the Board on whether, taken as a whole, the Annual Report and Accounts are fair, balanced and understandable;
- reviewing the appropriateness and completeness of our risk management and internal controls;
- considering annually whether we should have an internal audit function;
- overseeing our relationship with the external auditors and assessing the effectiveness of the external audit process, including in relation to appointment and tendering, remuneration and other terms of engagement, and appropriate planning ahead of each annual audit cycle;
- maintaining regular, timely, open and honest communication with the external auditors, ensuring the external auditors report to the committee on all relevant matters to enable the committee to carry out its oversight responsibilities; and
- monitoring risk.

The Remuneration Committee
The Company has established a formal and transparent procedure for developing policy on Executive remuneration and for fixing the remuneration packages of individual Directors and senior management. The Remuneration Committee comprises Dr. Sandy Macrae as Chairman and Prof. Axel Glasmacher as the other member of the Committee.

The Remuneration Committee's responsibilities additionally include:

- setting a remuneration policy that is designed to promote our long-term success having due regard to the interests of shareholders;
- ensuring that the remuneration of Executive Directors and other senior executives reflects both their individual performance and their contribution to our overall results;
- determining the terms of employment and remuneration of Executive Directors and other senior executives, including recruitment and retention terms;
- approving the design and performance targets of any annual incentive schemes that include the Executive Directors and other senior executives;
- agreeing upon the design and performance targets, where applicable, of all share incentive plans;
- gathering and analysing appropriate data from comparator companies in the biotechnology sector; and
- the selection and appointment of external advisors to the Remuneration Committee, if any, to provide independent remuneration advice where necessary.

The Board believes that the Audit and Risk Committee and the Remuneration Committee have the necessary character, skills and knowledge to discharge their duties and responsibilities effectively; notwithstanding that (given the overall composition of the Board) there is a majority of members who are independent Non-Executive Directors. Each Committee is chaired by an independent Non-Executive Director.

Corporate culture and wider stakeholders
The Board recognizes the need, and strives, to promote a corporate culture based on strong ethical and moral values, maintaining high standards of integrity and probity in the conduct of the Group's operations. This culture is promoted throughout its employees.

The Group encourages its employees to understand all aspects of the Group's business and seeks to remunerate its employees fairly, being flexible where practicable. The Group gives full and fair consideration to applications for employment received regardless of age, gender, color, ethnicity, disability, nationality, religious beliefs, transgender status or sexual orientation. The Board takes account of employees' interests when making decisions, and suggestions from employees aimed at improving the Group's performance are welcomed.

Details of our commitment to our wider stakeholders and social responsibilities is included in the Strategic report: Director and Chairman's statements under the Section 172 Companies Act 2006 header.

Approach to risk and internal control

The Board is responsible for establishing and maintaining the Group's systems of internal control. The primary responsibility for monitoring the quality of internal control has been delegated to the Audit and Risk Committee. Reference is made to the Principle risks and uncertainties on pages 18 to 22.

Communicating vision and strategy

We are committed to communicating openly with our shareholders to ensure that our strategy and performance are clearly understood. The Directors seek to engage with institutional shareholders at least twice a year. In addition, all shareholders can attend the Company's Annual General Meeting, where there is an opportunity to question the Directors as part of the agenda, or more informally after the meeting. A range of corporate information (including all 4D announcements) is also available to shareholders, investors and the public on our website.

Meeting attendance in 2020

	Full Board	Audit and Risk Committee	Remuneration Committee
Number of meetings in year	21	4	2
Attendance:			
Executive Directors			
Duncan Peyton	21	—	—
Dr. Alex Stevenson	21	—	2*
Non-Executive Directors			
Dr. Ed Baracchini	21	2	—
Thomas Engelen	7[1]	2	—
Prof. Axel Glasmacher	21	1	2
Dr. Sandy Macrae	20	—	2
David Norwood	16[2]	3	—
Dr. Katrin Rupalla	6[3]	—	—
Paul Maier	-[4]	—	—

1. Mr. Thomas Engelen left the 4D pharma Board of Directors in May 2020.
2. Mr. David Norwood left the 4D pharma Board of Directors in September 2020.
3. Dr. Katrin Rupalla joined the 4D pharma Board of Directors in September 2020.
4. Paul Maier joined the 4D pharma Board of Directors after the period end, in March 2021

* Dr. Alex Stevenson attends the Remuneration Committee meeting to provide recommendations and updates for share option awards to senior management

Details of voting information and recent announcements can be found within the RNS announcements (http://www.4dpharmaplc.com/investors/rns) and SEC Filings (http://www.4dpharmaplc.com/en/investors/sec-filings) section on our website.

Corporate governance: Report of the Audit and Risk Committee

The Committee acts independently of management to ensure the interests of shareholders are protected in relation to financial reporting, internal controls and risk management.

As Chairman of the Audit and Risk Committee, I am pleased to present our report for the year ended 31 December 2020. The Audit and Risk Committee is a sub-committee of the Board and is responsible for reviewing all aspects of the financial reporting of the business and all aspects of internal control. The Committee represents the interests of our shareholders in relation to the integrity of information and the effectiveness of the audit processes in place.

Key responsibilities

The principal duties of the Committee are to:

- monitor the integrity of the Group's financial reporting including the review of significant financial reporting judgements;
- advise the Board on whether, taken as a whole, the Annual Report and Accounts is fair, balanced and understandable;
- advise the Board on principal risks, their mitigation and risk appetite;
- review the robustness of our risk management and internal controls;
- oversee the external audit process including monitoring the auditor's independence, objectivity, effectiveness and performance; and
- approve any engagement by the external auditor outside of the Group's audit.

The Committee manages the relationship with the external auditor on behalf of the Board to ensure that the external auditor continues to be independent, objective and effective in its work, and also considers the re-appointment of the auditor each year.

RSM UK Audit LLP was appointed as auditor in 2014 following a comprehensive tender process. Each year the Committee considers the continued independence of the external auditor and the effectiveness of the external audit process, to determine whether to recommend to the Board that the current auditor be re-appointed.

The Committee has reviewed the external audit process in the year through meetings and reviewing the reports from the external audit team. The Committee has concluded that the external audit process was effective and is satisfied that the scope of the audit is appropriate and that significant judgements have been robustly challenged.

Composition and meetings

The Audit and Risk Committee during the year under review has consisted of two Non-Executive Directors. The Committee is chaired by me, Paul Maier, having recently taken over from Dr. Ed Baracchini, who himself took over the role from Thomas Engelen, following his departure from the Board in May 2020. Serving alongside us is Prof. Axel Glasmacher (taking over this role from David Norwood, following his resignation from the Board in September 2020) as the other member. I am an independent Director and have recent and relevant financial experience.

There were four meetings held in the year ended 31 December 2020; these took place in February, May, September and December.

Committee meetings are also attended by the Group Finance Director, and representatives from the external auditor.

Significant issues relating to the financial statements

The specific issues considered by the Audit and Risk Committee in the year under review, in relation to the financial statements, are shown below.

Valuation of goodwill and other intangible assets

Testing of goodwill and other intangible assets for potential impairment is complex and requires a number of management estimates and sensitivities to be applied, which inevitably requires judgment and is a recurring matter.

The forecasting tools developed by management to help assess the values of intangible assets and goodwill were updated for variables that were known to have changed.

The Committee reviewed the reports together with the assumptions, judgments and sensitivities applied to the valuations and underlying models for impairment testing purposes. Following this review and after discussions with management, the Committee is satisfied that there is no impairment to intangible assets or goodwill at this time.

Recoverability of inter-company balances

There are various inter-group balances within the Group. For inter-group balances held with entities in a current or shareholder deficit position there is a potential that these recoverable balances may not be realized in full. On review of these balances an impairment charge of £1,230,208 has been included in the year to 31 December 2020, reflecting the Committee's recognition of the inherent risk involved in the recoverability of inter-company balances and that the disclosures in the financial statements are appropriate.

Paul Maier
Chairman of the Audit and Risk Committee
31 March 2021

Corporate governance: Report of the Remuneration Committee

The Committee aims to attract, retain and motivate the executive management of the Company and set remuneration at an appropriate level.

As Chairman of the Remuneration Committee, I am pleased to present our report for the year ended 31 December 2020.

This report does not constitute a Directors' Remuneration Report in accordance with the Companies Act 2006. As a company whose shares are admitted to trading on AIM, the Company is not required by the Companies Act 2006 to prepare such a report.

Key responsibilities

The Remuneration Committee is a sub-committee of the Board. Its principal purpose is to determine and agree with the Board the framework and broad policy for remuneration, and to determine the remuneration packages and service contracts of the Executive Directors, the Company Secretary and such other members of the executive management as it considers appropriate. Among other things, the Committee shall approve the design of, and determine targets for, any performance incentive schemes operated by the Company and approve the awards made under such schemes.

Composition and meetings

The members of the Committee are me, Dr. Sandy Macrae (taking over this role from Thomas Engelen, following his resignation from the Board in May 2020), an independent Non-Executive Director, and Prof. Axel Glasmacher (taking over this role from David Norwood, following his resignation from the Board in September 2020), the independent Non-Executive Chairperson.

There were two meetings of the Committee held in the year ended 31 December 2020, held in July and December. The meeting was convened to consider and review the Group's remuneration policy, and to approve annual awards to senior management under the Group's Long Term Incentive Plan (LTIP). There were no changes to the remuneration or service agreements of the Executive Directors during the period.

Policy on Executive remuneration

The Committee aims to attract, retain and motivate the executive management of the Company and set remuneration at an appropriate level to promote the long-term success of the Group, in line with its strategic objectives.

The overall policy of the Board is to ensure that executive management is provided with appropriate incentives to encourage enhanced performance and, in a fair and responsible manner, rewarded for its contribution to the success of the Group.

The main elements of the remuneration packages for Executive Directors and senior management are as follows:

Basic annual salary

The base salary of the Executive Directors is reviewed annually. The review process is undertaken by the Remuneration Committee and takes into account several factors, including the current position and development of the Group, individual contributions and market salaries for comparable organizations.

The Company does not provide an occupational pension scheme for Executive Directors, nor does it make contributions into the private pension schemes of Executive Directors.

Discretionary annual bonus

All Executive Directors and senior managers are eligible for a purely discretionary annual bonus. This takes into account exceptional individual contribution, business performance and technical and commercial progress, along with financial results.

Long-term incentives

The Group operates a long-term share incentive scheme; all Group Executive Directors and employees are eligible for the granting of awards under the scheme. Details of the awards made under the scheme during the year are provided in note 22 to the financial statements. All such awards vest after three years and are subject to individual performance criteria. There were no awards during the year to the Directors of the Company.

Benefits in kind

The Company provides taxable healthcare benefits for Executives.

Policy on Non-Executive Directors' remuneration

Non-Executive Directors receive a fixed fee and do not receive any pension payments or other benefits, nor do they participate in bonus or incentive schemes. The Board reviews Non-Executive remuneration to ensure that it is in line with current market rates in order to attract and retain high caliber individuals.

Service contracts

Duncan Peyton and Dr Alexander Stevenson have service agreements with an indefinite term providing for a maximum of 12 months' notice by either party.

The Non-Executive Directors are employed on letters of appointment which may be terminated on not less than three months' notice.

Directors' interests in share capital

At 31 December 2020, Duncan Peyton held 8,359,835 ordinary shares in the Company's share capital, or 6.36% (31 December 2019: 9.9%); Dr. Alexander Stevenson held 8,317,896 ordinary shares in the Company's share capital, or 6.33% (31 December 2019: 9.8%); and Prof. Axel Glasmacher held 30,000 shares in the Company's share capital, or 0.02% (31 December 2019: 0%); David Norwood had retired as a director before 31 December 2020 but held 10.9% at 31 December 2019.

No Director was granted any share options in the year ended 31 December 2020; none of the Directors held any share options at 31 December 2020.

At 31 December 2020, Duncan Peyton held 666,666 warrants and Alex Stevenson held 666,666 warrants. Each warrant can be redeemed for £1.00 to acquire one ordinary share. The warrants were issued to subscribers for shares during the February 2020 sale of shares and there were no other movements in Directors' warrants during the year.

Directors' remuneration

The remuneration of the Directors who served on the Company's Board during the year to 31 December 2020 is as follows:

	31 December 2020			31 December 2019		
	Base salary And fees £000	**Other £000**	**Total £000**	Base salary And fees £000	Other £000	Total £000
Executive Directors						
Duncan Peyton	**100**	**2**	**102**	100	2	102
Dr. Alexander Stevenson	**100**	**2**	**102**	100	2	102
Non-Executive Directors						
David Norwood*	**8**	**—**	**8**	25	—	25
Thomas Engelen**	**10**	**—**	**10**	25	—	25
Dr. Ed Baracchini	**50**	**—**	**50**	50	—	50
Prof. Axel Glasmacher	**50**	**—**	**50**	50	—	50
Dr. Sandy Macrae	**50**	**—**	**50**	17	—	17
Dr. Katrin Rupalla***	**15**	**—**	**15**	—	—	—
Paul Maier****	**—**	**—**	**—**	—	—	—

There were no bonus or pension schemes for the Directors during the years ended 31 December 2020 and 31 December 2019.

* Resigned in September 2020.
** Resigned in May 2020.
*** Appointed in September 2020.
**** Appointed in March 2021.

Board of Directors

As 4D has grown and developed from an R&D organization to a fully-fledged clinical-stage drug development biotech, the Company has made key additions to its Board. The Company appointed one new Non-Executive Director, in addition to a new Chief Financial Officer and a new Chief Business Officer in 2021, bringing valuable experience in the clinical development of novel therapies, biopharma finance and business development activities.

Prof. Dr. Axel Glasmacher, Non-Executive Chairman

Appointment date: April 2020 (current role)

Axel joined our board of directors in January 2019, and he has served as our Chairman since April 2020. Prof. Glasmacher currently serves as the Owner of AG Life Science Consulting GmbH & Co. KG since March 2018. Previously, Prof. Glasmacher served as Senior Vice President, Global Clinical Research & Development at Celgene, from April 2016 to February 2018, as Corporate Vice President, Clinical Research and Development from January 2015 to April 2016, as Head/Vice-President of Medical Affairs for Europe, Middle East, and Africa from 2010 to 2014. From May 2006 to December 2009 he worked as Medical Director for Celgene in Germany. Prior to Celgene, Professor Glasmacher worked within the field of hematology-oncology at the University Hospital in Bonn from August 1988 to April 2006. Prof. Glasmacher currently serves on the board of Active Biotech AB (Lund, Sweden) and Ryvu Therapeutics (Kraków, Poland) as well as the Cancer Drug Development Forum (a non-profit association in Belgium). Prof. Glasmacher holds a Medical Doctorate from and serves as adjunct professor of medicine at the University of Bonn.

Duncan Peyton, Chief Executive Officer

Appointment date: June 2014

Duncan has a proven track record in identifying, investing in and growing businesses within the pharmaceutical sector. He was the founder of Aquarius Equity, a specialist investor in businesses within the life sciences sector, which provided investors with access to innovative, high growth potential companies that delivered significant capital growth. Duncan started his career in a bioscience start-up business, which ultimately went on to list on the London Stock Exchange, subsequently qualified as a corporate finance lawyer with Addleshaw Goddard (then Addleshaw Booth & Co), and later joined 3i plc as an investment manager. Duncan founded Aquarius in 2005, which made founding investments into Nanoco Technologies Limited, Auralis Limited (subsequently sold to ViroPharma), Tissue Regenix Group plc, Brabant Pharma (subsequently sold to Zogenix, Inc.) and C4X Discovery plc. Duncan is a co-founder of 4D pharma plc and has served as Chief Executive Officer since 2014.

Dr. Alex Stevenson, Chief Scientific Officer

Appointment date: June 2014

Alex began his career as a microbiologist, working in research for a number of years before joining an NYSE-quoted drug development company. He subsequently moved into pharmaceutical and healthcare investment and has fulfilled a number of board-level investment and operational management roles. He was a director and shareholder in Aquarius Equity from 2008, where he was responsible for identifying new investments and developing and implementing scientific strategies both pre and post-investment. These included Tissue Regenix Group plc, C4X Discovery Holdings plc and Brabant Pharma (subsequently sold to Zogenix, Inc.). Prior to joining Aquarius Equity, Alex worked for IP Group plc, where he specialized in life sciences investments identifying, developing and advising a number of companies in its portfolio, some of which went on to list on AIM. He joined IP Group following its acquisition of Techtran Group Limited in 2005. Alex is a co-founder of 4D pharma plc and has served as Chief Scientific Officer since 2014.

Board of Directors continued

Dr. Edgardo (Ed) Baracchini, Non-Executive Director

Appointment date: January 2019

Dr. Baracchini served as the Chief Business
Officer of Imago BioSciences, Inc., a biotechnology company, from April 2020 January 2021. Prior to joining us, Dr. Baracchini served as Chief Business Officer at Xencor Inc, from January 2010 to September 2018. Dr. Baracchini has also served as the SVP, Business Development for Metabasis Therapeutics (which was acquired by Ligand Pharmaceuticals, Inc.) from May 2002 to November 2009. Dr. Baracchini currently serves on the board of INmune Bio, Inc., a Nasdaq listed company, and CoImmune, Inc., a privately held company. Dr. Baracchini holds a B.S.in Microbiology from University of Notre Dame, a Ph.D. in Molecular and Cell Biology from the University of Texas at Dallas, and an MBA from the University of California, Irvine — Paul Merage School of Business

Dr. Sandy Macrae, Non-Executive Director

Appointment date: August 2019

Dr. Sandy Macrae has over 20 years of experience in the pharmaceutical industry, with a combination of scientific, medical and commercial expertise. Dr. Macrae currently serves as President and Chief Executive Officer of Sangamo Therapeutics, Inc., a leading genomic medicine company active in developing cell and gene therapies across a range of rare and large indications.

Dr. Macrae has previously served as Global Medical Officer of Takeda Pharmaceuticals, overseeing medical affairs, regulatory affairs, pharmacovigilance, outcomes research and epidemiology, quantitative sciences, and knowledge and informatics. Prior to that, Dr. Macrae held roles of increasing responsibility at GlaxoSmithKline, including Senior Vice President, Emerging Markets Research and Development (R&D), and Vice President, Business Development. Earlier in his career, he worked for SmithKline Beecham, where he was responsible for clinical development in the therapeutic areas of neurology and gastroenterology.

Dr. Katrin Rupalla, Non-Executive Director

Appointment date: September 2020

Dr. Rupalla brings to 4D pharma over 20 years of experience in the pharmaceutical industry, extensive regulatory and clinical expertise in the fields of oncology and neuroscience. Dr. Rupalla has previously served in senior positions at Merck & Co., Roche, Celgene and Bristol-Myers Squibb (BMS). While at BMS, Dr. Rupalla was Vice President Head R&D China and Global Development Team Leader for Opdivo/Yervoy in China, and then Vice President, Head Oncology Global Regulatory Sciences. Throughout her career, she has led regional and global teams responsible for obtaining approvals for multiple new therapeutics and indications, including Opdivo, Yervoy, Rituxan, Xeloda, Avastin, Revlimid and Vidaza, among others.

Dr. Rupalla currently serves as Senior Vice President, Global Head Regulatory Affairs, Medical Documentation and R&D Quality at Lundbeck, a leading biopharmaceutical developing novel therapeutics for diseases of the central nervous system (CNS). She has a PhD in CNS Pharmacology from the Philipps-University Marburg, Germany, and an MBA from Jones International University, CO, US.

Paul Maier, Non-Executive Director

Appointment date: March 2021

Paul Maier has over 25 years of investor and public relations, operational, regulatory, and finance expertise in the healthcare industry. Mr. Maier was previously the Chief Financial Officer of Sequenom Inc., where he was responsible for raising over $360 million in equity and debt financings, expanding institutional sell side research analyst coverage, as well as overseeing and establishing internal financial infrastructure. Previously, he was Senior Vice President and Chief Financial Officer of Ligand Pharmaceuticals (NASDAQ: LGND) where he helped build Ligand from a venture stage company to a commercial, integrated biopharmaceutical organisation, raising over $1 billion in equity and debt financings including a successful IPO, and helped negotiate multiple R&D and commercial partnerships and transactions. He has also acted as an independent financial consultant to life sciences companies. Mr. Maier is currently a Board member of Eton Pharmaceuticals, Inc., Biological Dynamics and International Stem Cell Corporation (OTCQB: ISCO). He holds an MBA from Harvard University and a BS in Business Logistics from the Pennsylvania State University.

Dr. Sandy Macrae
Chairman of the Remuneration Committee
31 March 2021

Corporate governance: Directors' Report

The Directors present their report together with the audited consolidated financial statements, along with the Independent Auditor's Report for the year ended 31 December 2020.

Pages 4 to 84 inclusive (together with sections of the Annual Report incorporated by reference) comprise a Directors' Report that has been drawn up and presented in accordance with and in reliance upon applicable English company law and the liabilities of Directors in connection with that report shall be subject to the limitations and restrictions provided by such law.

Strategic Report

In accordance with section 414C(11) of the Companies Act 2006 and the Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013, the Group has chosen to set out in the Strategic Report information required by schedule 7 of the Large and Medium-sized Companies and Groups (Accounts and Reports) Regulations 2008. Information has been included in the Strategic report rather than the directors report to avoid duplication for the Group's research programs and future developments as these are considered to be of strategic importance to the Group.

Directors

The Directors who held office during the year, and as at the date of signing the financial statements, and brief biographical descriptions of the Directors, are set out on pages 28 and 29.

The beneficial and non-beneficial interests of the Directors in the Company's ordinary shares of 0.25 pence are disclosed in the Report of the Remuneration Committee on page 27.

No Director had an interest in any contract that was significant in relation to the Group's business at any time during the year.

Directors' indemnity insurance

The Group has maintained insurance throughout the year for its Directors and officers against the consequences of actions brought against them in relation to their duties for the Group. Such provision remains in force as at the date of approval of the Directors' Report.

Research and development activities

The principal activity of the Group is research and development, a review of which is included in the Chairman and CEO's Report on pages 7 to 8.

Total research and development spend in the year to 31 December 2020 was £22.0 million (year to 31 December 2019: £26.5 million). No development expenditure was capitalised in the current year or the year to 31 December 2019.

Subsequent events

After the period end, in March 2021 4D pharma completed its merger with Longevity providing the company with $14.8 million in gross proceeds ($11.6 million net of costs), a fundraise by way of a private placement of ordinary shares and ADSs raising gross proceeds of approximately £18.0 million ($25.03 million) or approximately £16.87 million ($23.45 million) net of costs and agreed an unsecured overdraft worth €1.0 million (£0.86 million) which incurs interest at an annual rate of 2.35% and is repayable at the end of three years. Further details can be found in note 28.

Dividends

The Directors do not recommend payment of a dividend nor was there a dividend in the year to 31 December 2019.

Employment policies

The Group is committed to ensuring the health and safety of its employees in the workplace. This includes the provision of regular medical checks.

The Group is committed to keeping employees as fully informed as possible with regard to the Group's performance and prospects and seeks their views, wherever possible, on matters which affect them as employees.

Financial instruments

Details of the Group's financial risk management objectives and policies are disclosed in note 25 to the financial statements.

Share capital and funding

As at 31 December 2020 share capital comprised 131,467,935 ordinary shares of 0.25 pence each. There is only one class of share and all shares are fully paid. No share carries any right to fixed income, and each share carries the right to one vote at general meetings of the Company.

Streamlined Energy and Carbon Reporting

The Group implemented in the period the reporting requirements under the UK government Streamlined Energy and Carbon Reporting (SECR) policy, and the results are shown below.

Under the new SECR legislation we are mandated to include energy consumption, related emissions, intensity metrics and energy efficiency improvements implemented throughout the Group in our most recent financial year.

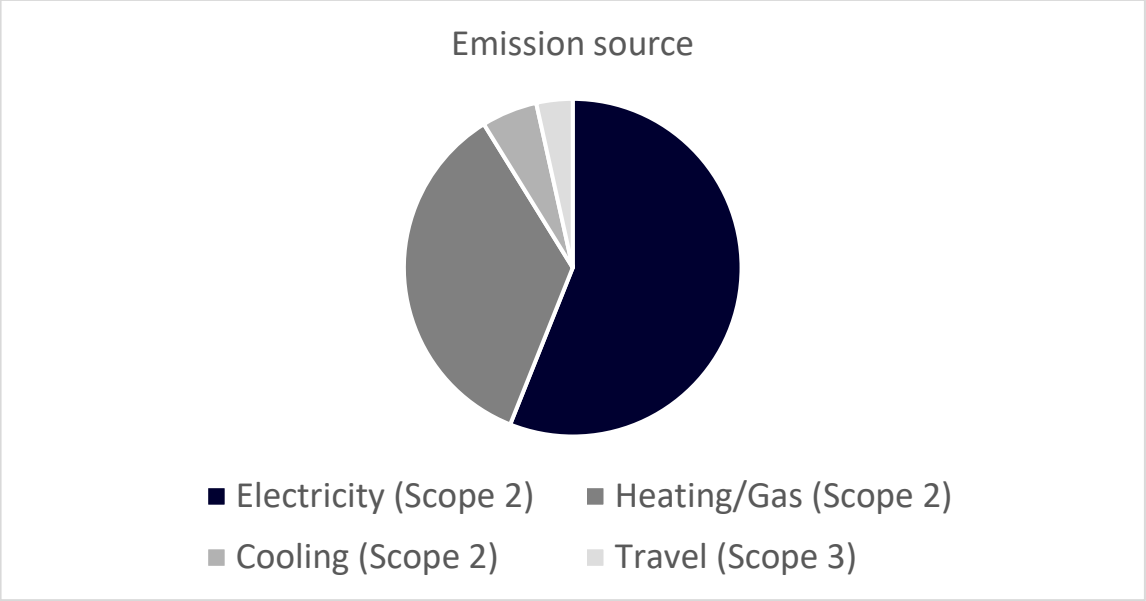
The Company has started the reports on energy consumption and CO_2 emissions in all its sites. The approach has focused initially in evaluating the KwH of energy used and its conversion into CO_2 emissions to the atmosphere. We have analysed energy use and associated emissions from the Group's different sites, and its distribution among several categories: Electricity, Gas, Travel, and Cooling. The conversions have been made from the data provided by our suppliers, and estimates made based on existing information.

The following table shows the distribution of the CO_2 emissions per site, and the global emissions for the Group:

Site	KwH	Kg CO_2e
4D pharma plc (UK)	86,056.0	29,748.3
4D Pharma León S.L.U. (Spain)	1,073,879.3	215,840.0
4D Pharma Research Limited (UK)	250,003.0	57,941.8
4D Pharma Cork Limited (Ireland)	28,303.0	7,743.8
Total (UK)	**336,059.0**	**87,690.1**
Total (Global)	**1,438,241.3**	**311,274.0**

The calculation of 'kg CO_2e' has been made using the 2020 conversion factor for the country of use. For the calculations for UK and Irish sites, 2020 conversion factors have been used. For the site in Spain, 2019 conversion factors have been used as the most recent published official conversion factors.

The following table shows the distribution in the different types of source of emissions:



Scope 1, 2 and 3 consumption and CO_2 emissions have been calculated in line with 2013 UK Government environmental reporting guidance, using the UK Government's 2019 emissions conversion factor database v1.01.

The site with the major contribution to the Group's emissions is 4D Pharma León S.L.U., the manufacturing plant of the Group. After the period end, from January 2021, 4D Pharma León has implemented an Environmental Management System that includes the goals of reduction of emissions and waste.

The Group's Scope 1 direct emissions resulting from combustion of natural gas, transportation fuel or other fuels are negligible. The Group's majority source of emissions are Scope 2 emissions (energy indirect) associated with consumption of purchased electricity, heat and cooling. The majority of this consumption occurs at the manufacturing facility, in León in Spain.

The calculation of emissions associated with air travel has been made using the carbon emissions calculator of ICAO (International Civil Aviation Organisation). https://www.icao.int/environmental-protection/Carbonoffset/Pages/default.aspx Information on the conversion of train miles into emissions has been obtained from the Spanish railway system (RENFE).

Cooling-associated emissions have been calculated using the official conversion factors from the amount of fluorinated gas used in the recharges of AC systems.

Streamlined Energy and Carbon Reporting continued

Regarding the sustainability of our activity, efforts are devoted to use as much energy obtained from renewable sources as possible. In our manufacturing plant, 4D Pharma León, Spain, 38% of the energy is certified as coming from renewable sources.

Due to the COVID-19 pandemic and associated travel restrictions, emissions for the period associated with travel are reduced compared with estimates from previous years. Even following the expected relaxation of such restrictions, the Group expects to continue to make increased use of remote working and virtual meetings, allowing the Group to continue its reduced travel and associated emissions.

The intensity metric utilised in this first year of emissions and energy reporting is tCO_2e per FTE. The commitment of the Company to improve energy efficiency will be measured by this metric in the comparison with future years.

The intensity metric for 2020 is 3,42 tCO_2e/FTE.

Substantial shareholders

	Number of ordinary shares 0.25 pence each as at 31 December 2020	**% of issued capital**	Number of ordinary shares 0.25 pence each as at 31 December 2019	% of issued capital
Hargreaves Lansdown Asset Management	**16,853,258**	**12.82%**	725,151	1.11%
4D pharma Directors & related holdings	**16,707,731**	**12.71%**	19,991,936	30.53%
South Ocean Capital Management LLC and connected parties	**14,442,698**	**10.99%**	—	0%
Merck & Co./MSD	**7,661,000**	**5.83%**	—	0%
Interactive Investor Trading	**7,495,859**	**5.70%**	348,609	0.53%
Barclays	**6,060,085**	**4.61%**	479,151	0.73%
Mr. Richard Griffiths and controlled undertakings	**5,387,013**	**4.10%**	9,854,533	15.05%
Halifax Share Dealing	**5,129,953**	**3.90%**	172,024	0.26%
Jarvis Investment Management	**4,639,890**	**3.53%**	24,441	0.04%
HSBC	**4,431,189**	**3.37%**	147,249	0.22%
A J Bell Securities	**3,947,699**	**3.00%**	146,549	0.22%

Full details of the Group's and the Company's share capital movements during the year are given in note 21 to the financial statements.

Details of shares under option are provided in note 22 to the financial statements.

Corporate Governance Statement

The Group's statement on corporate governance can be found in the Corporate Governance Report on pages 23 to 25.

Going concern

The Chairman and CEO's Report on pages 7 to 8 outlines the business activities of the Group, along with the factors which may affect its future development and performance, and discusses the Group's financial position, along with details of its cash flow and liquidity. Reference is made to the statement on Principal risks and uncertainties on pages 18 to 22.

The Group and parent company are subject to a number of risks similar to those of other development stage pharmaceutical companies. These risks include, amongst others, generation of revenues in due course from the development portfolio and risks associated with research, development, and obtaining regulatory approvals of its products. Ultimately, the attainment of profitable operations is dependent on future uncertain events which include obtaining adequate financing to fulfil the Group's commercial and development activities and generating a level of revenue to support the Group's cost structure.

The Directors have prepared detailed financial forecasts and cash flows looking beyond 12 months from the date of the approval of these financial statements. In developing these forecasts, the Directors have made assumptions based upon their view of the current and future economic conditions that are expected to prevail over the forecast period. Following completion of the Longevity transaction, the fundraise and the addition of an overdraft facility in Spain, all in March of 2021, the Directors estimate that the cash held by the Group together with known receivables will be sufficient to support the current level of activities into Q2 of 2022. The Directors have therefore prepared the financial statements on a going concern basis.

Disclosure of information to the auditor

The Directors who held office at the date of approval of this Directors' Report confirm that:

so far as they are each aware, there is no relevant audit information of which the Group's auditor is unaware; and

each Director has taken all the steps that he ought to have taken as a Director to make himself aware of any relevant audit information, and to establish that the Group's auditor is aware of that information.

Auditor

RSM UK Audit LLP has indicated its willingness to continue in office. Ordinary resolutions to re-appoint RSM UK Audit LLP as auditor and to authorize the Directors to agree its remuneration will be proposed at the forthcoming Annual General Meeting.

Annual General Meeting

The Annual General Meeting of the Company will be held at 10am (BST) on 24 May 2021 at 9 Bond Court, Leeds, UK, LS1 2JZ

The Directors' Report was approved by the Board on 31 March 2021 and was signed on its behalf by:

Duncan Peyton
Chief Executive Officer
31 March 2021

Corporate governance: Statement of Directors' responsibilities

The Directors are responsible for preparing the Strategic Report, the Directors' Report and the financial statements in accordance with applicable law and regulations.

Company law requires the directors to prepare group and company financial statements for each financial year. The Directors have elected under company law to prepare the group financial statements in accordance with international accounting standards in conformity with the requirements of the Companies Act 2006 and have elected under company law to prepare the Company financial statements in accordance with international accounting standards in conformity with the requirements of the Companies Act 2006 and applicable law.

The Group and Company financial statements are required by law and international accounting standards in conformity with the requirements of the Companies Act 2006 to present fairly the financial position of the Group and the Company and the financial performance of the Group. The Companies Act 2006 provides in relation to such financial statements that references in the relevant part of that Act to financial statements giving a true and fair view are references to their achieving a fair presentation.

Under company law the Directors must not approve the financial statements unless they are satisfied that they give a true and fair view of the state of affairs of the Group and the Company and of the profit or loss of the Group and the Company for that period.

In preparing each of the Group and Company financial statements, the Directors are required to:

a. select suitable accounting policies and then apply them consistently;

b. make judgements and accounting estimates that are reasonable and prudent;

c. state whether they have been prepared in accordance with international accounting standards in conformity with the requirements of the Companies Act 2006; and

d. prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Group and the Company will continue in business.

The Directors are responsible for keeping adequate accounting records that are sufficient to show and explain the Group's and the Company's transactions and disclose with reasonable accuracy at any time the financial position of the Group and the Company and enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the Group and the Company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

The Directors are responsible for the maintenance and integrity of the corporate and financial information included on the 4D pharma plc website.

Legislation in the United Kingdom governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

Independent auditor's report to the members of 4D pharma plc

Opinion

We have audited the financial statements of 4D pharma plc (the 'parent company') and its subsidiaries (the 'group') for the year ended 31 December 2020 which comprise the Group Statement of Total Comprehensive Income, the Group and Parent Company Statement of Financial Position, the Group and Parent Company Statement of Changes in Equity, the Group and Parent Company Cash Flow Statement and notes to the financial statements, including significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and International Accounting Standards in conformity with the requirements of the Companies Act 2006 and, as regards the parent company financial statements, as applied in accordance with the provisions of the Companies Act 2006.

In our opinion:

- the financial statements give a true and fair view of the state of the group's and of the parent company's affairs as at 31 December 2020 and of the group's loss for the year then ended;
- the group financial statements have been properly prepared in accordance with International Accounting Standards in conformity with the requirements of the Companies Act 2006;
- the parent company financial statements have been properly prepared in accordance International Accounting Standards in conformity with the requirements of the Companies Act 2006 and as applied in accordance with the Companies Act 2006; and
- the financial statements have been prepared in accordance with the requirements of the Companies Act 2006.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We are independent of the group and parent company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard as applied to listed entities and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Conclusions relating to going concern

In auditing the financial statements, we have concluded that the directors' use of the going concern basis of accounting in the preparation of the financial statements is appropriate. For an explanation of how we evaluation management's assess of the group's and parent company's ability to continue to adopt the going concern basis of accounting and our key observations arising in respect to that evaluation, please see the going concern key audit matter.

Based on the work we have performed, we have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on the group's or the parent company's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

Our responsibilities and the responsibilities of the directors with respect to going concern are described in the relevant sections of this report.

Summary of our audit approach

Key audit matters	**Group** • Impairment of intangibles • Going concern **Parent Company** • Impairment of intercompany receivables
Materiality	**Group** • Overall materiality: £588,000 (2019: £590,000) • Performance materiality: £441,000 (2019: £442,000) **Parent Company** • Overall materiality: £330,000 (2019: £275,000) • Performance materiality: £247,000 (2019: £206,000)
Scope	Our audit procedures covered 100% of revenue, 100% of expenditure, 100% of total assets and 100% of loss before tax.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the group and parent company financial statements of the current period and include the most significant assessed risks of material misstatement (whether or not due to fraud) we identified, including those which had the greatest effect on the overall audit strategy, the allocation of resources in the audit and directing the efforts of the engagement team. These matters were addressed in the context of our audit of the group and parent company financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key audit matters continued

Impairment of intangibles

Key audit matter description	The Group carries goodwill and other intangibles amounting to £14,025,000 (2019: £13,988,000) in respect of past business combinations and subsequent purchases of intangible assets. As set out in note 12 the recoverability (and timing thereof) of the goodwill and other intangibles arising on these acquisitions is dependent on the cash generating units to which the intangible is allocated generating sufficient cash flows in the future. We considered this to be a key audit matter because of the significant management judgement in forecasting the cash flows and selecting an appropriate discount rate there is a high level of estimation uncertainty which results in there being a significant risk associated with determining whether goodwill and other intangible assets are impaired and useful economic lives remain appropriate.
How the matter was addressed in the audit	We performed work on the Directors' impairment assessment as follows: • Reviewing the underlying models, corroborating the inputs thereto and challenging the judgements and assumptions used by management and the need or otherwise for these to be updated based on new matters arising in their assessment of whether goodwill and other intangible assets had been impaired; • Performing sensitivity analysis on the cash flow model; • Considering whether the models used in the prior year are still appropriate given the developments within the business during the year and the stages of the programme lifecycles; and • Assessing management's sensitivity analysis of key assumptions and how these have been updated, including those in relation to the likelihood of successful product development, timing of sales and associated cash inflows, pricing, and discount rate, and considered whether the disclosures about the sensitivity of the outcome of the impairment assessment to reasonably possible changes in key assumptions were adequate and properly reflected the risks inherent in the assessment of the carrying value of goodwill and other intangibles.

Going concern

Key audit matter description	As an early revenue bioscience Group, the directors are required to raise funding on a periodic basis to allow the company to continue with its research activities and meet its operating cash flow obligations as they fall due. This requirement will continue until such time as the Group is able to generate sufficient cash inflow from other sources such as revenue generation and / or collaboration agreements to meet these needs. In preparing the financial statements on a going concern basis, the Directors are required to confirm that the Group has access to sufficient funding to meet its operating requirements for a period of not less than 12 months from the date of approval of the financial statements. The Board prepare detailed cash flow forecasts based on a number of assumptions to be able to conclude on this matter.
How the matter was addressed in the audit	We undertook work on the cash flow forecasts prepared by management as follows: • Agreeing the mechanical accuracy of the forecasts to ensure that they were a suitable basis for concluding; • Obtaining and reviewing evidence to support the key assumptions on cash inflows included therein, including consideration of share issues, revenue and collaboration agreements and other such cash generating items; • Challenging management on the assumptions used and the timing of cashflows; • Subjecting the forecasts to a number of sensitivities to stress test these for the amount of available headroom; • Reviewing the disclosures made by the Directors as to the basis of preparation of the financial statements.

Key audit matters continued

Impairment of intercompany receivables

Key audit matter description	At 31 December 2020 the parent company balance sheet includes gross amounts owed by subsidiary undertakings of £74,078,000 (2019: £59,820,000). The risk is that this balance may not be recoverable owing to the ongoing losses sustained in the group's subsidiary undertakings. The recoverability of these balances is judgemental, and the Directors have provided us with their assessment of recoverability through multiple scenarios, including the present value of future cashflows, the saleable value of liquid assets, and also through assessing the value of the group (including assessment of the current market capitalisation). A cumulative provision of £1,408,000 (2019: £177,000) has been recognised against the receivable from 4D Pharma Cork Limited. No other intercompany receivables were impaired.
How the matter was addressed in the audit	We identified amounts due from each subsidiary undertaking and discussed with management whether each balance is recoverable taking into account the strategic plans established by the Board in respect of each subsidiary undertaking. We also obtained management's impairment reviews and underlying calculations prepared to support the carrying value of the financial assets. We performed work on the Directors assessment as follows: • Reviewing forecasts, and challenging the assumptions and inputs used in determining the present value of future cashflows, including the likelihood of successful product development, timing of sales, pricing, and discount rate; • Considering the sensitivity of key assumptions in relation to the recoverability of saleable assets; • Challenging management on their assessment of the valuation of the group including their consideration of recent transactions involving similar type businesses; and • Ensuring adequate disclosure in the notes to the financial statements.

Our application of materiality

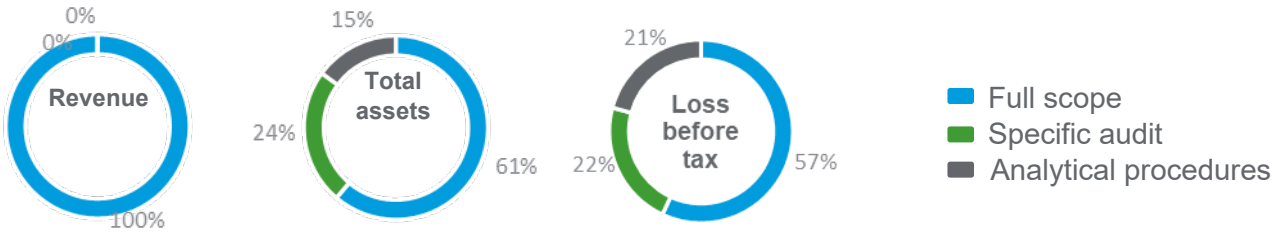
When establishing our overall audit strategy, we set certain thresholds which help us to determine the nature, timing and extent of our audit procedures. When evaluating whether the effects of misstatements, both individually and on the financial statements as a whole, could reasonably influence the economic decisions of the users we take into account the qualitative nature and the size of the misstatements. Based on our professional judgement, we determined materiality as follows:

	Group	Parent company
Overall materiality	£588,000 (2019: £590,000)	£330,000 (2019: £275,000)
Basis for determining overall materiality	2% of total expenditure, excluding one off costs in relation to the ongoing US transaction	2% of total expenditure, excluding one off costs in relation to the ongoing US transaction and impairment of the 4D Pharma Cork Limited debtor
Rationale for benchmark applied	The Group is an early revenue bioscience business and continues to apply the funds it has raised in the application of scientific research – these costs are expensed as incurred so users of the financial statements will consider the application of the funds as the relevant measure. Material costs incurred that are not a direct function of this activity have been excluded to provide a consistent benchmark.	
Performance materiality	£441,000 (2019: £442,000)	£247,000 (2019: £206,000)
Basis for determining performance materiality	75% of overall materiality	75% of overall materiality
Reporting of misstatements to the Audit Committee	Misstatements in excess of £27,400 and misstatements below that threshold that, in our view, warranted reporting on qualitative grounds.	Misstatements in excess of £16,500 and misstatements below that threshold that, in our view, warranted reporting on qualitative grounds.

An overview of the scope of our audit

The group consists of 6 components, located in the following countries: United Kingdom, Republic of Ireland, Spain, United States of America, British Virgin Islands.

The coverage achieved by our audit procedures was:



Full scope audits were performed for 2 components, specific audit procedures for 2 components and analytical procedures at group level for the remaining 2 components.

Specific audit procedures were performed in respect of the components located in Spain and the Republic of Ireland, targeted to address the risk of material misstatement in the consolidated financial statements. These included specific procedures to address the Key Audit Matters identified as part of the Group audit. Analytical procedures were performed in respect of the United States of America and British Virgin Isles components which have not to date undertaken significant activity.

Other information

The other information comprises the information included in the annual report, other than the financial statements and our auditor's report thereon. The directors are responsible for the other information contained within the annual report. Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

Our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the course of the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether this gives rise to a material misstatement in the financial statements themselves. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

We have nothing to report in this regard.

Opinions on other matters prescribed by the Companies Act 2006

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the Strategic Report and the Directors' Report for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- the Strategic Report and the Directors' Report have been prepared in accordance with applicable legal requirements.

Matters on which we are required to report by exception

In the light of the knowledge and understanding of the group and the parent company and their environment obtained in the course of the audit, we have not identified material misstatements in the Strategic Report or the Directors' Report.

We have nothing to report in respect of the following matters in relation to which the Companies Act 2006 requires us to report to you if, in our opinion:

- adequate accounting records have not been kept by the parent company, or returns adequate for our audit have not been received from branches not visited by us; or
- the parent company financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of directors' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit.

Responsibilities of directors

As explained more fully in the directors' responsibilities statement set out on page 34, the directors are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the directors determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the directors are responsible for assessing the group's and the parent company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the group or the parent company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

The extent to which the audit was considered capable of detecting irregularities, including fraud

Irregularities are instances of non-compliance with laws and regulations. The objectives of our audit are to obtain sufficient appropriate audit evidence regarding compliance with laws and regulations that have a direct effect on the determination of material amounts and disclosures in the financial statements, to perform audit procedures to help identify instances of non-compliance with other laws and regulations that may have a material effect on the financial statements, and to respond appropriately to identified or suspected non-compliance with laws and regulations identified during the audit.

In relation to fraud, the objectives of our audit are to identify and assess the risk of material misstatement of the financial statements due to fraud, to obtain sufficient appropriate audit evidence regarding the assessed risks of material misstatement due to fraud through designing and implementing appropriate responses and to respond appropriately to fraud or suspected fraud identified during the audit.

However, it is the primary responsibility of management, with the oversight of those charged with governance, to ensure that the entity's operations are conducted in accordance with the provisions of laws and regulations and for the prevention and detection of fraud.

In identifying and assessing risks of material misstatement in respect of irregularities, including fraud, the group audit engagement team:

- obtained an understanding of the nature of the industry and sector, including the legal and regulatory frameworks that the group and parent company operate in and how the group and parent company are complying with the legal and regulatory frameworks;
- inquired of management, and those charged with governance, about their own identification and assessment of the risks of irregularities, including any known actual, suspected or alleged instances of fraud;
- discussed matters about non-compliance with laws and regulations and how fraud might occur including assessment of how and where the financial statements may be susceptible to fraud.

The most significant laws and regulations were determined as follows:

Legislation / Regulation	Additional audit procedures performed by the audit engagement team included:
IFRS and Companies Act 2006	Review of the financial statement disclosures and testing to supporting documentation Completion of disclosure checklists to identify areas of non-compliance
Tax compliance regulations	Inspection of advice / input received from external tax advisors with regards to the Research & Development Tax Credit Scheme Input from a tax specialist was obtained regarding the tax impact of the Research & Development Tax Credit scheme under which the Group makes significant claims with regards to costs / losses incurred on research expenditure
Patent maintenance and compliance	Inspection of documentation to support the patents held and the ongoing maintenance of thereof
Good laboratory practice	Enquiry of the Directors and other management, and inspection of regulatory and legal correspondence

The areas that we identified as being susceptible to material misstatement due to fraud were:

Risk	Audit procedures performed by the audit engagement team:
Management override of controls	Testing the appropriateness of journal entries and other adjustments; Assessing whether the judgements made in making accounting estimates are indicative of a potential bias; and Evaluating the business rationale of any significant transactions that are unusual or outside the normal course of business.

A further description of our responsibilities for the audit of the financial statements is located on the Financial Reporting Council's website at: http://www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Use of our report

This report is made solely to the company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the company and the company's members as a body, for our audit work, for this report, or for the opinions we have formed.

Andrew Allchin FCA (Senior Statutory Auditor)
For and on behalf of RSM UK Audit LLP, Statutory Auditor
Chartered Accountants
Central Square,
5th Floor
29 Wellington Street
Leeds
LS1 4DL
31 March 2021

Group statement of total comprehensive income

For the year ended 31 December 2020

	Notes	**31 December 2020 £000**	31 December 2019 £000
Revenue	4	**534**	211
Research and development costs	5	**(22,041)**	(26,512)
Administrative expenses	5	**(9,079)**	(4,359)
Foreign currency gains / (losses)	5	**363**	(1,006)
Other income	5	**45**	34
Operating loss before non-recurring items		**(30,178)**	(31,632)
Non-recurring items	6	**—**	2,659
Operating loss after non-recurring items		**(30,178)**	(28,973)
Finance income	8	**5**	61
Finance expense	8	**(173)**	(514)
Loss before taxation		**(30,346)**	(29,426)
Taxation	9	**4,383**	5,360
Loss for the year		**(25,963)**	(24,066)
Other comprehensive income:			
Exchange differences on translating foreign operations		**110**	379
Loss for the year and total comprehensive income for the year		**(25,853)**	(23,687)
Loss per share			
Basic and diluted for the year	10	**(22.80)p**	(36.75)p

The basic and diluted loss per share are the same as the effect of share options is anti-dilutive.

The notes on pages 48 to 84 form an integral part of these financial statements.

Group statement of financial position

At 31 December 2020

Registered no. 08840579

	Notes	At 31 December 2020 £000	At 31 December 2019 £000
Assets			
Non-current assets			
Property, plant and equipment			
- Owned assets	11	**3,659**	4,196
- Right-of-use assets	11	**835**	964
Intangible assets	12	**14,025**	13,988
Taxation receivables	16	**177**	188
		18,696	19,336
Current assets			
Inventories	14	**291**	198
Trade and other receivables	15	**3,223**	1,118
Taxation receivables	16	**4,436**	6,122
Cash and cash equivalents	17	**8,775**	3,836
		16,725	11,274
Total assets		**35,421**	30,610
Liabilities			
Current liabilities			
Trade and other payables	18	**6,379**	6,192
Lease liabilities	19	**73**	68
		6,452	6,260
Non-current liabilities			
Lease liabilities	19	**986**	1,043
Deferred tax	20	**13**	964
		999	2,007
Total liabilities		**7,451**	8,267
Net assets		**27,970**	22,343
Capital and reserves			
Share capital	21	**329**	164
Share premium account	21	**136,278**	108,296
Merger reserve		**958**	958
Translation reserve		**555**	446
Other reserve		**(864)**	(864)
Share-based payments reserve	22	**3,497**	367
Retained earnings		**(112,783)**	(87,024)
Total equity		**27,970**	22,343

Approved by the Board and authorised for issue on 31 March 2021.

The notes on pages 48 to 84 form an integral part of these financial statements.

Duncan Peyton
Director
31 March 2021

Company statement of financial position

At 31 December 2020

Registered no. 08840579

	Notes	At 31 December 2020 £000	At 31 December 2019 £000
Assets			
Non-current assets			
Property, plant and equipment			
- Owned assets	11	**189**	312
- Right-of-use assets	11	**569**	663
Intangible assets	12	**119**	373
Investment in subsidiaries	13	**11,713**	11,703
		12,590	13,051
Current assets			
Loans to subsidiaries	13	**72,670**	59,643
Trade and other receivables	15	**1,910**	371
Taxation receivables	16	**1,551**	1,991
Cash and cash equivalents	17	**6,213**	2,921
		82,344	64,926
Total assets		**94,934**	77,977
Liabilities			
Current liabilities			
Trade and other payables	18	**3,575**	1,840
Lease liabilities	19	**37**	32
		3,612	1,872
Non-current liabilities			
Lease liabilities	19	**716**	754
		716	754
Total liabilities		**4,328**	2,626
Net assets		**90,606**	75,351
Capital and reserves			
Share capital	21	**329**	164
Share premium account	21	**136,278**	108,296
Merger reserve		**958**	958
Share-based payments reserve	22	**3,497**	367
Retained earnings		**(50,456)**	(34,434)
Total equity		**90,606**	75,351

The Company has elected to take the exemptions under s408 of the Companies Act 2006 not to present the parent company's Statement of Comprehensive Income. The Company's loss for the year was £16.13 million (31 December 2019: £9.89 million).

Approved by the Board and authorised for issue on 31 March 2021.

The notes on pages 48 to 84 form an integral part of these financial statements.

Duncan Peyton
Director
31 March 2021

Group statement of changes in equity

For the year ended 31 December 2020

	Share capital £000	Share premium £000	Merger reserve £000	Translation reserve £000	Other reserve £000	Share-based payment reserve £000	Retained Earnings £000	Total equity £000
At 1 January 2019	164	108,296	958	67	(864)	708	(63,566)	45,763
Issue of share capital (net of expenses)	—	—	—	—	—	—	—	—
Total transactions with owners recognised in equity for the year	—	—	—	—	—	—	—	—
Loss and total comprehensive income for the year	—	—	—	379	—	—	(24,066)	(23,687)
Lapsed options	—	—	—	—	—	(608)	608	—
Issue of share-based compensation	—	—	—	—	—	267	—	267
At 31 December 2019	164	108,296	958	446	(864)	367	(87,024)	22,343
Issue of share capital (net of expenses)	165	27,906	—	—	—	—	—	28,071
Issue of Warrants (net of expenses)	—	—	—	—	—	3,110	—	3,110
Exercise of Warrants	—	76	—	—	—	(11)	—	65
Total transactions with owners recognised in equity for the year	165	27,982	—	—	—	3,099	—	31,246
Loss and total comprehensive income for the year	—	—	—	109	—	—	(25,963)	(25,854)
Lapsed options	—	—	—	—	—	(204)	204	—
Issue of share-based compensation	—	—	—	—	—	235	—	235
At 31 December 2020	**329**	**136,278**	**958**	**555**	**(864)**	**3,497**	**(112,783)**	**27,970**

Details regarding the purpose of each reserve within equity are given in note 23.

Company statement of changes in equity

For the year ended 31 December 2020

	Share capital £000	Share premium £000	Merger reserve £000	Share-based payment reserve £000	Retained earnings £000	Total £000
At 1 January 2019	164	108,296	958	708	(24,920)	85,206
Issue of share capital (net of expenses)	—	—	—	—	—	—
Total transactions with owners recognised in equity for the year	—	—	—	—	—	—
Loss and total comprehensive income for the year	—	—	—	—	(9,889)	(9,889)
Lapsed options	—	—	—	(375)	375	—
Lapsed options relating to investment in group companies	—	—	—	(103)	—	(103)
Issue of share-based compensation	—	—	—	137	—	137
At 31 December 2019	164	108,296	958	367	(34,434)	75,351
Issue of share capital (net of expenses)	165	27,906	—	—	—	28,071
Issue of Warrants (net of expenses)	—	—	—	3,110	—	3,110
Exercise of Warrants	—	76	—	(11)	—	65
Total transactions with owners recognised in equity for the year	165	27,982	—	3,099	—	31,246
Loss and total comprehensive income for the year	—	—	—	—	(16,128)	(16,128)
Lapsed options	—	—	—	(106)	106	—
Issue of options relating to investment in group companies	—	—	—	10	—	10
Issue of share-based compensation	—	—	—	127	—	127
At 31 December 2020	**329**	**136,278**	**958**	**3,497**	**(50,456)**	**90,606**

Details regarding the purpose of each reserve within equity are given in note 23.

Group cash flow statement

For the year ended 31 December 2020

	Notes	**Year to 31 December 2020 £000**	Year to 31 December 2019 £000
Loss after taxation		**(25,963)**	(24,066)
Adjustments for:			
Depreciation of property, plant and equipment	11	**1,003**	1,065
Amortisation of intangible assets	12	**203**	216
Profit on disposal of property, plant and equipment		**—**	(17)
Loss on disposal of intangible assets		**—**	29
Lease liabilities included in the Income statement		**135**	159
Finance income	8	**(5)**	(61)
Finance expense	8	**173**	514
Release of contingent consideration	6	**—**	(2,659)
Share-based compensation	22	**3,334**	267
Cash flows from operations before movements in working capital		**(21,120)**	(24,553)
Changes in working capital:			
(Increase)/decrease in inventories		**(93)**	92
(Increase)/decrease in trade and other receivables		**(2,105)**	130
Decrease/(increase) in taxation receivables		**1,697**	(780)
(Decrease)/increase in trade and other payables		**(1,052)**	3,555
Cash outflow from operating activities		**(22,673)**	(21,556)
Cash flows from investing activities			
Purchases of property, plant and equipment	11	**(163)**	(538)
Purchase of software and other intangibles	12	**(15)**	(57)
Cash received on disposal of assets		**—**	43
Monies drawn from deposit		**—**	10,174
Net cash (outflow)/inflow from investing activities		**(178)**	9,622
Cash flows from financing activities			
Proceeds from issues of ordinary share capital	21	**29,740**	—
Expenses on issue of shares	21	**(1,594)**	—
Lease liability payments		**(188)**	(197)
Interest received	8	**5**	94
Interest paid	8	**(173)**	(180)
Net cash inflow/(outflow) from financing activities		**27,790**	(283)
Increase/(decrease) in cash and cash equivalents		**4,939**	(12,217)
Cash and cash equivalents at the start of the year		**3,836**	16,053
Cash and cash equivalents at the end of the year	17	**8,775**	3,836

Company cash flow statement

For the year ended 31 December 2020

	Notes	**Year to 31 December 2020 £000**	Year to 31 December 2019 £000
Loss after taxation		**(16,128)**	(9,889)
Adjustments for:			
Depreciation of property, plant and equipment	11	**221**	248
Amortisation of intangible assets	12	**263**	268
Profit on disposal of property, plant and equipment		**—**	(17)
Loss on disposal of intangible assets		**—**	1
Lease liabilities included in the Income statement		**2**	2
Finance income	8	**(5)**	(61)
Finance expense		**123**	462
Impairment of Inter-company loans	13	**1,230**	**177**
Release of contingent consideration	6	**—**	(2,659)
Share-based compensation	22	**3,226**	137
Cash flows from operations before movements in working capital		**(11,068)**	(11,331)
Changes in working capital:			
Increase in trade and other receivables		**(1,539)**	(10)
Decrease/(increase) in taxation receivables		**440**	(766)
Increase in trade and other payables		**1,735**	655
Cash outflow from operating activities		**(10,432)**	(11,452)
Cash flows from investing activities			
Purchases of property, plant and equipment	11	**(4)**	(29)
Purchase of software and other intangibles	12	**(9)**	(57)
Cash received on disposal of assets		**—**	43
Loans to subsidiary undertakings	13	**(14,257)**	(9,170)
Monies (placed on)/drawn from deposit		**—**	10,174
Net cash (outflow)/inflow from investing activities		**(14,270)**	961
Cash flows from financing activities			
Proceeds from issues of ordinary share capital	21	**29,740**	—
Expenses on issue of shares	21	**(1,594)**	—
Lease liability payments		**(34)**	(30)
Interest received	8	**5**	94
Interest paid		**(123)**	(127)
Net cash inflow/(outflow) from financing activities		**27,994**	(63)
Increase/(decrease) in cash and cash equivalents		**3,292**	(10,554)
Cash and cash equivalents at the start of the year		**2,921**	13,475
Cash and cash equivalents at the end of the year	17	**6,213**	2,921

1. General information

4D pharma plc (the "Company") is an AIM-quoted company incorporated and domiciled in the UK. The locations and principal activities of the subsidiaries are set out in note 13. The Company is incorporated in England and Wales. The registered office is Fifth Floor, 9 Bond Court, Leeds LS1 2JZ. These Group financial statements consolidate those of the Company and its subsidiaries (together referred to as the "Group" and individually as "Group entities") for the year ended 31 December 2020.

The financial statements of 4D pharma plc and its subsidiaries for the year ended 31 December 2020 were authorised for issue by the Board of Directors on 31 March 2021 and the Statements of financial position was signed on the Board's behalf by Duncan Peyton.

The Company has elected to take the exemption under section 408 of the Companies Act 2006 not to present the parent company's Statement of Comprehensive Income.

The significant accounting policies adopted by the Group are set out in note 3.

2. Basis of preparation

(a) Statement of compliance

Under the current transitional arrangement to UK IFRS, the Group's financial statements have been prepared in accordance with International Financial Reporting Standards as adopted by the European Union ("IFRS") and IFRS Interpretations Committee ("IFRSIC") interpretations as they apply to the financial statements of the Group for the year ended 31 December 2020 and the requirements of the Companies Act 2006 applicable to companies reporting under IFRS.

Further details of the transitional arrangements can be found in the significant accounting policies in note 3(u).

(b) Basis of measurement

The parent company and Group financial statements have been prepared on the historical cost basis except for the methods used to measure fair values of assets and liabilities, which are discussed in the respective notes and in note 3.

(c) Going concern

The Chairman and Chief Executive Officer's Review on pages 7 to 8 outlines the business activities of the Group along with the factors which may affect its future development and performance. The Group's financial position is discussed in the Financial Review on pages 13 to 17 along with details of its cash flow and liquidity. Note 25 to the financial statements sets out the Group's financial risks and the management of those risks.

The Group and parent company are subject to a number of risks similar to those of other development stage pharmaceutical companies. These risks include, amongst others, generation of revenues in due course from the development portfolio and risks associated with research, development and obtaining regulatory approvals of its products. Ultimately, the attainment of profitable operations is dependent on future uncertain events which include obtaining adequate financing to fulfil the Group's commercial and development activities and generating a level of revenue to support the Group's cost structure.

The Directors have prepared detailed financial forecasts and cash flows looking beyond twelve months from the date of the approval of these financial statements. In developing these forecasts, the Directors have made assumptions based upon their view of the current and future economic conditions that are expected to prevail over the forecast period. Shortly after the year-end the Company completed the Merger with Longevity Acquisition Corporation (Longevity) through the issue of new ordinary shares. On completion cash in hand for Longevity was $14.8 million which is expected to add approximately £8.3 million ($11.6 million) in cash to the Company after the payment of costs and settlement of liabilities. A further 4,320,000 warrants convertible to Ordinary shares were also issued as part of the transaction which, if exercised in full, would add approximately $29.0 million in cash to the Company. Concurrently with the completion of the Longevity transaction the Company issued new Ordinary shares in a private placement which raised £18.0 million ($25.0 million) in gross proceeds with certain Directors intending to subscribe for a further £1.44 million ($2.0 million) following release of the company results for the year ended 31 December 2020. Also, in March 2021 our Spanish Subsidiary received a €1.0 million (£0.86 million) overdraft facility as part of the Spanish COVID-19 relief package. The overdraft is unsecured, incurs annual interest at a rate of 2.35% and is repayable at the end of the three-year term. Given the additional funding from the items above, but excluding both the possible redemption the Company warrants issues during the February 2020 share issue (currently worth around £21.9 million) and the warrants issued as part of the Longevity transaction, the Directors estimate that the Group will have sufficient cash to fund its operations into Q2 of 2022 and have prepared the financial statements accordingly using a going concern basis.

(d) Functional and presentational currency

These financial statements are presented in Pounds Sterling, which is the Group's functional currency. Unless otherwise stated, all financial information presented has been rounded to the nearest thousand.

(e) Use of estimates and judgements

The preparation of financial statements requires management to make estimates and judgements that affect the amounts reported for assets and liabilities as at the reporting date and the amounts reported for revenues and expenses during the year. The nature of estimation means that actual amounts could differ from those estimates. Estimates and judgements used in the preparation of the financial statements are continually reviewed and revised as necessary. While every effort is made to ensure that such estimates and judgements are reasonable, by their nature they are uncertain and, as such, changes in estimates and judgements may have a material impact on the financial statements.

The key sources of estimation uncertainty and critical accounting policies that have a significant risk of causing material adjustment to the carrying amount of assets and liabilities within the next financial year are discussed below:

(i) Taxation

Management judgement is required to determine the amount of tax assets that can be recognised, based upon the likely timing and level of future taxable profits together with an assessment of the effect of future tax planning strategies. The carrying value of the unrecognised tax losses on 31 December 2020 was £66.6 million. The value of the additional deferred tax asset not recognised at the year-end is £12.6 million. Further information is included in note 9.

2. Basis of preparation continued

(e) Use of estimates and judgements continued

(ii) Research and development

Careful judgement by the Directors is applied when deciding whether the recognition requirements for development costs have been met. This is necessary as the economic success of any product development is uncertain until such time as technical viability has been proven and commercial supply agreements are likely to be achieved. Judgements are based on the information available at each reporting date which includes the progress with testing and certification and progress on, for example, establishment of commercial arrangements with third parties. In addition, all internal activities related to research and development of new products are continuously monitored by the Directors. Further information is included in note 3.

(iii) Intangible fixed assets and goodwill

Estimated impairment of intangible fixed assets and goodwill

The Group tests annually whether intangible fixed assets and goodwill have suffered any impairment, in accordance with the accounting policy stated in note 3. The potential recoverable amounts of intangible fixed assets and goodwill have been determined based on value in use calculations. These calculations require the use of estimates both in arriving at the expected future cash flows and the application of a suitable discount rate in order to calculate the present value of these flows. There is a degree of judgement involved in making assessments of attributable values on acquisition and making impairment assessments. More detail is provided in note 3(i).

(iv) Prepaid share purchase costs

Prior to the year end, the Group had committed to undertake a merger with Longevity Acquisition Corp (NASDAQ: LOAC), a Special Purpose Acquisition Company (SPAC). As SPAC's are in effect a cash shell which has no specified business, the judgement of the Directors at the year-end was that the transaction is equivalent to the issue of shares for a consideration and should be treated in the same way as other capital raises. At the year-end, fundraising costs associated with the transaction have been prepaid as completion of the transaction would see them included in the share premium account; had the transaction failed to be complete then these would have been expensed to the Income Statement.

(v) Inter-company balances

The Company uses judgement when considering the recoverability of its inter-company balances and any impairment associated with them. Thought there is no evidence of impairment of the underlying asset, after careful consideration the Group have included an impairment in respect of certain inter-company balances based on the reduced level of activity in certain areas, further detail is included in note 13.

(vi) Deferred tax

The Group reviews its assumptions and estimation techniques in respect to assets and liabilities on an annual basis including assumptions around the liability and associated recoverability of deferred tax assets. Management have always held the view that the Group and assets will be profitable before any sale of the asset is considered and that the Group should not offset such deferred tax liabilities arising on the purchase of these assets against deferred tax assets as a result. Given the recent restructure and reduction in capacity of certain parts of the business we have reviewed this position and believe that this assumption is no longer certain and that it would be more appropriate to only recognise these liabilities should our losses to date become unavailable through utilisation or change in tax regime. As a result, we have offset our brought forwards deferred tax liabilities on acquisition of subsidiaries against available assets until such time as our losses are no longer available to offset, this resulted in a Deferred tax credit recognised in the year of £940,000.

3. Significant accounting policies

The accounting policies set out below are applied consistently by Group entities.

The Group financial statements are presented in Sterling and all values are rounded to the nearest thousand pounds except where otherwise indicated.

(a) Basis of consolidation

(i) Business combinations

Business combinations are accounted for using the acquisition method as at the acquisition date – i.e. when control is transferred to the Group. Control is the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities. In assessing control, the Group takes into consideration potential voting rights that are currently exercisable. The Group measures goodwill at the acquisition date as:

- the fair value of the consideration transferred; plus
- the recognised amount of any non-controlling interests in the acquiree; plus
- if the business combination is achieved in stages, the fair value of the pre-existing equity interest in the acquiree; less
- the net recognised amount (generally fair value) of the identifiable assets acquired and liabilities assumed.

Transaction costs, other than those associated with the issue of debt or equity securities, that the Group incurs in connection with a business combination are expensed as incurred.

(ii) Non-controlling interests

For each business combination, the Group elects to measure any non-controlling interests in the acquiree either:

- at fair value; or
- at their proportionate share of the acquiree's identifiable net assets, which are generally at fair value.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as transactions with owners in their capacity as owners. Adjustments to non-controlling interests are based on a proportionate amount of the net assets of the subsidiary. No adjustments are made to goodwill and no gain or loss is recognised in profit or loss.

3. Significant accounting policies continued

(a) Basis of consolidation continued

(iii) Subsidiaries

Subsidiaries are entities controlled by the Group. The financial statements of subsidiaries are included in the consolidated financial statements from the date that control commences until the date that control ceases.

(iv) Investments in associates

Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. Significant influence is presumed to exist when the Group holds between 20% and 50% of the voting power of another entity.

Investments in associates are accounted for under the equity method and are recognised initially at cost. The cost of the investment includes transaction costs.

The consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity-accounted investees, after adjustments to align the accounting policies with those of the Group, from the date that significant influence or joint control commences until the date that significant influence or joint control ceases.

When the Group's share of losses exceeds its interest in an equity-accounted investee, the carrying amount of the investment, including any long-term interests that form part thereof, is reduced to zero, and the recognition of further losses is discontinued except to the extent that the Group has an obligation or has made payments on behalf of the investee.

(v) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealised income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. Unrealised gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment.

(b) Foreign currency transactions

Transactions in foreign currencies are initially recorded in the functional currency by applying the spot rate ruling at the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency rate of exchange ruling at the reporting date. All differences are recognised in profit or loss.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates as at the dates of the initial transactions. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined.

(c) Segmental reporting

An operating segment is a component of an entity that engages in business activities from which it may earn revenues and incur expenses, whose operating results are regularly reviewed by the Group's chief operating decision maker, being the Chief Executive Officer, to make decisions about resources to be allocated to the segment and assess its performance, and for which discrete financial information is available. As at the reporting date the Group operated as a single segment.

(d) Revenue recognition

Revenue from the sale of goods is measured at the fair value of the consideration and excludes intra-group sales and value added and similar taxes. The primary performance obligation is the transfer of goods to the customer. Revenue from the sale of goods is recognised when control of the goods is transferred to the customer, at an amount that reflects the consideration to which an entity expects to be entitled in exchange for those goods.

The Company has a licensing and development agreement with Merck Sharpe & Dohme Corp. (MSD) for the development of novel vaccines. The terms of the agreement contain multiple elements and deliverables, which may include: (i) upfront fees; (ii) milestone payment; (III) option exercise fees; and, (iv) tiered royalties based on net sales of licenced product. Payments to the Group under the agreement, includes upfront fees, payments for research activities, payments based upon the achievement of certain milestones and royalties on product sales. There are no performance, cancellation, termination, or refund provisions though commercially reasonable efforts are required in the arrangement. The Group follow the provisions of IFRS 15 in accounting for these agreements and recognise income as a function of both labour and materials costs over the anticipated life of the revenue generating element.

(e) Finance income and finance expense

Finance income comprises interest income on funds invested and changes in the fair value of financial assets at fair value through profit or loss. Interest income is recognised as interest accrues using the effective interest rate method.

Finance expense comprises interest expense on borrowings, changes in the fair value of financial assets at fair value through the Group Statement of Comprehensive Income, impairment losses recognised on financial assets and losses on hedging instruments that are recognised in profit or loss. All borrowing costs are recognised using the effective interest method.

3. Significant accounting policies continued

(f) Income tax

Income tax expense comprises current and deferred tax. Income tax expense is recognised in the Group Statement of Total Comprehensive Income except to the extent that it relates to items recognised directly in equity or in other comprehensive income.

Current income tax assets and liabilities for the current and prior years are measured at the amount expected to be recovered from, or paid to, the tax authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted by the reporting date.

Deferred income tax is recognised on all temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the financial statements with the following exceptions:

- where the temporary difference arises from the initial recognition of goodwill or of an asset or liability in a transaction that is not a business combination and that at the time of the transaction affects neither accounting nor taxable profit or loss; and
- in respect of taxable temporary differences associated with investments in subsidiaries where the timing of the reversal of the temporary differences can be controlled and it is probable that the temporary differences will not reverse in the foreseeable future.

Deferred income tax assets and liabilities are measured on an undiscounted basis using the tax rates and tax laws that have been enacted or substantially enacted by the date and which are expected to apply when the related deferred tax asset is realised, or the deferred tax liability is settled.

Deferred income tax assets are recognised to the extent that it is probable that future taxable profits will be available against which differences can be utilised. An asset is not recognised to the extent that the transfer or economic benefits in the future is uncertain.

(g) Recognition of financial instruments

Financial assets and financial liabilities are recognised when the Company becomes party to the contractual provisions of the instrument. The Group determines the classification of its financial assets and liabilities at initial recognition and re-evaluates this designation at each financial year end.

(h) Property, plant and equipment

Property, plant and equipment are recognised initially at cost. After initial recognition, these assets are carried at cost less any accumulated depreciation and any accumulated impairment losses. Cost comprises the aggregate amount paid and the fair value of any other consideration given to acquire the asset and includes costs directly attributable to making the asset capable of operating as intended.

Initial and subsequent measurement of the right-of-use asset

A right-of-use asset is recognised at commencement of the lease and initially measured at the amount of the lease liability, plus any incremental costs of obtaining the lease and any lease payments made at or before the leased asset is available for use by the group. They are subsequently measured at cost less accumulated depreciation and any accumulated impairment losses.

Depreciation is computed by allocating the depreciable amount of an asset on a systematic basis over its useful life and is applied separately to each identifiable component.

The following bases and rates are used to depreciate classes of assets, including right-of use assets:

- Plant and machinery – straight line over three to ten years
- Fixtures, fittings and office equipment – straight line over four to five years
- Land and buildings – straight line over the period of the lease or over five to ten years for shorter life components

The carrying values of property, plant and equipment are reviewed for impairment if events or changes in circumstances indicate that the carrying value may not be recoverable and are written down immediately to their recoverable amount. Useful lives and residual values are reviewed annually and where adjustments are required these are made prospectively.

A property, plant and equipment item is de-recognised on disposal or when no future economic benefits are expected to arise from the continued use of the asset. Any gain or loss arising on the de-recognition of the asset is included in the Income Statement in the year of de-recognition.

(i) Intangible assets

Intellectual property and patents

The carrying value of intangible fixed assets is reviewed annually for impairment whenever events or changes in circumstances indicate the carrying value may not be recoverable.

At each reporting date the Group reviews the carrying value of its intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss.

Where the asset does not generate cash flows that are independent from other assets, the Group estimates the recoverable amount of the cash-generating unit to which the asset belongs. A cash-generating unit is the smallest identifiable group of assets that generates cash inflows from other assets or group assets.

Recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset, for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset is estimated to be less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. An impairment loss is recognised as an expense immediately.

3. Significant accounting policies continued

(i) Intangible assets continued

Intellectual property and patents continued

Where an impairment loss subsequently reverses, the carrying amount of the assets is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior years. A reversal of an impairment loss is recognised in profit or loss immediately.

Amortisation is provided on the fair value of the asset and is calculated on a straight-line basis over its useful life. Amortisation is recognised within the Group Statement of Comprehensive Income. Intellectual property and patents acquired as part of a business combination are only amortised once technical viability has been proven and commercial agreements are likely to be achieved.

Patents includes the costs associated with acquiring and registering patents in respect of intellectual property rights. Patents are amortised on a straight-line basis over their useful lives of up to 20 years from the date of filing the patent.

Goodwill

Goodwill on acquisitions, being the excess of the fair value of the cost of acquisition over the Group's interest in the fair value of the identifiable assets and liabilities acquired, is capitalised and tested for impairment on an annual basis.

Any impairment is recognised immediately in profit or loss and is not subsequently reversed. For the purpose of impairment testing, goodwill is allocated to cash generating units of 4D pharma plc, which represent the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets.

Software

Software is recognised initially at cost. After initial recognition, these assets are carried at cost less any accumulated amortisation and any accumulated impairment losses. Cost comprises the aggregate amount paid and the fair value of any other consideration given to acquire the asset and includes costs directly attributable to making the asset capable of operating as intended.

Amortisation is computed by allocating the amortisation amount of an asset on a systematic basis over its useful life and is applied separately to each identifiable component. Amortisation is applied to software over three to five years on a straight-line basis.

The carrying value of software is reviewed for impairment if events or changes in circumstances indicate that the carrying value may not be recoverable and is written down immediately to their recoverable amount. Useful lives and residual values are reviewed annually and where adjustments are required these are made prospectively.

A software item is de-recognised on disposal or when no future economic benefits are expected to arise from the continued use of the asset. Any gain or loss arising on the de-recognition of the asset is included in the Income Statement in the year of de-recognition.

Internally generated intangible assets

Expenditure on research activities is recognised in the Group Statement of Comprehensive Income as incurred. Expenditure arising from the Group's development is recognised in the Statement of Financial Position only if all of the following conditions are met:

- an asset is created that can be identified in the Group Statement of Financial Position;
- it is probable that the asset created will generate future economic benefits;
- the development cost of the asset can be measured reliably;
- the Group has the intention to complete the asset and the ability and intention to use or sell it;
- the product or process is technically and commercially feasible; and
- sufficient resources are available to complete the development and to either sell or use the asset.

Where these criteria have not been achieved, development expenditure is recognised in profit or loss in the year in which it is incurred.

The Group has adopted the industry standard approach to the treatment of development expenditure by capitalising development costs at the point where regulatory approval is reached and the probability of generating future economic benefits is high.

(j) Impairment of assets

An asset's recoverable amount is the higher of an assets or cash-generating unit's fair value less costs to sell and its value in use and is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. Where the carrying value of an asset exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. In determining fair value less costs of disposal, an appropriate valuation model is used; these calculations are corroborated by valuation multiples, or other available fair value indicators. Impairment losses on continuing operations are recognised in the Group Statement of Comprehensive Income in those expense categories consistent with the function of the impaired asset.

(k) Investments in subsidiaries

Investments in and loans to subsidiaries are stated in the Company's Statement of Financial Position at cost less provision for any impairment.

3. Significant accounting policies continued

(l) Impairment of financial assets

An impairment loss is recognised for the expected credit losses on financial assets when there is an increased probability that the counterparty will be unable to settle an instrument's contractual cash flows on the contractual due dates, a reduction in the amounts expected to be recovered, or both.

The probability of default and expected amounts recoverable is assessed using reasonable and supportable past and forward-looking information that is available without undue cost or effort. The expected credit loss is a probability-weighted amount determined from a range of outcomes and takes into account the time value of money.

Impairment of intercompany loans measured at amortised cost

The measurement of impairment losses depends on whether the financial asset is "performing", "underperforming" or "non-performing" based on the Company's assessment of increases in the credit risk of the financial asset since its initial recognition and any events that have occurred before the year end which have a detrimental impact on cash flows.

The financial asset moves from "performing" to "underperforming" when the increase in credit risk since initial recognition becomes significant.

In assessing whether credit risk has increased significantly, the Company compares the risk of default at the year end with the risk of a default when the investment was originally recognised using reasonable and supportable past and forward-looking information that is available without undue cost.

The risk of a default occurring takes into consideration default events that are possible within twelve months of the year end ("the twelve-month expected credit losses") for "performing" financial assets, and all possible default events over the expected life of those receivables ("the lifetime expected credit losses") for "underperforming" financial assets.

Impairment losses, and any subsequent reversals of impairment losses, are adjusted against the carrying amount of the receivable and are recognised in profit or loss.

(m) Inventories

Inventories are stated at the lower of cost and net realisable value. Cost based on latest contractual prices includes all costs incurred in bringing each product to its present location and condition. Net realisable value is based on estimated selling price less any further costs expected to be incurred to disposal. Provision is made for slow-moving or obsolete items.

(n) Trade and other receivables

Trade receivables are initially measured at their transaction price. Group and other receivables are initially measured at fair value plus transaction costs.

Receivables are held to collect the contractual cash flows which are solely payments of principal and interest. Therefore, these receivables are subsequently measured at amortised cost using the effective interest rate method.

(o) Cash, cash equivalents and short-term investments

Cash and cash equivalents comprise cash at hand and deposits with maturities of three months or less. Short-term investments comprise deposits with maturities of more than three months, but no greater than twelve months.

(p) Financial liabilities and equity

Financial liabilities and equity instruments are classified according to the substance of the contractual arrangements entered into. An equity instrument is any contract that evidences a residual interest in the assets of the Company after deducting all of its liabilities.

(q) Trade and other payables

Trade, Group and other payables are initially measured at fair value, net of direct transaction costs, and subsequently measured at amortised cost using the effective interest rate method.

Receivables are held to collect the contractual cash flows which are solely payments of principal and interest. Therefore, these receivables are subsequently measured at amortised cost using the effective interest rate method.

(r) Leases

In 2019 the Group and Company applied IFRS 16 to all leases for the first time. After assessing the effect of the different available approaches to be limited the Group and Company elected to recognise the cumulative adjustments in the year. The following transitional provisions were applied in adopting this approach:

- A single discount rate was applied to portfolios of leases with similar characteristics.
- The right-of-use assets were not assessed for impairment at 1 January 2019, but were reduced by the amount of any onerous lease provisions at that date.
- Initial direct costs were excluded from the measurement of the right-of-use assets.
- Hindsight was applied in determining the lease term for contracts that contain lease extension or termination options.

Right-of-use assets and a lease liability are recognised for all leases except 'low-value' and 'short' term leases where lease payments are recognised on a straight-line basis over the lease term.

The amounts recognised for leases at 1 January 2019, were measured as follows:

3. Significant accounting policies continued

(r) Leases continued

(i) Operating leases under IAS 17, except 'low-value' and 'short-term' leases

The lease liability is measured at the present value of the remaining lease payments at 1 January 2019, discounted at the lessee's incremental borrowing rate at that date.

The right-of-use asset is measured as if IFRS 16 had been applied from commencement of the lease, adjusted for accrued or prepaid operating lease payments, using the lessee's incremental borrowing rate at 1 January 2019 to discount future payments.

The right-of-use asset is adjusted for any re-measurement of the lease liability and lease modifications, as follows:

- An estimate of costs to be incurred in restoring the leased asset to the condition required under the terms and conditions of the lease is recognised as part of the cost of the right-of-use asset when the group incurs the obligation for these costs.
- The costs are incurred at the start of the lease or over the lease term. The provision is measured at the best estimate of the expenditure required to settle the obligation.

(ii) Leases – the Group as lessee

On commencement of a contract (or part of a contract) which gives the Group, or Company, the right to use an asset for a period of time in exchange for consideration, the group recognises a right-of-use asset and a lease liability unless the lease qualifies as a 'short-term' lease or a 'low-value' lease.

(iii) 'Low-value' leases

When the value of the underlying asset is £10,000 or less, the Group and Company both recognise, and continue to recognise, the lease payments associated with those leases on a straight-line basis over the lease term.

(iv) 'Short-term' leases

Where the lease term is twelve months or less and the lease does not contain an option to purchase the leased asset, lease payments are recognised as an expense on a straight-line basis over the lease term.

On transition to IFRS 16, where the lease term ended before 31 December 2019, the group continued to recognise the lease payments associated with those leases on a straight-line basis over the lease term.

(v) Leases assessed on a portfolio basis

The Group elected to treat its property leases as a portfolio as all land and buildings have similar lease characteristics. Consequently, IFRS 16 is applied to all land and building leases, not otherwise included in low-value or short-term leases, in aggregate rather than to each individual lease.

(vi) Initial measurement of the lease liability

The lease liability is initially measured at the present value of the lease payments during the lease term discounted using the interest rate implicit in the lease, or the incremental borrowing rate if the interest rate implicit in the lease cannot be readily determined.

The lease term is the non-cancellable period of the lease plus extension periods that the group is reasonably certain to exercise and termination periods that the group is reasonably certain not to exercise.

Lease payments include fixed payments, less any lease incentives receivable, variable lease payments dependant on an index or a rate (such as those linked to LIBOR) and any residual value guarantees. Variable lease payments are initially measured using the index or rate when the leased asset is available for use.

Termination penalties are included in the lease payments if the lease term has been adjusted because the Group reasonably expects to exercise an option to terminate the lease.

The exercise price of an option to purchase the leased asset is included in the lease liability when the group is reasonably certain to exercise that option.

(vii) Subsequent measurement of the lease liability

The lease liability is subsequently increased for a constant periodic rate of interest on the remaining balance of the lease liability and reduced for lease payments.

Interest on the lease liability is recognised in profit or loss, unless interest is directly attributable to qualifying assets. The Group had no such liabilities during the current and previous year.

Variable lease payments not included in the measurement of the lease liability as they are not dependent on an index or rate, are recognised in profit or loss in the period in which the event or condition that triggers those payments occurs.

(viii) Re-measurement of the lease liability

The lease liability is adjusted for changes arising from the original terms and conditions of the lease that change the lease term, the Group's assessment of its option to purchase the leased asset, the amount expected to be payable under a residual value guarantee and/or changes in lease payments due to a change in an index or rate. The adjustment to the lease liability is recognised when the change takes effect and is adjusted against the right-of-use asset, unless the carrying amount of the right-of-use asset is reduced to nil, when any further adjustment is recognised in profit or loss.

Adjustments to the lease payments arising from a change in the lease term or the lessee's assessment of its option to purchase the leased asset are discounted using a revised discount rate. The revised discount rate is calculated as the interest rate implicit in the lease for the remainder of the lease term, or if that rate cannot be readily determined, the lessee's incremental borrowing rate at the date of reassessment.

3. Significant accounting policies continued

(r) Leases continued

(viii) Re-measurement of the lease liability continued

Changes to the amounts expected to be payable under a residual value guarantee and changes to lease payments due to a change in an index or rate are recognised when the change takes effect and are discounted at the original discount rate unless the change is due to a change in floating interest rates, when the discount rate is revised to reflect the changes in interest rate.

(ix) Lease modifications

A lease modification is a change that was not part of the original terms and conditions of the lease and is accounted for as a separate lease if it increases the scope of the lease by adding the right to use one or more additional assets with a commensurate adjustment to the payments under the lease.

For a lease modification not accounted for as a separate lease, the lease liability is adjusted for the revised lease payments, discounted using a revised discount rate. The revised discount rate used is the interest rate implicit in the lease for the remainder of the lease term, or if that rate cannot be readily determined, the lessee company's incremental borrowing rate at the date of the modification.

Where the lease modification decreases the scope of the lease, the carrying amount of the right-of-use asset is reduced to reflect the partial or full termination of the lease. Any difference between the adjustment to the lease liability and the adjustment to the right-of-use asset is recognised in profit or loss.

For all other lease modifications, the adjustment to the lease liability is recognised as an adjustment to the right-of-use asset.

(x) Significant judgements and major sources of estimation uncertainty

The Group determined that all leases of assets with a value, when new, of £10,000, will be classified and accounted for as 'low-value' leases.

The Group applies judgement in determining whether individual leases can be accounted for as a portfolio. The judgements include an assessment of whether the leases share similar characteristics and whether the financial statements would be materially different if each lease was accounted for individually.

In determining the lease term, the group assesses whether it is reasonably certain to exercise, or not to exercise, options to extend or terminate a lease. This assessment is made at the start of the lease and is re-assessed if significant events of changes in circumstances occur that are within the lessee's control.

The Group uses judgement to assess whether the interest rate implicit in the lease is readily determinable.

When the interest rate implicit in the lease is not readily determinable, the Group estimates the incremental borrowing rate based on its external borrowings secured against similar asset, adjusted for the term of the lease.

The Group estimates the amount expected to be paid under a residual value guarantee taking into consideration current market prices for similar assets of a similar age and condition and the remaining term of the lease.

The Group makes estimates of the cost of restoring leased assets to their original condition when required to do so under the terms and conditions of the lease. Those estimates are based on the current condition of the leased assets and past experience of restoration costs.

The Group applied judgement in applying the following transition provisions in IFRS 16:

- Determining whether leases have similar characteristics to apply a single discount rate. Lease portfolios have been grouped between leases of UK and European properties, UK and European machinery, UK and European office equipment and UK and European vehicles. These classes of asset have similar lease terms.

3. Significant accounting policies continued

(s) Share-based payments including warrants

Equity settled share-based payment transactions are measured with reference to the fair value at the date of grant, recognised on a straight-line basis over the vesting period, based on the Company's estimate of shares that will eventually vest. Where no vesting period exists, the full fair value is recognised immediately. Fair value is measured using a suitable option pricing model.

At each reporting date before vesting, the cumulative expense is calculated, representing the extent to which the vesting period has expired and management's best estimate of the achievement or otherwise of non-market conditions and the number of equity instruments that will ultimately vest. The movement in cumulative expense since the previous reporting date is recognised in the Group Statement of Comprehensive Income, with a corresponding entry in equity.

Where the terms of an equity-settled award are modified or a new award is designated as replacing a cancelled or settled award, the cost based on the original award terms continues to be recognised over the remainder of the original vesting period. In addition, an expense is recognised over the remainder of the new vesting period for the incremental fair value of any modification, based on the difference between the fair value of the original award and the fair value of the modified award, both as measured on the date of modification. No reduction is recognised if this difference is negative.

Where awards are granted to the employees of the subsidiary company, the fair value of the awards at grant date is recorded in the Company's financial statements as an increase in the value of the investment with a corresponding increase in equity via the share-based payment reserve.

(t) Share capital

Proceeds on issue of shares are included in shareholders' equity, net of transaction costs. The carrying amount is not remeasured in subsequent years.

(u) New accounting standards and interpretations

Adoption of IFRS

The Group and Company financial statements have been prepared in accordance with IFRS, IAS and IFRS Interpretations Committee ("IFRSIC") effective as at 31 December 2020. The Group and Company have not chosen to adopt any amendments or revised standards early.

Where applicable ,the following amendments to accounting standards were adopted by the Group on the effective date during the current year. The Group has applied these standards in the preparation of the financial statements and has not adopted any new or amended standards early.

Amendment to IFRS 3	Business Combinations	1 January 2020
Amendment to IFRS 3	Business Combinations	1 January 2020
Amendments to IFRS 9, IAS 39 and IFRS17	Interest Rate Benchmark Reform	1 January 2020
Amendments to IAS 1 and IAS 8	Definition of Material	1 January 2020
UK IFRS	Departure from EU IFRS on Brexit	31 January 2020
Amendment to IFRS 16	COVID-19 - Related Rent Concessions	1 June 2020

Any significant impact on adoption is included in these notes.

UK IFRS

On 31 January 2020, the UK exited the EU and entered the transitional period during which companies with a financial year beginning on or before 31 December 2020, who's debt or equity securities are traded in a regulated exchange in the UK, continue to apply the IFRS standards adopted by the EU.

On Adoption of UK IFRS, the Directors do not currently expect any changes that would require disclosure.

IFRS issued but not yet effective

At the date of issue of these financial statements, the following accounting standards and interpretations, which have not been applied, were in issue but not yet effective. The Directors do not anticipate adoption of the standards listed below will have a material impact on the financial statements or they consider the implementation too uncertain to speculate on the impact on the accounts at this point in time.

Amendments to IFRS 4	Insurance Contracts – deferral of IFRS19	1 January 2021
Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16	Interest Rate Benchmark Reform - Phase 2	1 January 2021

4. Revenue

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Revenue	**534**	211

In October 2019, the Group entered into a collaboration agreement with MSD. The collaboration agreement was for the use of the MicroRx platform to discover and develop LBP candidates as vaccines in up to three indications and the Group is responsible for the discovery and engineering of LBP's.

No other revenue was generated during the year.

5. Operating loss

By nature:	**Year to 31 December 2020 £000**	Year to 31 December 2019 £000
Operating loss is stated after charging /(crediting):		
Research and development expense		
Depreciation on property, plant, and equipment		
- Owned assets	**731**	780
- Right-of-use assets	**52**	52
Amortisation of intangible assets	**139**	86
Staff costs (see note 7)	**4,522**	5,027
Operating lease rentals:		
- Land and buildings	**133**	155
- Equipment	**-**	2
Other contractual commitments	**9,213**	12,688
Other research and development costs	**7,251**	7,722
	22,041	26,512
Administrative expenses		
Depreciation on property, plant, and equipment		
- Owned assets	**126**	141
- Right-of-use assets	**93**	92
Amortisation of intangible assets	**64**	130
Profit on disposal of property, plant and equipment	**—**	(17)
Loss on disposal of intangible assets	**—**	29
Staff costs (see note 7)	**1,353**	1,707
Operating lease rentals:		
- Equipment	**2**	2
Auditor's remuneration	**469**	53
Legal and professional	**2,013**	464
Consultancy	**269**	23
Share based payments including warrants	**3,345**	267
Other contractual commitments	**488**	703
Other administrative costs	**857**	765
	9,079	4,359
Foreign currency (gains)/losses	**(363)**	1,006
Other income	**(45)**	(34)
Auditor's remuneration:		
RSM UK, UK audit services:		
- Fees payable to Company auditor for the audit of the IFRS parent and the consolidated accounts	**44**	40
- Auditing the financial statements of subsidiaries pursuant to legislation	**11**	10
- Non-audit services	**3**	3
RSM US, US affiliated audit services:		
- Fees payable to US Company auditor for the audit of the US GAAP consolidated accounts (current year)	**127**	—
- Fees payable to US Company auditor for the audit of the US GAAP consolidated accounts (prior years)	**228**	—
- Non-audit services included in the income statement for the review of the opening balances	**56**	—
- Consideration of F-4 registration statement (included in prepaid share issue costs)	**112**	—
Total auditor's and affiliated auditor's remuneration	**581**	53

6. Non-recurring costs

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Fair value adjustment on contingent consideration	—	2,659

From inception to 23 August 2019, the Group had provided for the contingent consideration on the achievement of three time-based milestones for the validation of the MicroDx platform by 4D Pharma Cork Ltd.

The contingent liability was calculated upon the acquisition of 4D Pharma Cork Limited and was based on the discounted probability of the liability at that time. The probability of future milestones is re-assessed as the timepoints for the milestones are reached, these milestones are:

1) Technical validation of a diagnostic platform for IBS dysbiosis

The milestone was achieved by 23 August 2017 and triggered the issue of 635,692 shares for an aggregate market value of €2.6 million (at £3.7575 per 4D Pharma plc share, being the average mid-market price of a Company share for the five business days immediately preceding the date of allotment). The shares were subsequently admitted on 31 August 2017.

2) Clinical validation of the optimal IBS dysbiosis diagnostic platform based on more than 1,000 patients in a multicentre trial

There were no adverse indicators relating to the clinical validation of the platform at 31 December 2020, but the time-based criteria for the completion of the milestone, which required completion of this phase by 23 August 2019, was not achieved and the fair value of the contingent consideration has been adjusted by £1.877 million to bring the balance at 23 August 2019 to £Nil.

3) Regulatory approval of a diagnostic platform for IBS dysbiosis

The third milestone is also time based and linked approval being achieved by 23 August 2020. Regulatory approval was not achieved in time for the time-based requirements of the milestone and the probability of achieving milestone three by the required date was considered to be minimal, as a result the fair value was reduced in the year ended 31 December 2019 to £Nil, releasing £0.782 million of the contingent sideration.

7. Staff costs

	Year to 31 December 2020			Year to 31 December 2019		
Group	Research and development £000	Administrative £000	Total £000	Research and development £000	Administrative £000	Total £000
Wages and salaries	**3,657**	**1,101**	**4,758**	4,087	1,385	5,472
Social security costs	**619**	**148**	**767**	653	191	844
Pension contributions	**84**	**31**	**115**	98	53	151
	4,360	**1,280**	**5,640**	4,838	1,629	6,467
Share-based compensation	**162**	**73**	**235**	189	78	267
	4,522	**1,353**	**5,875**	5,027	1,707	6,734
Directors' remuneration (including benefits in kind) included in the aggregate remuneration above comprised:						
Emoluments for qualifying services	**—**	**387**	**387**	—	371	371

	Year to 31 December 2020			Year to 31 December 2019		
Company	Research and development £000	Administrative £000	Total £000	Research and development £000	Administrative £000	Total £000
Wages and salaries	**1,120**	**646**	**1,766**	1,330	1,061	2,391
Social security costs	**192**	**75**	**267**	233	129	362
Pension contributions	**22**	**29**	**51**	32	50	82
	1,334	**750**	**2,084**	1,595	1,240	2,835
Share-based compensation	**54**	**73**	**127**	59	78	137
	1,388	**823**	**2,211**	1,654	1,318	2,972
Directors' remuneration (including benefits in kind) included in the aggregate remuneration above comprised:						
Emoluments for qualifying services	**—**	**387**	**387**	—	371	371

7. Staff costs continued

Directors' emoluments (excluding social security costs but including benefits in kind) disclosed above include £101,963 (31 December 2019: £101,823) paid to the highest paid director.

The directors were not granted any share options in the year ended 31 December 2020 or 31 December 2019 and none of the directors held any share options at 31 December 2020.

An analysis of the highest paid director's remuneration is included in the Report of the Remuneration Committee.

The average number of employees during the year (including directors) was as follows:

	Year to 31 December 2020 Group Number	**Year to 31 December 2020 Company Number**	Year to 31 December 2019 Group Number	Year to 31 December 2019 Company Number
Directors	**6**	**6**	7	7
Scientific and administrative staff	**109**	**16**	120	22
	115	**22**	127	29

8. Finance income and finance expense

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Finance income		
Bank interest receivable	**5**	61
Finance expense		
Lease liability interest on:		
- Plant and equipment	**—**	—
- Land and buildings	**(173)**	(180)
Unwinding of discount	**—**	(334)
	(173)	(514)

Bank interest receivable includes £Nil (31 December 2019: £Nil) which is receivable after the year end.

9. Taxation

The tax credit is made up as follows:

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Current income tax		
Total current income tax	(3,473)	(5,351)
Adjustment in respect of prior years	42	(9)
Total income tax credit recognised in the year	(3,431)	(5,360)
Current deferred tax		
Previously recognised deferred tax gains offset against losses	(940)	—
Current year charge	(12)	—
Total deferred tax	**(952)**	—
Total income tax credit recognised in the year	**(4,383)**	(5,360)

9. Taxation continued

The income tax credit can be reconciled to the accounting loss as follows:

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Loss before taxation	**(30,346)**	(29,426)
Tax at the average standard rate of 19.58% (31 December 2019: 19.07%)	**(5,942)**	(5,612)
Effects of:		
Expenses not deductible for tax purposes	**656**	16
Adjustments from foreign currency translations on subsidiaries	**(7)**	(54)
Enhanced research and development expenditure	**(2,464)**	(3,804)
Property, plant, equipment and software temporary differences	**97**	64
Deferred tax not provided on losses	**3,397**	2,406
Utilised losses from prior years	**(28)**	—
Adjustment in respect of prior years	**42**	(9)
Offset of deferred tax liabilities against deferred tax assets in the year	**(940)**	—
Reversal of temporary differences	**(12)**	—
Effects of variation on tax reclaims over the standard rate	**818**	1,633
Tax income tax credit recognised in the year	**(4,383)**	(5,360)

The enacted UK corporation tax rate of 19% forms the basis for the UK element of the deferred tax calculation noted below, the equivalent rates used for Ireland and Spain were 12.5% and 25% respectively. However, following the UK budget in 2021 the chancellor announced an increase to the main rate of corporation tax rate in the UK to 25% from April 2023, if applied this would significantly increase the value of the unrecognised deferred tax asset.

At 31 December 2020, the Group had tax losses available for carry forward of approximately £66.6 million (31 December 2019: £48.3 million). The Group has not recognised deferred tax assets relating to such earned forward losses of approximately £12.6 million (31 December 2019: £6.8 million).

At 31 December 2020, the Company had tax losses available for carry forward of approximately £28.0 million (31 December 2019: £18.4 million). The Company has not recognised deferred tax assets relating to such earned forward losses of approximately £5.3 million (31 December 2019: £3.5 million).

Group management considers that there is insufficient evidence of future taxable income, taxable temporary differences and feasible tax-planning strategies to utilise all of the cumulative losses and therefore it is not considered certain that the deferred tax assets will be realised in full. If future income differs from current projections, this could significantly impact the tax charge or benefit in future years.

10. Loss per share

(a) Basic and diluted

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Loss for the year attributable to equity shareholders	**(25,963)**	(24,066)
Weighted average number of shares		
Ordinary shares in issue	**113,851,960**	65,493,842
Basic loss per share (pence)	**(22.80)p**	(36.75)p

The basic and diluted loss per share are the same as the effect of share options and warrants is anti-dilutive.

(b) Adjusted

Adjusted loss per share is calculated after adjusting for the effect of non-recurring income and expenses in relation to the reassessment of the contingent liability.

Reconciliation of adjusted loss after tax:

	Year to 31 December 2020 £000	Year to 31 December 2019 £000
Reported loss after tax	**(25,963)**	(24,066)
Non-recurring income	**—**	(2,659)
Adjusted loss after tax	**(25,963)**	(26,725)
Adjusted basic loss per share (pence)	**(22.80)p**	(40.81)p

11. Property, plant and equipment

Group	Plant and machinery £000	Fixtures, fittings and office equipment £000	Land and buildings £000	Total £000
Cost				
At 31 December 2018	5,780	215	1,148	7,143
Additions	534	—	1,135	1,669
Disposals	(56)	—	—	(56)
Exchange rate adjustment	(271)	—	(76)	(347)
At 31 December 2019	5,987	215	2,207	8,409
Additions	163	—	—	163
Exchange rate adjustment	238	—	63	301
At 31 December 2020	**6,388**	**215**	**2,270**	**8,873**
Depreciation				
At 31 December 2018	1,885	111	282	2,278
Provided during the year	726	52	287	1,065
Released on disposal	(30)	—	—	(30)
Exchange rate adjustment	(52)	—	(12)	(64)
At 31 December 2019	2,529	163	557	3,249
Provided during the year	682	32	289	1,003
Exchange rate adjustment	103	—	24	127
At 31 December 2020	**3,314**	**195**	**870**	**4,379**
Net book value:				
At 31 December 2020	**3,074**	**20**	**1,400**	**4,494**
At 31 December 2019	3,458	52	1,650	5,160
At 31 December 2018	3,895	104	866	4,865

Included in the totals above are the following assets held under leases, these agreements are secured against the assets to which they relate.

11. Property, plant and equipment continued

Group assets under lease agreements	Owned assets: Plant and machinery £000	Owned assets: Total owned assets £000	Right-of-use assets: Land and buildings £000	Total £000
Cost				
At 31 December 2018	47	47	—	47
Additions	—	—	1,131	1,131
Exchange rate adjustment	(3)	(3)	(25)	(28)
At 31 December 2019	44	44	1,106	1,150
Exchange rate adjustment	2	2	19	21
At 31 December 2020	**46**	**46**	**1,125**	**1,171**
Depreciation				
At 31 December 2018	18	18	—	18
Provided during the year	7	7	144	151
Exchange rate adjustment	(1)	(1)	(2)	(3)
At 31 December 2019	24	24	142	166
Provided during the year	5	5	145	150
Exchange rate adjustment	2	2	3	5
At 31 December 2020	**31**	**31**	**290**	**321**
Net book value:				
At 31 December 2020	**15**	**15**	**835**	**850**
At 31 December 2019	20	20	964	984
At 31 December 2018	29	29	—	29

Company	Plant and machinery £000	Fixtures, fittings and office equipment £000	Land and buildings £000	Total £000
Cost				
At 31 December 2018	245	184	307	736
Additions	29	—	755	784
Disposals	(56)	—	—	(56)
At 31 December 2019	218	184	1,062	1,464
Additions	4	—	—	4
At 31 December 2020	**222**	**184**	**1,062**	**1,468**
Depreciation				
At 31 December 2018	95	92	84	271
Provided during the year	48	45	155	248
Released on disposal	(30)	—	—	(30)
At 31 December 2019	113	137	239	489
Provided during the year	39	28	154	221
At 31 December 2020	**152**	**165**	**393**	**710**
Net book value:				
At 31 December 2020	**70**	**19**	**669**	**758**
At 31 December 2019	105	47	823	975
At 31 December 2018	150	92	223	465

11. Property, plant and equipment continued

Company assets under lease agreements	Right-of-use assets Land and buildings £000	 Total £000
Cost		
At 31 December 2018	—	—
Additions	755	755
At 31 December 2019 and 31 December 2020	**755**	**755**
Depreciation		
At 31 December 2018	—	—
Provided during the year	92	92
At 31 December 2019	92	92
Provided during the year	94	94
At 31 December 2020	**186**	**186**
Net book value:		
At 31 December 2020	**569**	**569**
At 31 December 2019	663	663
At 31 December 2018	—	—

Right-of-use assets were created in 2019 on application of IFRS 16 ‘Leases’. This conversion has resulted in leases previously categorised as operating leases and expensed to the Statement of Comprehensive Income being recognised as right-of-use assets with an associated lease liability included in the Statement of Financial Position, for further details see note 19.

12. Intangible assets

Group	Software £000	Patents £000	Intellectual property £000	Goodwill £000	Total £000
Cost					
At 31 December 2018	336	1,081	4,507	9,453	15,377
Additions	57	—	—	—	57
Disposals	(110)	—	—	—	(110)
Exchange rate adjustment	(5)	—	—	(266)	(271)
At 31 December 2019	278	1,081	4,507	9,187	15,053
Additions	15	—	—	—	15
Exchange rate adjustment	—	—	—	225	225
At 31 December 2020	**293**	**1,081**	**4,507**	**9,412**	**15,293**
Amortisation					
At 31 December 2018	176	756	—	—	932
Provided during the year	84	132	—	—	216
Disposals	(81)	—	—	—	(81)
Exchange rate adjustment	(2)	—	—	—	(2)
At 31 December 2019	177	888	—	—	1,065
Provided during the year	71	132	—	—	203
At 31 December 2020	**248**	**1,020**	**—**	**—**	**1,268**
Net book value:					
At 31 December 2020	**45**	**61**	**4,507**	**9,412**	**14,025**
At 31 December 2019	101	193	4,507	9,187	13,988
At 31 December 2018	160	325	4,507	9,453	14,445

12. Intangible assets continued

Company	Software £000	Patents £000	Total £000
Cost			
At 31 December 2018	196	1,076	1,272
Additions	57	—	57
Disposals	(14)	—	(14)
At 31 December 2019	239	1,076	1,315
Additions	9	—	9
At 31 December 2020	**248**	**1,076**	**1,324**
Amortisation			
At 31 December 2018	90	597	687
Provided during the year	70	198	268
Disposals	(13)	—	(13)
At 31 December 2019	147	795	942
Provided during the year	65	198	263
At 31 December 2020	212	993	1,205
Net book value			
At 31 December 2020	**36**	**83**	**119**
At 31 December 2019	92	281	373
At 31 December 2018	106	479	585

Goodwill amounting to £9.390 million, intellectual property amounting to £4.507 million and patent rights amounting to £1.081 million relate to a single cash-generating unit ("CGU"), contained in the acquisitions of 4D Pharma Research Limited, 4D Pharma Leon, S.L.U. and 4D Pharma Cork Limited (formerly Tucana Health Limited). These entities together provide the necessary facilities and resources to enable the Group to successfully research, manufacture, gain approval for and commercialise Live Biotherapeutic Products.

Goodwill, which has arisen on the business combinations, represents staff and accumulated know-how after fair value has been attributed to all other assets and liabilities acquired. Intellectual property of £1.923 million recognised on the business combinations represents bacteria identified by the Group's know-how and processes and at different stages of research and development, from early identification to patented strains of bacteria. Intellectual property of £2.584 million represents the methods and know-how in relation to the MicroDx platform acquired as part of 4D Pharma Cork Limited (formerly Tucana Health Limited).

During the year goodwill, intellectual property, patents and associated property, plant and equipment was tested for impairment in accordance with IAS 36 Impairment of Assets. The recoverable amount of the CGU exceeds the carrying amount of goodwill, intellectual property, patents and associated property, plant and equipment. The recoverable amount of the CGU has been measured using a value-in-use calculation and, as such, no impairment was deemed necessary. The key assumptions used, which are based on both management's past experience as well as externally provided reports, for the value-in-use calculations are those relating to the risk-adjusted net present value of candidates that have been identified as potential future products as of 31 December 2020 and for which estimated potential peak sales and future cash flows have been estimated. In addition, an external valuation of intellectual property contained via the acquisition of 4D Pharma Cork Limited (formerly Tucana Health Limited) has been used. Valuation of an early-stage drug discovery pharmaceutical company is a notoriously difficult task and an analysis of financial history gives little indication of future performance. Despite this, for products currently in development, sales potentials can be estimated and management has used its own experience as well as consulting with external experts to establish best estimates of sales pricing and revenue forecasting and these can provide the starting point for valuing these products and ensuring that their value has not been impaired.

The recoverable amount of goodwill, intellectual property, patents and associated property, plant and equipment exceed the carrying amount by 3,656%. The key assumption considered most sensitive for the value-in-use calculation is that regarding the discount rate applied to the net present value calculations. Management has performed sensitivity analysis on this key assumption and increased this from 10% to 20%. Due to the headroom which exists between the recoverable amount and the carrying value there is no reasonable possible change in this assumption that would cause the CGU's carrying value to exceed its recoverable amount.

13. Investment and loans to subsidiaries

Non-current assets

Company	Investment in subsidiaries £000
At 31 December 2018	11,805
Share based payments with subsidiaries failing to meet vesting criteria	(232)
Share based payments issued to employees in subsidiaries	130
At 31 December 2019	11,703
Share based payments with subsidiaries failing to meet vesting criteria	(98)
Share based payments issued to employees in subsidiaries	108
At 31 December 2020	**11,713**
By subsidiary	
4D Pharma Research Limited	2,402
4D Pharma Cork Limited	3,831
4D Pharma Leon S.L.U.	5,480
At 31 December 2020	**11,713**

Current assets

Company	Loans to Subsidiary undertakings £000
Company	
At 31 December 2018	50,650
Additions in the year	9,170
Impairment provision	(177)
At 31 December 2019	59,643
Additions in the year	14,257
Impairment provision	(1,230)
At 31 December 2020	**72,670**
By subsidiary	
4D Pharma Research Limited	66,165
4D Pharma Cork Limited	2,858
4D Pharma Leon S.L.U.	3,620
4D Pharma Delaware Inc.	27
At 31 December 2020	**72,670**

IFRS 9 requires intercompany loans be recognised based on the recoverability of the discounted value of future cash flows with effective interest taken to the income statement and that any impairment be recognised. The Company and Group have reviewed the position on loans and have agreed that they are current in nature and that; while there is no evidence of impairment exists to the underlying assets; the reduced level of activity in Cork, brought about after streamlining of staff and overheads was undertake to reduce costs during COVID-19, increases the inherent probability that sufficient future discounted cash flows will be available to repay the loan, a provision of £1,407,641 or 33% of the balance (31 December 2019: £177,433 or 5% of the balance) has been included in in the current year in recognition of the increased risk involved.

Details of the share-based payments issued to employees in subsidiaries are included in note 22.

13. Investment and loans to subsidiaries continued

Subsidiary undertakings

Subsidiary undertakings	Country of incorporation	Registered office	Principal activity	**Holding at 31 December 2020**
4D Pharma Research Limited	Scotland	Life Sciences Innovation Building, Cornhill Road, Aberdeen AB25 2ZS	Research and development	**100%**
4D Pharma Cork Limited	Ireland	Room 447, Food Sciences Building, University College Cork, Western Road, Cork T12 YN60	Research and development	**100%**
4D Pharma S.L.U.	Spain	Parque Tecnológico de León, Parcela, M–10.4, 24009, Armunia, León, Spain	Production of live biotherapeutics	**100%**
4D Pharma Delaware Inc.	USA	1209 Orange Street, Wilmington, New Castle, Delaware, 19801	Provision of services	**100%**
Dolphin Merger Sub Limited	British Virgin Isles	Palm Grove House, P.O. Box 438, Road Town, VG1110, Tortola	Dormant	**100%**
Microbiomics Limited	England and Wales	9 Bond Court, Leeds LS1 2JZ	Dormant	**100%**
The Microbiota Company Limited	England and Wales	9 Bond Court, Leeds LS1 2JZ	Dormant	**100%**

The shares in all the companies listed above are held by 4D pharma plc.

4D Pharma Delaware Inc. was incorporated on 24 July 2020.

Dolphin Merger Sub Limited was incorporated on 12 October 2020.

The following companies were exempt from the requirements of the Companies Act 2006 to prepare individual accounts for the financial year ended 31 December 2020, by virtue of section 394A of the Companies Act 2006:

Subsidiary undertakings	Company number
The Microbiota Company Limited	09132301
Microbiomics Limited	08871792

14. Inventories

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Consumables and materials	**291**	**—**	198	—

The Directors consider that the carrying amount of inventories is the lower of cost and market value.

During the year £0.74 million (31 December 2019: £1.20 million) of inventories were expensed to the Income Statement.

15. Trade and other receivables

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Prepayments	**1,752**	**439**	1,118	371
Prepaid share issue costs	**1,471**	**1,471**	—	—
	3,223	**1,910**	1,118	371

Prepaid share issue costs relate to expenses incurred in advance of the Longevity merger transaction.

The Directors consider that the carrying amount of trade and other receivables approximates to their fair value.

16. Taxation receivables

Non-current receivables	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Corporation tax	**177**	**—**	188	—

Non-current assets include research and development tax claims in overseas subsidiaries that are repayable in more than one year.

Current receivables	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Corporation tax	**3,512**	**1,326**	5,375	1,741
VAT	**924**	**225**	747	250
	4,436	**1,551**	6,122	1,991

The Directors consider that the carrying amount of taxation receivables approximates to their fair value.

17. Cash, cash equivalents and deposits

	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Cash and cash equivalents	**8,775**	**6,213**	3,836	2,921

At 31 December 2020 no cash was held on deposit in either the Group or Company.

The Directors consider that the carrying value of cash and cash equivalents approximates their fair value. For details on the Group's credit risk management refer to note 25.

18. Trade and other payables

Current	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Trade payables	**3,300**	**2,583**	1,224	515
Other payables	**22**	**17**	27	19
Taxation and social security	**223**	**82**	255	123
Accruals	**1,604**	**893**	2,925	1,183
Deferred income	**1,230**	**—**	1,761	**—**
	6,379	**3,575**	6,192	1,840

Trade and other payables principally comprise amounts outstanding for trade purchases and ongoing costs. Trade payables are non-interest bearing and are typically settled on 30 to 45-day terms.

The Directors consider that the carrying value of trade payables, other payables and accruals approximates to their fair value.

The Group has financial risk management policies in place to ensure that any trade payables are settled within the credit time frame and no interest has been charged by any suppliers as a result of late payment of invoices during the reporting year presented herein.

19. Lease liabilities

Lease liabilities, excluding short term and low value leases, included in the statement of financial position were as follows:

Lease liabilities	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Current liabilities	**73**	**37**	68	32
Non-current liabilities	**986**	**716**	1,043	754
	1,059	**753**	1,111	786

19. Lease liabilities continued

Maturity analysis of lease liabilities

The maturity of the gross contractual undiscounted cash flows due on the Group's lease liabilities (excluding short-term and low-value leases) is set out below based on the period between 31 December 2020 and the contractual maturity date.

Analysed as follows:

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Land and buildings				
Due within six months	**115**	**78**	114	78
Due between six months and one year	**115**	**78**	114	78
Due between one and two years	**229**	**155**	229	155
Due between two to five years	**738**	**510**	725	498
Due in more than five years	**569**	**505**	815	672
	1,766	**1,326**	1,997	1,481
Plant and equipment				
Due within six months	**5**	**—**	7	—
Due between six months and one year	**—**	**—**	7	—
Due between one and two years	**—**	**—**	3	—
Due between two to five years	**—**	**—**	—	—
Due in more than five years	**—**	**—**	—	—
	5	**—**	17	—
Total				
Due within six months	**120**	**78**	121	78
Due between six months and one year	**115**	**78**	121	78
Due between one and two years	**229**	**155**	232	155
Due between two to five years	**738**	**510**	725	498
Due in more than five years	**569**	**505**	815	672
	1,771	**1,326**	2,014	1,481

19. Lease liabilities continued

Maturity analysis of lease liabilities continued

The maturity of the net contractual discounted cash flows due on the Group's lease liabilities (excluding short-term and low-value leases) is set out below based on the period between 31 December 2020 and the contractual maturity date.

Analysed as follows:

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Land and buildings				
Due within six months	**14**	**16**	14	16
Due between six months and one year	**55**	**21**	43	16
Due between one and two years	**76**	**38**	74	38
Due between two to five years	**413**	**248**	314	189
Due in more than five years	**497**	**430**	651	527
	1,055	**753**	1,096	786
Plant and equipment				
Due within six months	**4**	**—**	6	—
Due between six months and one year	**—**	**—**	5	—
Due between one and two years	**—**	**—**	4	—
Due between two to five years	**—**	**—**	—	—
Due in more than five years	**—**	**—**	—	—
	4	**—**	15	—
Total				
Due within six months	**18**	**16**	20	16
Due between six months and one year	**55**	**21**	48	16
Due between one and two years	**76**	**38**	78	38
Due between two to five years	**413**	**248**	314	189
Due in more than five years	**497**	**430**	651	527
	1,059	**753**	1,111	786

Lease terms

The group leases properties used for its operations in the UK and in Europe. Remaining lease terms are 5 to 6 years, with remining lease terms on the same leases at 31 December 2019 being for 6 to 7 years. Rentals are fixed with index linked increases at certain dates after inception of the lease. All property leases are subject to repair and maintenance terms and include provision for repair work on termination of the lease, estimations for the value of which have been included above.

Terms on specific property leases also include:

- UK property leases include a rent review by valuation in 2023
- European property includes a break clause in 2021

The Group leases certain plant and machinery in Europe, the term is for 4 years and payments are fixed.

The Group also leases photocopiers which are low value and leased over a period of no more than 3 years at inception.

Repayment and interest rates on lease agreements are fixed at the contract date.

The Group incremental borrowing rate for leases at 31 December 2020 was 16.59% (31 December 2019: 16.58%) over a weighted average remaining period of 72 months (31 December 2019: 84 months).

The Company incremental borrowing rate for leases at 31 December 2020 was 16.81% (31 December 2019: 16.81%) over a weighted average remaining period of 77 months (31 December 2018: 89 months).

All lease agreements are secured by the company against the assets to which they relate.

Disclosure of the carrying amounts of right-of-use assets by class and additions to right-of-use assets has been provided in note 11 'Property, plant and equipment'.

19. Lease liabilities continued

Effect of leases on financial performance

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Depreciation charge for the year included in land and buildings: for right-of-use assets:				
– Research and development costs	**52**	**—**	52	—
– Administrative expenses	**93**	**93**	92	92
Total depreciation charge on leased assets	**145**	**93**	144	92
Lease expense in the year included in 'research and development' for:				
– Short-term leases, excluding leases with a term of one month or less	**133**	**—**	155	—
– Leases of low-value assets, excluding short-term leases disclosed above	**—**	**—**	2	—
Lease expense in the year included in 'administrative expenses' for:				
– Short-term leases, excluding leases with a term of one month or less	**—**	**—**	—	—
– Leases of low-value assets, excluding short-term leases disclosed above	**2**	**2**	2	2
Interest expense for the year on lease liabilities recognised in 'finance costs'	**173**	**123**	180	127
Foreign currency adjustments to lease liabilities	**18**	**—**	(22)	—
Total effect of leases on financial performance	**471**	**218**	461	221

Effect of leases on cash flows

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Total cash outflow for leases in the year	**361**	**157**	377	157

Minimum lease commitments

The total minimum lease commitments for short-term and low-value leases at 31 December 2020 and 31 December 2019 were as follows:

	Short-term and low-value leases		**Short-term and low-value leases**	
	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Land and buildings				
Not later than one year	**81**	**—**	80	—
After one year but not more than five years	**—**	**—**	—	—
	81	**—**	80	—
Plant and equipment				
Not later than one year	**—**	**—**	1	1
After one year but not more than five years	**—**	**—**	—	—
	—	**—**	1	1
Total				
Not later than one year	**81**	**—**	81	1
After one year but not more than five years	**—**	**—**	—	—
	81	**—**	81	1

20. Deferred tax

	Group £000	Company £000
At 31 December 2018	966	—
Exchange rate movement	(2)	—
At 31 December 2019	964	—
Offset against taxable losses	(940)	—
Unwound in the year	(12)	—
Exchange rate movement	1	—
At 31 December 2020	13	—

Group management considers that there is insufficient evidence of future taxable income, taxable temporary differences and feasible tax-planning strategies to utilise all of the cumulative losses and therefore it is not considered certain that the deferred tax assets will be realised in full. If future income differs from current projections, this could significantly impact the tax charge or benefit in future years.

Though the Group's management do not believe that the recognition of a deferred tax asset is appropriate due to the significant uncertainty, the position related to the deferred tax liabilities of the Group have been reviewed during the year. Following the review, management have concluded that there are sufficient losses that the estimated liability arising on the acquisition of subsidiaries could be offset, reducing the estimated value of deferred tax arising on these to £Nil.

All deferred tax liabilities relate to the tax arising on fair value adjustment on the acquisition of subsidiaries and their assets and as such there is no provision for deferred tax in the Company.

21. Share capital

Group and Company	Ordinary shares Number	Share capital £000	Share premium £000	Total £000
Allotted, called up and fully paid ordinary shares of 0.25p				
Ordinary shares as at 1 January 2019 & 31 December 2019	**65,493,842**	**164**	**108,296**	**108,460**
Placing and subscription 18 February 2020	44,000,000	110	21,890	22,000
Expenses of placing and subscription on 18 February 2020	—	—	(1,065)	(1,065)
Warrants exercised (issued 18 February 2020)	75,693	—	76	76
Placing and subscription 13 July 2020	21,898,400	55	7,610	7,665
Expenses of placing and subscription on 13 July 2020	—	—	(529)	(529)
Ordinary shares as at 31 December 2020	**131,467,935**	**329**	**136,278**	**136,607**

The balances classified as share capital and share premium include the total net proceeds (nominal value and share premium respectively) on issue of the Company's equity share capital. The entire share capital consists of 0.25 pence ordinary shares.

Each ordinary 0.25 pence share is entitled to:

- one vote in any circumstances;
- Pari passu to dividend payments or any other distribution; and,
- Pari passu to participate in a distribution arising from a winding up of the Company.

The Company raised £22.0 million in gross proceeds (£20.9 million net) on 18 February 2020 from a placing of 16,820,080 new ordinary shares and a subscription of 27,179,920 new ordinary shares at an issue price of 50 pence per share. In addition, each place and subscriber was allotted one warrant for every two ordinary shares subscribed in the fundraising. As a result, a total of 22,000,000 warrants were allotted. Each warrant entitles the holder to subscribe for one ordinary share at an exercise price of 100p at any time up to the fifth anniversary of admission.

The Company raised £7.7 million in gross proceeds (£7.1 million net) on 13 July 2020 from a placing of 16,807,616 new ordinary shares and a subscription of 5,090,784 new ordinary shares at an issue price of 35 pence per share.

22. Share-based payment reserve

	Group			Company		
	Share based compensation £000	Warrants £000	Total £000	Share based compensation £000	Warrants £000	Total £000
At 31 December 2018	708	—	708	708	—	708
– Lapsed options	(608)	—	(608)	(375)	—	(375)
– Lapsed options relating to investment in subsidiaries	—	—	—	(233)	—	(233)
– Issued	267	—	267	137	—	137
– Issued to investment in subsidiaries	—	—	—	130	—	130
At 31 December 2019	367	—	367	367	—	367
– Lapsed options	(204)	—	(204)	(106)	—	(106)
– Lapsed options relating to investment in subsidiaries	—	—	—	(98)	—	(98)
– Issued	235	3,110	3,345	127	3,110	3,237
– Issued to investment in subsidiaries	—	—	—	108	—	108
– Exercised	—	(11)	(11)	—	(11)	(11)
At 31 December 2020	**398**	**3,099**	**3,497**	**398**	**3,099**	**3,497**

Share option schemes

The Group operates the following unapproved share option scheme:

4D pharma plc 2015 Long Term Incentive Plan ("LTIP")

Share options were granted to staff members on 11 May 2016, 24 May 2017, 26 October 2018 and 5 July 2019. Share options are awarded to management and key staff as a mechanism for attracting and retaining key members of staff. These options vest over period of up to three-years from the date of grant and are exercisable until the tenth anniversary of the award. Exercise of the award is subject to the employee remaining a full-time member of staff at the point of exercise and the vesting conditions being met.

Vesting conditions are based on a mixture of the company's TSR performance, relative to an appropriate comparator group, and certain individual performance criteria.

The fair value benefit is measured using a Black Scholes model, taking into account the terms and conditions upon which the share options were issued.

22. Share-based payment reserve continued

Group and Company

Year ended 31 December 2020

			Number					
Date of grant	Exercise period	Exercise price per share Pence	At 31 December 2019	Granted	Exercised	Non-vesting or lapsed	**At 31 December 2020**	Exercisable
11 May 2016	2019-2026	0.25	9,686	—	—	—	**9,686**	9,686
24 May 2017	2020-2027	0.25	110,817	—	—	(73,887)	**36,930**	36,930
26 October 2018	2021-2028	0.25	400,391	30,961	—	(373,390)	**57,962**	21,353
5 July 2019	2022-2029	0.25	538,596	—	—	(92,592)	**446,004**	—
			1,059,490	30,961	—	(539,869)	**550,582**	67,969
Weighted average exercise price of options (pence)			0.25	0.25	—	0.25	**0.25**	0.25

Year ended 31 December 2019

			Number					
Date of grant	Exercise period	Exercise price per share Pence	At 31 December 2018	Granted	Exercised	Non-vesting or lapsed	At 31 December 2019	Exercisable
11 May 2016	2019-2026	0.25	60,147	—	—	(50,461)	9,686	9,686
24 May 2017	2020-2027	0.25	240,406	—	—	(129,589)	110,817	—
26 October 2018	2021-2028	0.25	746,779	—	—	(346,388)	400,391	—
5 July 2019	2022-2029	0.25	—	538,596	—	—	538,596	—
			1,047,332	538,596	—	(526,438)	1,059,490	9,686
Weighted average exercise price of options (pence)			0.25	0.25	—	0.25	0.25	0.25

No share options had been exercised at the year-end (31 December 2019: Nil) and 67,969 (31 December 2019: 9,686) share options were exercisable at the year-end.

The following table lists the assumptions used in calculating the fair value of options:

Date of grant	Expected volatility	Risk-free interest rate	Dividend yield	Expected life of options	Weighted average exercise price	Weighted average share price at date of grant	Number of options Granted
11 May 2016	52.50%	1.40%	0.00%	3 years	0.25p	771p	60,147
24 May 2017	52.50%	0.41%	0.00%	3 years	0.25p	321p	240,406
26 October 2018	50.96%	0.72%	0.00%	3 years	0.25p	141p	746,779
5 July 2019	69.62%	0.57%	0.00%	3 years	0.25p	93p	538,596

The expected life of the options is based on historical data and is not necessarily indicative of exercise patterns that may occur. The expected volatility reflects the assumption that the historical volatility is indicative of future trends, which may also not necessarily be the actual outcome.

No dividends were assumed to be paid in the foreseeable future.

The model assumes, within the calculation of the charge, delivery of options that are dependent on a judgemental comparison to the total shareholder return against a specified comparator group of companies upon passing of the vesting period.

No other features of options granted were incorporated into the measurement of fair value.

22. Share-based payment reserve continued

Warrants

On 18 February 2020 the company issued 22,000,000 warrants to subscribers taking part in the issue of Ordinary shares on the basis of one warrant for every two Ordinary shares purchased. Each warrant entitles the holder to subscribe for one Ordinary Share at a price of 100p at any time up to the fifth anniversary of admission.

The fair value benefit is measured using a Black Scholes model, taking into account the terms and conditions upon which the share options were issued.

Group and Company

			Number					
Date of grant	Exercise period	Exercise price per share Pence	At 31 December 2019	Granted	Exercised	Non-vesting or lapsed	At 31 December 2020	Exercisable
18 February 2020	2020-2025	100.00	—	22,000,000	(75,693)	—	21,924,307	21,924,307
			—	22,000,000	(75,693)	—	21,924,307	21,924,307
Weighted average exercise price of options (pence)			—	100.00	100.00	—	100.00	100.00

75,693 warrants had been exercised at the year end and 21,924,307 warrants were exercisable at the year end.

The following table lists the assumptions used in calculating the fair value of Warrants:

Date of grant	Expected volatility	Risk-free interest rate	Dividend yield	Expected life of warrants	Weighted average exercise price	Weighted average share price at date of Admission	Number of Warrants Granted
18 February 2020	59.30%	0.46%	0.00%	5 years	100p	46p	22,000,000

The expected life of the warrants is based on historical share price data and is not necessarily indicative of exercise patterns that may occur. The expected volatility reflects the assumption that the historical volatility is indicative of future trends, which may also not necessarily be the actual outcome.

No dividends were assumed to be paid in the foreseeable future.

No other features of warrants granted were incorporated into the measurement of fair value.

23. Capital and reserves

The components of equity are as follows:

Called-up share capital

The share capital account includes the par value for all shares issued and outstanding.

Share premium account

The share premium account is used to record amounts received in excess of the nominal value of shares on issue of new shares less the costs of new share issues.

Merger reserve

The merger reserve comprises the premium arising on shares issued as consideration for the acquisition of subsidiary undertakings where merger relief under section 612 of the Companies Act 2006 applies.

Retained earnings

Retained earnings includes the accumulated profits and losses arising from the Group Statement of Comprehensive Income and certain items from other comprehensive income attributable to equity shareholders net of distributions to shareholders.

Other reserve

The other reserve represents the balance arising on the acquisition of the former non-controlling interest in 4D Pharma Research Limited.

Share-based payment reserve

The share-based payment reserve accumulates the corresponding credit entry in respect of share-based compensation charges. Movements in the reserve are disclosed in the Statements of Changes in Equity.

Translation reserve

The translation reserve is composed of the exchange rate movements in non-cash assets in for foreign subsidiaries which arise on the translation of foreign subsidiaries. Movements in the reserve are disclosed in the Statements of Changes in Equity.

24. Commitments

The Group had the following non-cancellable commitments at the date of the Statement of Financial Position:

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Short-term and low value leases (see note 19)	**81**	**—**	81	1
Committed capital expenditure	**—**	**—**	23	—
Research and development	**5,570**	**5,570**	11,304	11,304
Administrative expenses	**184**	**184**	941	941
	5,835	**5,754**	12,349	12,246

The maturity analysis of non-cancellable commitments is as follows:

	31 December 2020 Group £000	**31 December 2020 Company £000**	31 December 2019 Group £000	31 December 2019 Company £000
Short- term and low value leases (see note 19)				
– Not later than one year	**81**	**—**	81	1
– After one year but not more than five years	**—**	**—**	—	—
– Due in more than five years	**—**	**—**	—	—
	81	**—**	81	1
Committed capital expenditure				
– Not later than one year	**—**	**—**	23	—
– After one year but not more than five years	**—**	**—**	—	—
– Due in more than five years	**—**	**—**	—	—
	—	**—**	23	—
Research and development:				
– Not later than one year	**3,112**	**3,112**	6,937	6,937
– After one year but not more than five years	**2,458**	**2,458**	4,367	4,367
– Due in more than five years	**—**	**—**	—	—
	5,570	**5,570**	11,304	11,304
Administrative expenses				
- Not later than one year	**184**	**184**	416	416
- After one year but not more than five years	**—**	**—**	525	525
- Due in more than five years	**—**	**—**	—	—
	184	**184**	941	941
Total				
– Not later than one year	**3,377**	**3,296**	7,457	7,354
– After one year but not more than five years	**2,458**	**2,458**	4,892	4,892
– Due in more than five years	**—**	**—**	—	—
	5,835	**5,754**	12,349	12,246

25. Financial risk management

Overview

This note presents information about the Group's exposure to various kinds of financial risks, the Group's objectives, policies and processes for measuring and managing risk, and the Group's management of capital.

The Board of directors has overall responsibility for the establishment and oversight of the Group's risk management framework. The Executive directors report regularly to the Board on Group risk management.

It is, and has been throughout the year, the Group's policy that no speculative trading in financial instruments is undertaken.

Capital risk management

The Company reviews its forecast capital requirements on a rolling basis to ensure that entities in the Group will be able to continue as a going concern while maximising the return to stakeholders.

The capital structure of the Group consists of equity attributable to equity holders of the parent, comprising issued share capital, reserves and retained earnings as disclosed in note 23 and in the Group Statement of Changes in Equity. Total equity was £28.0 million at 31 December 2020 (31 December 2019: £22.3 million).

The Company is not subject to externally imposed capital requirements.

Liquidity risk

The Group's approach to managing liquidity is to ensure that, as far as possible, it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Group's reputation.

The Group manages all of its external bank relationships centrally in accordance with defined treasury policies. The policies include the minimum acceptable credit rating of relationship banks and financial transaction authority limits. Any material change to the Group's principal banking facility requires Board approval. The Group seeks to mitigate the risk of bank failure by ensuring that it maintains relationships with a number of investment grade banks.

At the reporting date the Group was cash positive with no outstanding borrowings.

	31 December 2020			
Categorisation of financial instruments	**Fixed rate £000**	**Floating rate £000**	**Non-interest bearing £000**	**Total £000**
Group				
Cash, cash equivalents and short-term deposits	**—**	**8,775**	**—**	**8,775**
Trade and other payables	**—**	**—**	**(6,379)**	**(6,379)**
Lease liabilities	**(1,059)**	**—**	**—**	**(1,059)**
	(1,059)	**8,775**	**(6,379)**	**1,337**
Company				
Cash, cash equivalents and short-term deposits	**—**	**6,213**	**—**	**6,213**
Loans to subsidiaries	**—**	**—**	**72,670**	**72,670**
Trade and other payables	**—**	**—**	**(3,575)**	**(3,575)**
Lease liabilities	**(753)**	**—**	**—**	**(753)**
	(753)	**6,213**	**69,095**	**74,555**

	31 December 2019			
Categorisation of financial instruments	Fixed rate £000	Floating rate £000	Non-interest bearing £000	Total £000
Group				
Cash, cash equivalents and short-term deposits	—	3,836	—	3,836
Trade and other payables	—	—	(6,192)	(6,192)
Lease liabilities	(1,111)	—	—	(1,111)
	(1,111)	3,836	(6,192)	(3,467)
Company				
Cash, cash equivalents and short-term deposits	—	2,921	—	2,921
Loans to subsidiaries	—	—	59,643	59,643
Trade and other payables	—	—	(1,840)	(1,840)
Lease liabilities	(786)	—	—	(786)
	(786)	2,921	57,803	59,938

All categories of financial assets and liabilities are measured at amortised cost with exception of the contingent consideration which is measured at fair value through the Statement of Total Comprehensive Income using a level 3 valuation technique. The values disclosed in the above table are carrying values. The Board considers that the carrying amount of financial assets and liabilities approximates to their fair value.

25. Financial risk management continued

Interest rate risk

As the Group has no significant borrowings the risk is limited to the reduction of interest received on cash surpluses held at bank which receive a floating rate of interest. The exposure to interest rate movements is immaterial.

Maturity profile

The directors consider that the carrying amount of the financial liabilities approximates to their fair value.

As all financial assets are expected to mature within the next twelve months an aged analysis of financial assets has not been presented.

Maturity of liabilities and cash outflows

	2020				2019			
Group	**Less than one year £000**	**Between one and two years £000**	**Between two and five years £000**	**More than five years £000**	Less than one year £000	Between one and two years £000	Between two and five years £000	More than five years £000
Trade and other payables	**6,379**	**—**	**—**	**—**	6,192	—	—	—
Lease liabilities	**73**	**76**	**413**	**497**	68	78	314	651
	6,452	**76**	**413**	**497**	6,260	78	314	651

	2020				2019			
Company	**Less than one year £000**	**Between one and two years £000**	**Between two and five years £000**	**More than five years £000**	Less than one year £000	Between one and two years £000	Between two and five years £000	More than five years £000
Trade and other payables	**3,575**	**—**	**—**	**—**	1,840	—	—	—
Lease liabilities	**37**	**38**	**248**	**430**	32	38	189	527
	3,612	**38**	**248**	**430**	1,872	38	189	527

Foreign currency risk

The Group's principal functional currency is sterling. However, the Group has two subsidiaries whose functional currency is the Euro and one subsidiary whose functional currency is the US Dollars. In addition, the Group as a whole undertakes certain transactions denominated in foreign currencies.

The Group is exposed to currency risk on sales and purchases that are denominated in a currency other than the respective functional currency of the Company. These are primarily US Dollars (USD), and Euros (EUR). Transactions outside of these currencies are limited.

The Group may use forward exchange contracts as an economic hedge against currency risk, where cash flow can be judged with reasonable certainty. Foreign exchange swaps and options may be used to hedge foreign currency receipts in the event that the timing of the receipt is less certain. There were no open forward contracts as at 31 December 2020 or at 31 December 2019 and the Group did not enter into any such contracts during these years.

The split of Group assets between Sterling and other currencies at the year-end is analysed as follows:

	2020				2019			
Group	**GBP £000**	**USD £000**	**EUR £000**	**Total £000**	GBP £000	USD £000	EUR £000	Total £000
Cash, cash equivalents and deposits	**4,199**	**3,484**	**1,092**	**8,775**	1,919	1,682	235	3,836
Trade and other payables	**(3,526)**	**(2,036)**	**(817)**	**(6,379)**	(5,151)	(187)	(854)	(6,192)
Lease liabilities	**(754)**	**—**	**(305)**	**(1,059)**	(786)	—	(325)	(1,111)
	(81)	**1,448**	**(30)**	**1,337**	(4,018)	1,495	(944)	(3,467)

Sensitivity analysis to movement in exchange rates

To understand the sensitivity to exchange rate fluctuations the Group has considered the effect on the net balances based on a 1 point and 5 point variation and has concluded that the impact is immaterial, the details are as follows:

	2020				2019			
Group	**GBP £000**	**USD £000**	**EUR £000**	**Total £000**	GBP £000	USD £000	EUR £000	Total £000
Exchange rate at 31 December	**1**	**1.36638**	**1.12022**		1	1.32594	1.18152	
5 point decrease	**(81)**	**1,397**	**(29)**	**1,287**	(4,018)	1,441	(906)	(3,483)
1 point decrease	**(81)**	**1,437**	**(30)**	**1,326**	(4,018)	1,484	(936)	(3,470)
At 31 December	**(81)**	**1,448**	**(30)**	**1,337**	(4,018)	1,495	(944)	(3,467)
1 point increase	**(81)**	**1,459**	**(30)**	**1,348**	(4,018)	1,506	(952)	(3,464)
5 point increase	**(81)**	**1,503**	**(31)**	**1,391**	(4,018)	1,554	(986)	(3,450)

26. Related party transactions

Key management compensation	**Year to 31 December 2020 £000**	Year to 31 December 2019 £000
Executive directors:		
Salaries and short-term benefits	**204**	204
Employer's national insurance and social security costs	**25**	25
	229	229
Fees for services provided as non-executive directors:		
Salaries and short-term benefits	**183**	167
Employer's national insurance and social security costs	**1**	5
	184	172
Other key management:		
Salaries and short-term benefits	**961**	1,333
Employer's national insurance and social security costs	**143**	200
Employers pension contributions	**24**	55
Share-based payment charge	**235**	267
	1,363	1,855

Group

Transactions with Directors, substantial shareholders and related entities

Interest in Shares and Warrants

During the year the Company undertook two capital raises through the issue of shares and warrants. Details of the Directors participation in these raises and other share acquisitions is as follows:

Executive Directors	Duncan Peyton CEO			Dr. Alex Stevenson CSO		
Shares and Warrants	Number of shares	Number of warrants	£	Number of shares	Number of warrants	£
At 1 January 2020	6,455,075	—		6,413,136	—	
Subscription on 18 February 2020 at £0.50 per share	1,333,332	666,666	666,666	1,333,332	666,666	666,666
Total at 18 February 2020	7,788,407	666,666	666,666	7,746,468	666,666	666,666
Subscription on 13 July 2020 at £0.35 per share	571,428	—	200,000	571,428	—	200,000
Total at 13 July 2020	8,359,835	666,666	866,666	8,317,896	666,666	866,666
Percentage of enlarged share capital at 13 July 2020	6.36%			6.33%		

Non-Executive Directors	David Norwood * NED			Prof. Axel Glasmacher NED		
Shares and Warrants	Number of shares	Number of warrants	£	Number of shares	Number of warrants	£
At 1 January 2020	7,123,725	—		—	—	
Subscription on 18 February 2020 at £0.50 per share	1,333,336	666,668	666,668	—	—	—
Total at 18 February 2020	8,457,061	666,668	666,668	—	—	—
Market based purchase 17 March 2020 at £0.28 per share	100,000	—	28,000	—	—	—
Subscription on 13 July 2020 at £0.35 per share	285,714	—	100,000	30,000	—	10,500
Total at 13 July 2020	8,842,775	666,668	794,668	30,000	—	10,500
Percentage of enlarged share capital at 13 July 2020	6.73%			0.02%		

* David Norwood resigned as a Director on 30 September 2020. As his shareholding was not sufficient for him to qualify as a substantial shareholder, transactions after this date have been excluded.

No warrants had been exercised by the existing Directors at 31 December 2020.

Further details of shares issued and proceeds from their issue can be found in note 21.

26. Related party transactions continued

Group continued

Merger with Longevity Acquisition Corporation

On 22 October 2020 the Company announced its intention to merge with Longevity Acquisition Corporation (Longevity), a Special Purpose Acquisition Company, and its intention to seek a NASDAQ listing.

To secure the merger a backstop agreement was put in place involving certain of the Directors and significant shareholders (the "Backstop Investors"). The details of the agreement at 31 December 2020 were as follows:

Backstop Arrangements and Related Party Transactions

The current Longevity shareholders have the right to redeem their shareholding in Longevity, even if the requisite majority of Longevity shareholders approve the merger. $14.6 million is currently held in a trust account by Longevity to fund redemptions. Any redemptions by Longevity shareholders would reduce the capital available to the enlarged group. Backstop agreements have therefore been executed by Longevity, the Company and Whale Management Corporation ("SPAC Sponsor") with certain investors, including Duncan Peyton and Alex Stevenson, (together the "Backstop Investors").

The Backstop Investors have committed to subscribe for Longevity shares prior to completion so as to raise up to $14.6 million in the event of redemptions by Longevity shareholders. To secure the Backstop Arrangements, Longevity has agreed to allot 700,000 Longevity shares to the Backstop Investors, Whale has agreed to transfer 200,000 Longevity Shares to the Backstop Investors, and the Company has agreed to allot up to 7,530,000 4D ordinary shares to the Backstop investors if and to the extent outstanding warrants issued by Longevity are exercised.

The Backstop arrangements also provide that, subject to certain conditions, 4D may be required to file, within thirty days after completion, a registration statement under the US Securities Act registering the resale of the 4D ordinary shares received by the Backstop Investors pursuant to the merger and the Backstop arrangements. The Backstop Investors have agreed to loan Longevity US$1.86 million, the proceeds of which will be used to repay Whale for loans previously made by Whale to Longevity to fund its launch costs. On completion, the enlarged group will repay this sum to the Backstop Investors.

Related Party Transactions

The participation by Duncan Peyton (in the amount of $1,075,862) and Alex Stevenson (in the amount of $827,856) in the Backstop arrangements constitutes a related party transaction for the purposes of the AIM Rules. In addition, Steve Oliveira and connected parties, a substantial shareholder of the Company (as defined by the AIM Rules) is participating in the Backstop arrangements in the amount of $5 million (in aggregate). The participation by Steve Oliveira and connected parties in the Backstop Arrangements also constitutes a related party transaction for the purposes of the AIM Rules.

The 4D Independent Directors, having consulted with the Company's nominated adviser, N+1 Singer, consider that the terms of the related party transactions are fair and reasonable insofar as Shareholders are concerned. In providing their advice to the 4D Independent Directors, N+1 Singer have taken into account the commercial assessments of the 4D Independent Directors.

Lock-up Agreements

Duncan Peyton and Alex Stevenson, being the Chief Executive Officer and Chief Scientific Officer respectively, will enter into lock-up agreements at completion. Under the terms of the lock-up agreement, each of Mr Peyton and Dr Stevenson will agree that, subject to certain limited exceptions, they will not sell any consideration shares due to them under the terms of the merger for a period of twelve months.

Transactions with key personnel and related entities

Biomar Microbial Technologies, an entity in which Antonio Fernandez is a director, charged rent and building service costs to the Group of £132,979 (31 December 2019: £40,348) and the Group charged Biomar £31,595 for services (31 December 2019: £27,583). At the year-end £2,880 was due from Biomar Microbial Technologies (31 December 2019: £2,844).

Transactions with substantial shareholders

Following the announcement of the merger, Steve Oliveira purchased shares in Longevity Acquisition Corporation. At 31 December 2020 his holding equated to 212,349 shares which constituted 8.12% of the outstanding share capital.

There were no further transactions with Directors, substantial shareholders and related entities with the Group during the current or previous year.

Company

Transactions between 100% owned Group companies have not been disclosed as these have all been eliminated in the preparation of the Group financial statements.

Transactions with Directors and related entities

All transactions with Directors and related entities are the same as listed above for the Group.

Transactions with key personnel and related entities

There were no transactions between the Company and key personnel and their related entities during the current and previous year.

27. Reconciliation of net cash flows to movement in net debt

	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Net debt at the beginning of the year	**(2,725)**	**(2,135)**	(23,876)	(21,324)
Cash flows	**(5,312)**	**(3,442)**	22,129	20,665
Non-cash items*	**18**	**—**	(1,204)	(1,511)
Interest and other finance costs	**303**	**117**	226	35
(Increase) / decrease in net debt in the year	**(4,991)**	**(3,325)**	21,151	19,189
Net debt at 31 December	**(7,716)**	**(5,460)**	(2,725)	(2,135)

* Non-cash items relate to the fair value movement of debt recognised in the year which do not give rise to a cash inflow or outflow.

Net debt is defined as follows:

	31 December 2020 Group £000	31 December 2020 Company £000	31 December 2019 Group £000	31 December 2019 Company £000
Current assets				
Cash and cash equivalents	**8,775**	**6,213**	3,836	2,921
Current liabilities				
Lease liabilities	**(73)**	**(37)**	(68)	(32)
Non-current liabilities				
Lease liabilities	**(986)**	**(716)**	(1,043)	(754)
Net Debt	**7,716**	**5,460**	2,725	2,135

Analysis of net debt

Group	31 December 2019 £000	Cash flows £000	Non-cash items £000	Interest and other finance costs £000	**31 December 2020 £000**
Short-term investments and cash on deposit	—	(5)	—	5	**—**
Cash and cash equivalents	3,836	4,939	—	—	**8,775**
	3,836	4,934	—	5	**8,775**
Liabilities arising from financing activities					
Lease liabilities	(1,111)	378	(18)	(308)	**(1,059)**
	(1,111)	378	(18)	(308)	**(1,059)**
Net debt	2,725	5,312	(18)	(303)	**7,716**

27. Reconciliation of net cash flows to movement in net debt continued

Analysis of net debt continued

Group	31 December 2018 £000	Cash flows £000	Non-cash items £000	Interest and other finance costs £000	31 December 2019 £000
Short-term investments and cash on deposit	10,174	(10,268)	—	94	—
Cash and cash equivalents	16,053	(12,217)	—	—	3,836
	26,227	(22,485)	—	94	3,836
Liabilities arising from financing activities					
Lease liabilities	(26)	356	(1,121)	(320)	(1,111)
Contingent consideration	(2,325)	—	2,325	—	—
	(2,351)	356	1,204	(320)	(1,111)
Net debt	23,876	(22,129)	1,204	(226)	2,725

Company	31 December 2019 £000	Cash flows £000	Non-cash items £000	Interest and other finance costs £000	**31 December 2020 £000**
Short-term investments and cash on deposit	—	(7)	—	7	**—**
Cash and cash equivalents	2,921	3,292	—	—	**6,213**
	2,921	3,285	—	7	**6,213**
Liabilities arising from financing activities					
Lease liabilities	(786)	157	—	(124)	**(753)**
	(786)	157	—	(124)	**(753)**
Net debt	2,135	3,442	—	(117)	5,460

Company	31 December 2018 £000	Cash flows £000	Non-cash items £000	Interest and other finance costs £000	31 December 2019 £000
Short-term investments and cash on deposit	10,174	(10,268)	—	94	—
Cash and cash equivalents	13,475	(10,554)	—	—	2,921
	23,649	(20,822)	—	94	2,921
Liabilities arising from financing activities					
Lease liabilities	—	157	(814)	(129)	(786)
Contingent consideration	(2,325)	—	2,325	—	—
	(2,325)	157	1,511	(129)	(786)
Net debt	21,324	(20,665)	1,511	(35)	2,135

28. Subsequent events

Merger with Longevity Acquisition Corporation

On 18 March 2021 (the "Closing Date"), the transaction (the "Closing") contemplated by the previously announced Merger Agreement and BVI Plan of Merger (the "Merger"), dated as of 21 October 2020 (as amended, the "Merger Agreement"), by and among Longevity Acquisition Company ("Longevity"), 4D Pharma plc ("4D Pharma"), and Dolphin Merger Sub Limited, a British Virgin Islands company and a wholly-owned subsidiary of 4D Pharma (the "Merger Sub"), and the other parties named therein, was approved and the transaction was completed on 22 March 2021. The Merger Sub is the surviving entity (the "Surviving Corporation"). As a result of the Merger, each Longevity share issued and outstanding immediately prior to the completion of the Merger was converted into the right to receive 7.5315 ordinary shares of 4D Pharma payable in 4D Pharma ADSs ("American Depositary Shares") at a rate equal to one 4D Pharma ADS for every eight 4D Pharma ordinary shares. 4D Pharma issued no fractional 4D Pharma Shares or 4D Pharma ADSs in the Merger. Each warrant to purchase Longevity Shares and right to receive Longevity Shares that was outstanding immediately prior to the Closing was assumed by 4D Pharma and automatically converted into a warrant to purchase ordinary shares of 4D Pharma and a right to receive ordinary shares of 4D Pharma, payable in 4D Pharma ADSs, respectively.

In connection with the Closing, certain holders of Longevity common shares exercised their right to redeem those shares in accordance with the Company's organisational documents, as amended, for cash at a price of approximately $11 per Ordinary Share, for an aggregate of approximately $3,000. Pursuant to a Backstop Agreement previously entered into between Longevity, 4D Pharma, Longevity's sponsor (Whale Capital Management the "Sponsor") and certain current shareholders of 4D Pharma and new investors (such current shareholders of 4D Pharma and new investors, collectively, the "Buyers"), the Buyers provided financial backing of approximately $14.7 million to Longevity immediately prior to the Closing, to cover against redemptions by Longevity Shareholders. In view of the de minimis redemptions, the backstop was not called upon The consideration paid to the Buyers pursuant to the Backstop Agreements consisted of 700,000 newly issued Ordinary Longevity Shares, the transfer by Longevity's sponsor of 200,000 outstanding Longevity Shares, the grant of an option to acquire up to an additional 400,000 outstanding Longevity Shares from the Sponsor, and the commitment by 4D Pharma to grant to the Buyers following the closing of the Merger warrants to acquire up to 1,000,000 Longevity shares (equivalent to 7,530,000 shares in 4D Pharma) for 0.25 pence per ordinary share. In connection with the Closing, and pursuant to the Merger Agreement, (a) an aggregate of 28,298,192 Ordinary shares were issued in 4D Pharma to Longevity shareholders and the Buyers, (b) 4D Pharma assumed Longevity warrants to acquire and rights to receive an aggregate of 16,268,040 ordinary shares in 4D Pharma, and (c) 2,750,000 shares of 4D Pharma were issued to a bank as an advisor fee.

At the Closing, 4D Pharma entered into a Lock-up Agreement with the Sponsor and certain shareholders of 4D. Pursuant to the Lock-Up Agreement, each holder agreed that, subject to certain exceptions, during the period ending twelve months after the Closing, it will not (i) lend, offer, pledge, hypothecate, encumber, donate, assign, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares received as consideration in the Merger (the "Restricted Securities"), (ii) enter into any swap, short sale, hedge or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the Restricted Securities, or (iii) publicly disclose the intention to effect any transaction specified in clause (i) or (ii), or (iv) make any demand for or exercise any right with respect to the registration of any Longevity Shares.

As Longevity has no ongoing trade or business, the Merger does not constitute a business combination under IFRS 3. As such the transaction will be treated as a financing through the issue of ordinary shares in 4D Pharma. At Closing, Longevity had approximately $14.8 million of cash in hand on completion equating to $11.6 million net of costs and will form part of the share capital and share premium accounts in 4D Pharma.

28. Subsequent events continued

NASDAQ Listing

On 22 March 2021, with the completion of the Longevity transaction, the Company completed its NASDAQ Global Market listing using American Depositary Shares (ADSs) under the ticker 'LBPS' and the following day the warrants began trading under the 'LBPSW' ticker. Ordinary shares can be converted at any time to ADSs at a ratio of eight ordinary shares for one ADS. J.P Morgan Chase bank, N.A. is acting as depositary bank for the ADSs and the Company's ordinary shares will continue to be admitted to trading on AIM under the ticker 'DDDD'.

Private Placement Financing

On 17 March 2021, the Company announced that it had entered into securities purchase agreements with certain US and UK institutional and accredited investors to raise approximately £17.29 million ($24.03 million) in gross proceeds through a private placement of 15,713,309 new ordinary shares of £0.0025 at a price of £1.10 ($1.53) per share. A further subscription for 654,023 ordinary shares was also made by Merck Sharpe & Dohme Corp. before admission to AIM on 23 March 2021 bringing the total subscription to 16,367,332 ordinary shares and gross proceeds of the placement to approximately £18.01 million ($25.03 million) gross or £16.87 million ($23.45 million) net of fees. In addition to the placement Duncan Peyton (Chief Executive Officer) and Alex Stevenson (Chief Scientific Officer) intend to subscribe for, in aggregate, £1.44 million ($2.0 million) of new ordinary shares at the issue price of £1.10 following the release of these financial results. Shares issued in the PIPE via ADSs will begin trading once the Securities and Exchange Commission declares the Company's resale registration statement effective related to those shares effective.

Overdraft Facility

In March 2021 4D Pharma Leon S.L.U. agreed a €1.0 million (£0.86 million) overdraft facility supported by the Spanish government as part of its COVID-19 relief package. The overdraft is unsecured, incurs annual interest at a rate of 2.35% and is repayable in full at the end of three years, further adding to the Group's available funding.

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