4D pharma plc

Transforming how diseases are treated

4D pharma plc
Annual Report and Accounts 2018

We are pioneers in harnessing bacteria as a novel and revolutionary class of medicines:

Live Biotherapeutics

What we do

We understand that bacteria in the human intestine – known as the gut microbiome – have an important function in many diseases.

Importantly, we understand *how* they function and how they could be used as a revolutionary new class of medicines known as Live Biotherapeutics.

Our deep understanding of bacterial functionality enables us to develop Live Biotherapeutics for a large number of diseases including cancer, gastrointestinal disease, respiratory disease and central nervous system ("CNS") disease.

What sets us apart

- We are targeting a new, safer approach to drug development
- We are a fully integrated microbiome company with the capability to progress from research to production to clinic
- We have a well established manufacturing facility capable of producing products for clinical trial supply and beyond
- We understand mechanism: how our products exert their therapeutic effects and act as a drug
- We have developed and wholly own the largest intellectual property estate in the field

LEARN MORE ABOUT WHAT WE DO
Pages 2 to 4

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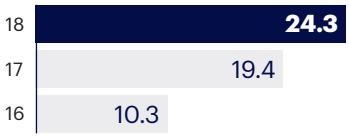
Highlights

Financial highlights

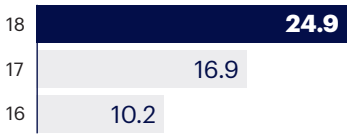
Total comprehensive loss after tax (£m)

£24.3m



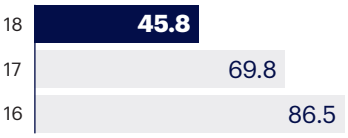
Expenditure on research and development (£m)

£24.9m



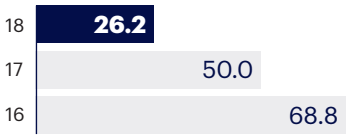
Total equity (£m)

£45.8m



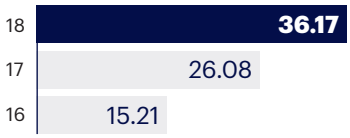
Cash, cash equivalents and cash on deposit (£m)

£26.2m



Adjusted loss per share* (pence)

36.17p



* Basic and diluted. Adjusted loss per share excludes non-recurring costs (see note 9).

Operational highlights

- Collaboration with Merck & Co. to evaluate MRx0518 in combination with Keytruda®
- Partnership with University of Texas MD Anderson Cancer Center
- Progression of the oncology portfolio into Phase I/II clinical studies
- Progression of clinical trials in gastrointestinal disease: successful completion of Phase Ib Thetanix® study in paediatric Crohn's disease and initiation of Phase II Blautix® study in IBS
- Progression in identifying the efficacy and mechanism of our core focus Live Biotherapeutics leading to significant publications
- Several publications addressing issues across the microbiome demonstrating 4D's research and development commitment to pushing forward the understanding of this technology
- Increased intellectual property portfolio with over 400 patents granted

READ ABOUT OUR BUSINESS MODEL
Pages 10 and 11

READ ABOUT OUR STRATEGY
Pages 10 and 11

4D pharma at a Glance

Poised for growth

4D pharma is pioneering a novel and disruptive new class of medicines – Live Biotherapeutics – which harness the extensive interactions between commensal bacteria and the human host that have co-evolved over millions of years. This revolutionary modality has the potential to transform drug development and the way we treat an ever wider range of diseases. We are leading the way in bringing Live Biotherapeutic Products to market across a broad range of indications.

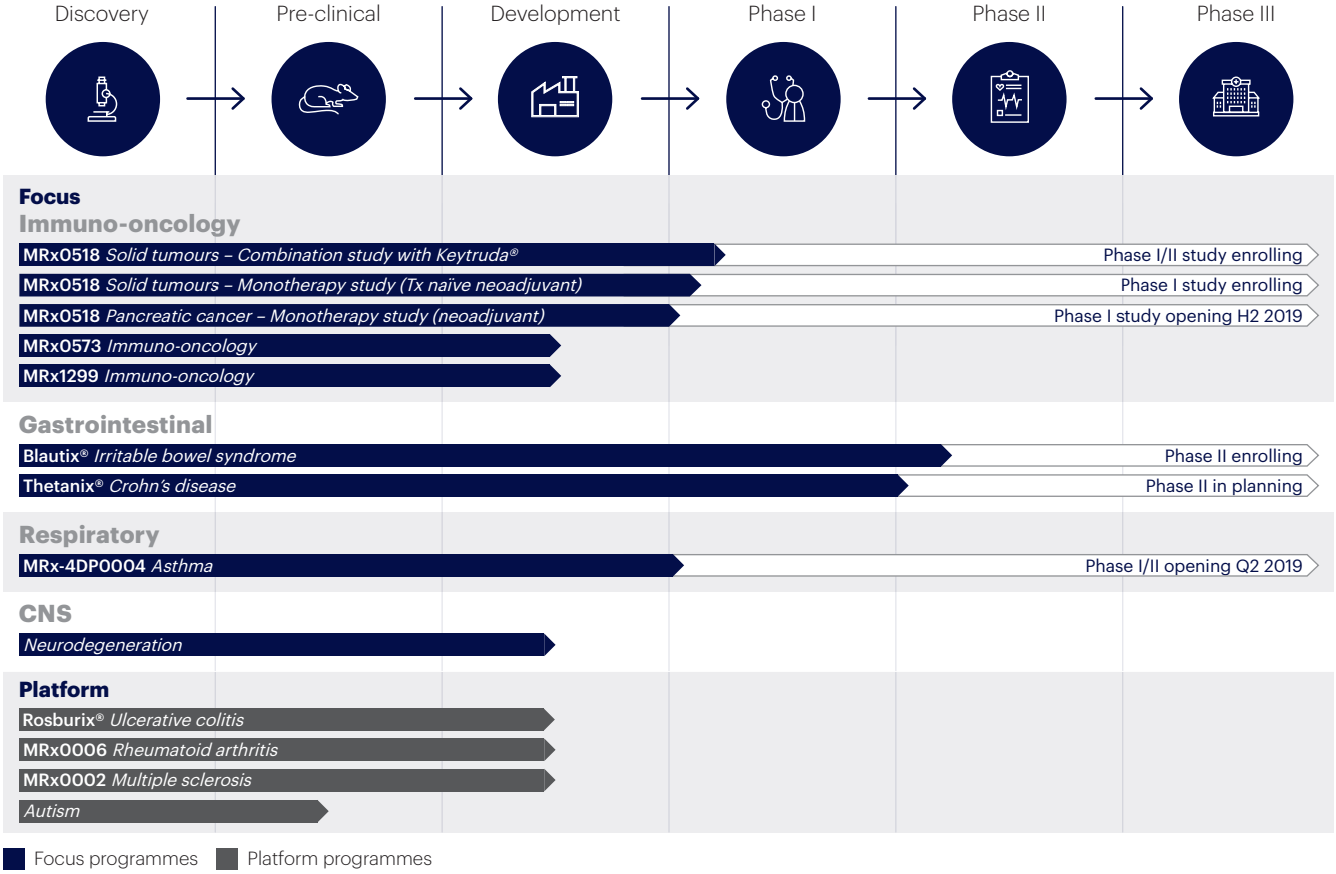
Because our Live Biotherapeutics are isolated from healthy individuals, they are expected to have exceptionally favourable safety profiles and very few adverse side effects. This significantly expedites the drug development process, allowing us to generate important clinical data much earlier in the product development cycle and ultimately bringing these products to patients more rapidly.

Our Live Biotherapeutics are single strain lyophilised commensal bacteria that are originally isolated from the gut of healthy humans and selected for their ability to modulate the host immune system. They are encapsulated to be delivered orally. Live Biotherapeutics are recognised by the regulatory agencies as a novel class of drug. As one of the pioneers in the field, 4D pharma has helped shape the regulatory landscape including the new European Pharmacopoeia quality standards on the manufacturing of Live Biotherapeutics effective April 2019.

Our development pipeline

An integrated biopharma company

We are an integrated drug development company, firmly positioned to deliver the data needed to bring Live Biotherapeutics to market.



Developing science

Form follows bacterial function

Understanding bacterial function – the way in which the bacterial gene products interact with the human body – is of key importance in the discovery and development of Live Biotherapeutics and is the cornerstone of our approach. Using our MicroRx® platform, we can interrogate our proprietary library of bacterial strains for specific functionality that is relevant to a disease of interest. This deep mechanistic understanding is important to select the most potent candidates for development and to deliver the most effective therapies for patients. In 2018 we published a number of research papers in peer reviewed journals, delving into the mechanism of action of multiple programmes by identifying bacterial effector molecules and downstream signalling pathways.

MicroRx® platform

Our MicroRx® platform drives candidate discovery and development and is the most productive in the microbiome space. We use MicroRx® to interrogate our extensive library of bacterial isolates to identify Live Biotherapeutic candidates for a given disease based on a deep understanding of functionality and mechanism.

Using cutting-edge techniques from microbiology, immunology and bioinformatics, the platform identifies Live Biotherapeutic candidates based on the following paradigm:

- high throughput and targeted host response assays to identify pathway-specific effects on the host immune system;
- profiling and characterisation of bacterial effector molecules using an integrated multi-omics approach;
- interrogation of strain level functional differences which are vital in selecting the most potent candidates for clinical development; and
- early integration of scale-up and product development.

We believe that we can use the MicroRx® platform to drive forward programmes in other areas, many of which may be of interest to pharmaceutical partners.

Publications

Our research continues to expand the understanding of the role of Live Biotherapeutics in multiple diseases. In the last twelve months we have published a number of key papers.

- The flagellin of candidate live biotherapeutic *Enterococcus gallinarum* MRx0518 is a potent immunostimulant. Lauté-Caly, et al. Scientific Reports 2019.
- *Bifidobacterium breve* MRx0004 protects against airway inflammation in a severe asthma model by suppressing both neutrophil and eosinophil lung infiltration. Raftis, et al. Scientific Reports 2018.
- *Bacteroides thetaiotaomicron* ameliorates colon inflammation in preclinical models of Crohn's disease. Delday M., et al. Inflammatory Bowel Diseases 2018.
- Human gut bacteria as potent class I histone deacetylase inhibitors *in vitro* through production of butyric acid and valeric acid. Yuille S., et al. PLOS ONE 2018.

Beyond the gut

Our Live Biotherapeutics have potent immunomodulatory effects which can manifest at sites anatomically distant from the gastrointestinal tract. This allows us to use our Live Biotherapeutics to target a broad range of diseases with high unmet need. Our sector-leading pipeline contains a suite of programmes across oncology, gastrointestinal and respiratory disease and neurodegeneration.

The microbiome in immuno-oncology

Over the past few years the gut microbiome has emerged as a next-generation target in the development of new therapies across a range of cancer settings. For example, the gut microbiome has been shown to significantly affect a patient's response to checkpoint inhibitors.

The influence of the microbiome in cancer is not limited to improving the efficacy of checkpoint inhibitors. The effect on response to commonly used chemotherapy agents for solid tumours such as cyclophosphamide and platinum salts has also been demonstrated. The microbiome also has protective effects against certain side-effects of cancer treatments, as well as significantly affecting outcomes following treatment for lymphoma.

As one of the first microbiome companies to develop Live Biotherapeutics for the treatment of cancer, as a monotherapy and as a combination therapy, oncology remains a strategic priority for us. During 2018 we have made substantial progress on multiple fronts.

4D pharma at a Glance continued

Delivering therapies

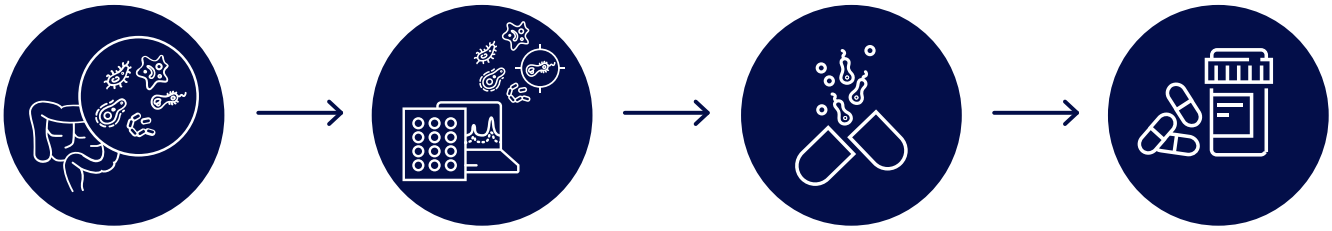
We are able to progress our Live Biotherapeutic candidates into the clinic quickly because we have "end-to-end" capabilities from discovery to the clinic through our Research and Development, Chemistry, Manufacturing and Controls ("CMC") and Clinical teams. 4D recognised the limitations of contract manufacturing facilities early on and has a dedicated GMP-certified manufacturing facility. We have the capacity to produce sufficient capsules of clinical product per year for our clinical programmes and beyond.

2018 has been a significant year for 4D pharma's clinical development activities, translating world-leading research into clinical stage therapeutic candidates. Our focus programmes include immuno-oncology, gastrointestinal disease, respiratory disease and central nervous system ("CNS") disorders and we will prioritise these products as we accelerate through development.

Our Phase Ib study of Thetanix® in paediatric Crohn's disease met the primary outcome of demonstrating safety and tolerability. These early results further support one of our core tenets, that commensal bacteria isolated from healthy individuals will be safe and well tolerated in the clinic.

In November we commenced a large, multicentre Phase II study of Blautix® in patients with constipation-predominant and diarrhoea-predominant IBS (IBS-C and IBS-D). This study will enrol up to 500 patients and is the largest trial of a Live Biotherapeutic to date.

Throughout the year we have made significant progress with our lead oncology candidate, MRx0518. In addition to significant discoveries regarding the mechanism and potential effector molecules involved we received regulatory approvals to commence two clinical studies to evaluate MRx0518 in patients with solid tumours. The first of these is a Phase I/II combination study of MRx0518 and Keytruda® in patients with lung, skin, bladder and kidney cancer, undertaken as part of our clinical collaboration with Merck & Co. The study commenced in early January 2019 at the MD Anderson Cancer Center. The second is a Phase I trial of MRx0518 in the neoadjuvant setting as a monotherapy in treatment-naïve patients with solid tumours. This study has now commenced at Imperial College London.



Chairman's Statement

2018 has been an exciting year for 4D

As a leader in the microbiome medicine space with proof of concept clinical studies due to read out in the coming 12 to 18 months, 4D is well placed to deliver on the promise of this exciting new area in disease modification.

Performance

Since our last report, 4D has made significant progress taking its Live Biotherapeutic Products through the clinic in oncology, gastrointestinal and respiratory disease. We now have four products in clinical development with two studies ongoing in oncology, two in gastrointestinal disease and another in respiratory disease. The speed at which 4D has been able to enter clinical development is a reflection of the reduced preclinical work necessary to take single-strain Live Biotherapeutics into the clinic.

As we move forward, our key goal is to deliver meaningful clinical data to support the use of Live Biotherapeutics across multiple indications in oncology, gastrointestinal, respiratory and central nervous system diseases. I believe that through our ongoing programme of clinical trials, we are well positioned to achieve this.

Our research teams continue to further the understanding, both of our programmes and their mechanisms, and of the microbiome generally. Meanwhile our increasing intellectual property estate helps secure our leading position in the field.

Our culture

The success of 4D is based on close collaboration between the teams involved in all aspects of the business from discovery to manufacturing and beyond. We could not have achieved what we have without the continued support of our staff throughout our sites in Europe and those involved in our wider collaborations. I would like to thank them all for their contribution to the progress we have made in 2018.

Board and governance

We were delighted to appoint Ed Baracchini, PhD, and Professor Axel Glasmacher, MD, as independent Non-Executive Directors in January 2019. We are already seeing benefits from their advice in terms of commercial and clinical development.

The Board is committed to maintaining high standards of governance, both at Board level and operationally throughout the business. The Group's Corporate Governance Statement can be found on pages 18 to 21.

Outlook

2018 has been an exciting year for 4D with numerous clinical goals achieved. I look forward to the coming year and beyond with great anticipation as we prepare for clinical readouts that could revolutionise our quest to make microbiome medicines a reality for patients.

David Norwood
Non-Executive Chairman
20 May 2019

Chief Executive Officer's Report

In 2018, 4D has made considerable progress towards its goal of delivering Live Biotherapeutics as safe and effective therapies

Building towards our goal of delivering Live Biotherapeutics to the market, 2018 has been an important year for 4D pharma.

We continue to focus our attention on our oncology portfolio and expand our footprint in the US, having struck partnerships with Merck & Co., Inc. (known as MSD outside the United States and Canada) and MD Anderson Cancer Center to develop our Live Biotherapeutics in the field of oncology. Our collaboration with Merck & Co. advances the clinical development of MRx0518, combining it with the world-leading oncology product, whilst also providing further validation of our capabilities. Our strategic collaboration with MD Anderson Cancer Center will provide a long-term platform to evaluate our Live Biotherapeutics across a range of clinical cancer settings with some of the world's leading clinicians in this field.

We have maintained our clinical and regulatory progress throughout the year. Having received regulatory clearance from the FDA, MHRA and HPRA in November 2018 we commenced a large Phase II study of Blautix® in patients with IBS, further demonstrating our commitment to generating the robust clinical data required to support the approval of our products. This is not only an important trial for 4D but also for the microbiome medicine space being the largest trial in the space and is designed to deliver statistically significant data.

Research

We have always believed in the importance of understanding the mechanism and identifying the effector molecules of our products in the same way that is done with more traditional drug candidates. The continued effort by our research teams has generated further data supporting our functionality approach helping 4D define the field and identify novel ways forward. This not only gives us a leading edge in the field but also translates into more straightforward interactions with clinicians, regulators and the broader pharmaceutical industry.

Over the past twelve months the Group has continued work on expanding the use of the MicroRx® platform to further understand the mechanism of action of the Live Biotherapeutic Products in the product pipeline. This has led to the successful publication of a number of papers in peer-reviewed scientific journals. The insights provided are proving vital to decisions about the optimal clinical pathway for our products and in ongoing discussions with regulatory bodies and potential collaborators.

The expansion of MicroRx® has also allowed 4D to explore business development opportunities beyond the core focus programmes in oncology, gastrointestinal disease, respiratory disease and CNS disease and we anticipate that this will lead to further partnering opportunities in the coming year.

Oncology

We were delighted to announce our agreement with Merck & Co. in June to conduct a clinical study evaluating the combination of Keytruda® (pembrolizumab), an anti-PD-1 therapy, and MRx0518 in patients with solid tumours. The Phase I/II study is evaluating safety, tolerability and anti-tumour effect in patients with advanced cancers who have progressed on prior anti-PD-1 therapy. The study opened in early January and recruitment is ongoing at the MD Anderson Cancer Center where the study is taking place.

A second clinical study, a randomised, placebo-controlled Phase Ib study of MRx0518 as a monotherapy in a neoadjuvant setting for patients due to undergo surgery as a first treatment for solid tumours, is also ongoing. This study is taking place in the UK at Imperial College London and will assess the safety, tolerability and anti-cancer effects of MRx0518. These patients will receive MRx0518 as a neoadjuvant for two to four weeks prior to surgery. As participants will be treatment naïve, the study allows an unambiguous assessment of the anti-tumour immunological effects of MRx0518 in a clinical setting.

Throughout the year we have continued our work identifying the mechanism of action of our lead candidate, MRx0518. We published a key paper in January 2019, which outlines the role of the bacterial flagellin in stimulating the immune system.

In light of the focus on oncology, 4D has sought to engage with the best partners in the field as we progress our programmes through the clinic. In January 2018 we formally announced our strategic collaboration with the University of Texas MD Anderson Cancer Center which we have been working with through 2018. The alliance brings together MD Anderson's translational medicine and clinical research capabilities with 4D's expertise in the discovery and development of Live Biotherapeutics ("LBPs"). The collaboration will evaluate our LBP oncology pipeline across a range of cancer settings, including pancreatic cancer with a near-term focus on MRx0518.

READ OUR CASE STUDY
Page 8

Gastrointestinal disease

Our lead product in gastrointestinal disease, Blautix®, for IBS has made significant progress. We secured regulatory approvals in both the US and EU to commence our Phase II study of Blautix® in moderate to severe constipation-predominant IBS and diarrhoea-predominant IBS. This Phase II randomised, double-blind, placebo-controlled, multicentre study is now enrolling and will recruit up to 500 participants at sites across the US and EU. We believe that this study represents the largest clinical trial of a Live Biotherapeutic to date. It should be noted that the primary endpoint, overall response rate, is an FDA-approved endpoint for the registration of new IBS products.

READ OUR CASE STUDY
Page 8

During 2018 we also completed the Phase Ib study of Thetanix®, our product for Crohn's disease. This study in paediatric patients successfully met the primary outcomes of safety and tolerability and demonstrated results that match to the preclinical data.

Building on the data from the Phase I study we have been consulting with leading figures in the field and it has become clear that the need for a safe and effective solution in the paediatric population is growing in importance.

READ OUR CASE STUDY
Page 9

Respiratory disease

We have significantly advanced our asthma programme this year and received regulatory approval for our Phase I/II placebo-controlled study in poorly controlled asthma from the UK's MHRA in December. This study will primarily evaluate the safety and tolerability of MRx-4DP0004 in combination with existing maintenance therapy and has a range of secondary endpoints designed to evaluate efficacy. Further regulatory submissions are ongoing in the EU and US and we anticipate commencing the study in these territories shortly.

As with all our LBP programmes we have also focussed on furthering understanding the function and potential mechanism of our candidate. To this end in August we published a paper demonstrating the activity of MRx-4DP0004 in preclinical models of severe asthma. MRx-4DP0004 protects against airway inflammation by reducing both neutrophilic and eosinophilic infiltration concurrently as this is something that is not achievable with current therapies. This gives us further confidence that 4D has the capabilities to develop novel therapies for complex diseases.

Intellectual property

Since its inception, 4D has sought to establish a sector-leading IP portfolio robustly protecting its candidate therapies. By implementing an aggressive approach to securing patent protection, supported by first class science, 4D now has the largest and most comprehensive IP portfolio in the Live Biotherapeutics space with over 400 granted patents across over 50 patent families. Statutory exclusions to the patentability of naturally occurring matter, perceived by some to preclude meaningful patent protection for LBPs, have not constituted a barrier to 4D. All candidates in clinical development are protected by granted patents in the US, Europe and Japan with pending applications in all other significant jurisdictions.

Financial summary

In the year to December 2018, our cash and cash equivalents and short-term deposits reduced from £50.0 million to £26.2 million, with a loss before tax of £28.4 million (compared with £24.0 million in the year to December 2017). Our claim for research and development tax credit was £4.7 million (compared with £3.5 million in the year to December 2017).

Our cash burn for the year was in line with expectation, reflecting the increased costs of taking existing and new clinical programmes forward and preparing for upcoming Phase I and II trials.

The Group continues to manage its cash deposits prudently and invests its funds across a number of financial institutions which have investment grade credit ratings. The Board has continued to operate a robust set of financial controls including rolling short-term and long-term forecasts to assist in the control and prioritisation of resources.

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 the fourth quarter of 2019. The Directors are continuing to explore sources of finance available to the Group and have a reasonable expectation that they will be able to secure sufficient cash inflows into the Group to continue its activities for not less than twelve months from the date of approval of these accounts. They have therefore prepared the financial statements on a going concern basis.

Because the additional finance is not committed at the date of approval of these financial statements, these circumstances represent an uncertainty as to the Group's ability to continue as a going concern.

Should the Group be unable to obtain further finance such that the going concern basis of preparation was no longer appropriate, adjustments would be required including to reduce the carrying value of assets to their recoverable amounts, and to provide for future liabilities that may arise.

Outlook

Throughout 2018, 4D made significant progress towards its goal of producing Live Biotherapeutics as safe and effective therapies. 4D, at the forefront of this revolutionary field, is well positioned to deliver positive clinical results to establish confidence in the potential of this new class of medicines. Over the next 12 to 24 months, the Group will lead the way in generating robust clinical data to support the use of this new class of drugs across indications including oncology, gastrointestinal and respiratory disease. Our research programme and the progression of the MicroRx® platform continue to advance our understanding as we continue developing our novel Live Biotherapeutics at the forefront of this revolutionary field.

Duncan Peyton
Chief Executive Officer
20 May 2019

Portfolio Case Studies

Oncology – MRx0518

Live Biotherapeutics have the potential to treat a range of cancers as both monotherapies and in combination with existing treatments.

Overview

Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. It is estimated that there were 18 million new cases in 2018 and almost 10 million people died of cancer, making it the leading cause of death world-wide.

There is a clear unmet need as not all patients respond to current therapies and the side effects of many regimens are highly unpleasant.

Mechanism of action and preclinical efficacy

Our lead oncology candidate, MRx0518, has a strong immunostimulatory profile, acting on both the innate and adaptive immune systems of the host to induce an anti-tumour response. We have observed efficacy across a range of preclinical models of cancer, both as a monotherapy and in combination with existing immunotherapies.

Clinical studies

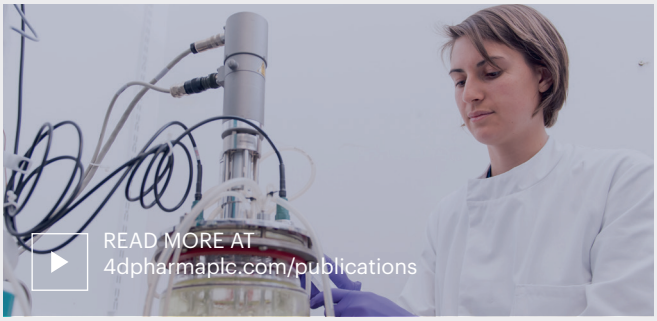
4D pharma is exploring the use of MRx0518 in both monotherapy and combination therapy settings.

In collaboration with Merck & Co. MRx0518 is being evaluated in an open label Phase I/II study in combination with Keytruda®. The study will enrol 132 participants with advanced or metastatic non-small cell lung cancer, renal cell carcinoma, bladder cancer or melanoma who have failed prior anti-PD-1 therapy. It will evaluate the safety, tolerability and preliminary clinical benefit of the combination of MRx0518 and Keytruda® and is taking place at the MD Anderson Cancer Center, US.

A second study of MRx0518 as a monotherapy for solid tumours commenced in April 2019. This Phase I randomised, placebo-controlled study will assess the safety, tolerability and anti-cancer effects in participants with solid tumours prior to surgical removal of the tumour. Patients will be treatment-naïve which enables the assessment of the anti-tumour effects of MRx0518 in the clinical setting and will guide future clinical development.

Irritable bowel syndrome – Blautix®

Despite available therapies, IBS remains difficult to treat with existing drugs only being effective in 30–40% of patients.



Overview

Irritable bowel syndrome ("IBS") is a common condition that affects the digestive system and can be classified as either diarrhoea-predominant ("IBS-D"), constipation-predominant ("IBS-C") or mixed ("IBS-M"). The primary symptoms of IBS are abdominal pain or discomfort in association with frequent diarrhoea or constipation and a change in bowel habits.

Patients with IBS have a microbiome which is less stable and less diverse than healthy individuals. We have demonstrated that this reduction in diversity is consistent across all subtypes of IBS (C, D and M) and that these subtypes have microbiota profiles which are statistically indistinguishable.

With current treatments only effective in 30–40% of patients and focussing on the symptoms of the condition, not its underlying causes, there is a clear market need.

Mechanism of action and preclinical efficacy

Blautix® consumes hydrogen and leads to the production of acetate which leads to an increase in microbiome diversity.

A Phase Ib double-blind, placebo-controlled clinical study of Blautix® in 48 people (24 with IBS symptoms, 24 without IBS symptoms with 2:1 randomisation to Blautix®/placebo) has been successfully completed.

No safety or tolerability signals were seen for Blautix® in this Phase Ib study, with 82% patients on Blautix® treatment seeing an overall improvement in symptoms vs 50% patients on placebo treatment. Treatment with Blautix® also led to an increase in microbiome diversity and stability.

Clinical studies

A Phase II randomised, double-blind, placebo-controlled, multicentre study of Blautix® is currently taking place. The study will recruit up to 500 participants at sites across the US and EU and represents the largest study of a Live Biotherapeutic in any disease. The study will evaluate the efficacy and safety of Blautix® in adults with moderate to severe IBS-C and IBS-D. 4D consulted with the FDA on the design of the study, the primary endpoints of which are those used in the registration of IBS products.

Asthma – MRx-4DP0004

There is a growing body of evidence linking the gut microbiome to the development of asthma.

Overview

Asthma is an inflammatory disease of the lungs characterised by recurring symptoms, reversible airflow obstruction and bronchospasm. Between 5–10% of asthma patients have the severe form of the disease, which is refractory to steroid treatment, cannot be controlled with high-intensity treatments and accounts for more than 50% of asthma-associated healthcare costs.

In severe asthma, airway inflammation can be predominantly eosinophilic, neutrophilic or mixed. Whilst a number of biologics have recently been approved to treat patients with eosinophilic disease, there are currently no approved therapies for patients who present with a neutrophilic phenotype.

Mechanism of action and preclinical efficacy

MRx-4DP0004 has demonstrated strong and significant efficacy in industry-standard preclinical models of steroid-resistant severe asthma. It was shown to reduce both neutrophils and eosinophils in both prophylactic and therapeutic settings. Notably, MRx-4DP0004 outperformed the anti-IL-17 positive control in this model and was able to reduce airway neutrophils and eosinophils concurrently, which is not possible with existing therapeutics. Raftis, et al. 2018. In addition to standard maintenance therapy such as inhaled corticosteroids ("ICS") and long-acting beta agonists ("LABA"), MRx-4DP0004 may provide benefits to patients with only partly controlled asthma.

Clinical studies

A Phase I/II randomised, double-blind clinical study in patients with partly controlled eosinophilic, neutrophilic or mixed asthma will open in 2019.

The study will assess the safety and tolerability of MRx-4DP0004 in combination with long-term maintenance therapies (ICS and LABA). Endpoints include reduction of asthma symptoms compared to placebo, sputum eosinophil and neutrophil cell counts, achievement of good asthma control and changes in the microbiome.

Crohn's disease – Thetanix®

There is a clear unmet need for a therapy suitable for the paediatric population.

Overview

Crohn's disease is a chronic inflammatory bowel disease ("IBD") which can occur in any part of the gastrointestinal tract, but primarily affects the small intestine. Many patients require long-term medical therapy, are repeatedly hospitalised and may require surgical intervention.

Thetanix® has orphan drug designation for paediatric Crohn's disease, an area of high unmet need as it can impair development. Standard therapies are often considered too aggressive for use in children. Patients are typically treated with long-term immunosuppressants, which are not effective in all individuals and are associated with undesirable side effects.

Mechanism of action and preclinical efficacy

Thetanix® acts upstream of many biologics approved for Crohn's disease and inhibits NF-κB activation which has been found to be overactive in many inflammatory diseases. A pirin-like protein ("PLP") produced by the bacteria has been identified as a candidate effector molecule.

In preclinical models of IBD Thetanix® has demonstrated a significant reduction of intestinal inflammation, protection against weight loss and prevention of histopathological changes in the colon.

Clinical studies

In a recent Phase Ib study in paediatric patients with Crohn's disease, Thetanix® was well tolerated with a good safety profile.

The randomised, double-blind, placebo-controlled study was conducted in two parts, a single-dose phase and a multiple-dose phase and treated a total of 18 subjects aged 16–18 with Crohn's disease.

In the single-dose phase, eight subjects were given a single dose of either Thetanix® or placebo. In the multiple-dose phase, ten subjects were given either Thetanix® or placebo twice daily for seven consecutive days.

A Phase II proof-of-concept study in paediatric Crohn's disease is in planning.

Our Business Model and Strategy

Developing science, delivering therapies

Our strategic priorities

1

World-leading research

Description

4D is committed to leading research into understanding the functionality of Live Biotherapeutics and the mechanisms by which they affect host biology and influence disease. This approach allows us to select the most potent Live Biotherapeutics for clinical development.

Performance

We mine our bacterial library using our proprietary discovery platform MicroRx® to identify Live Biotherapeutics ("LBPs") that show therapeutic effect, with defined functional mechanisms of action applicable to target indications. Microbiome medicines can be effective beyond the gut and, using MicroRx®, we have developed one of the broadest pipelines in the microbiome space. Since our last report we have published four papers in peer-reviewed journals, three around the mechanism of action and preclinical efficacy of MRx0518 (2) and MRx-4DP0004 (1) and also a paper about the potential of Live Biotherapeutics to serve as HDAC inhibitors.

Looking ahead

Our focus programmes revolve around four disease areas. These are oncology, gastrointestinal disease, respiratory disease and central nervous system disease. Our key focus over the next 12 to 18 months will be expanding the research behind the oncology and CNS disease franchises to continue to drive the clinical development of these assets and expand the list of indications. We will also expand the MicroRx® platform into new areas that are of interest to potential partners.

2

Rapid cost-effective development

Description

4D dramatically reduces the development timelines of its programmes by reference to traditional pharma, establishing accelerated development processes for its Live Biotherapeutics through the MicroRx® platform.

We have long recognised the need to address and control manufacturing and delivery issues to ensure against any loss of flexibility and pace of development and maintain speed into and through the clinic.

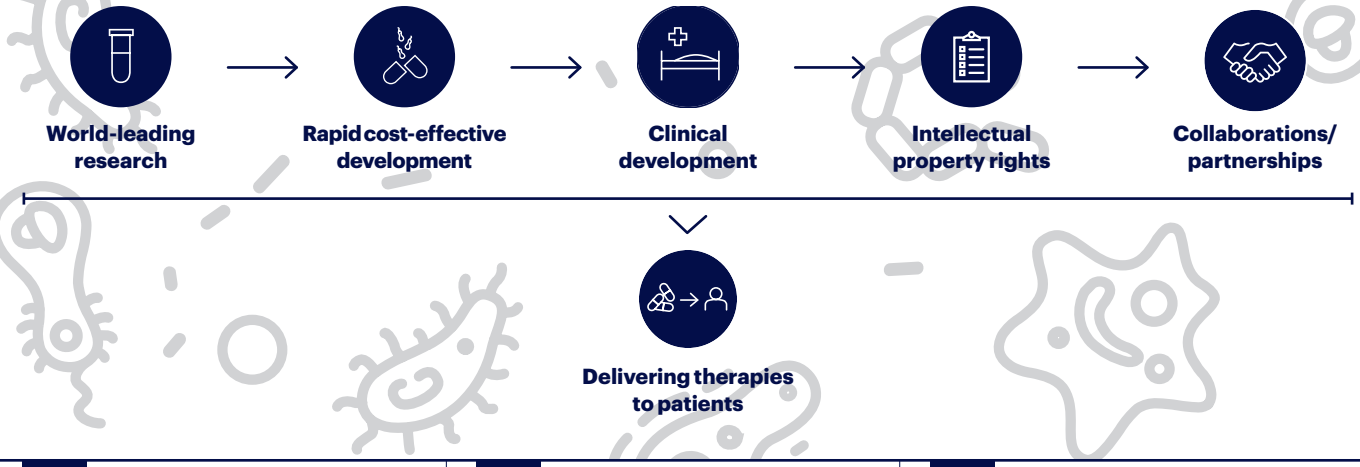
Performance

By bringing manufacturing in house for current and pending clinical programmes we are continually expanding and refining proprietary know-how key to the development of Live Biotherapeutics.

4D exploits the enhanced safety profiles of single strain commensal Live Biotherapeutics. This expedites time into the clinic. Since our last report we have completed the necessary development work to take MRx-4DP0004 into the clinic and have increased production of MRx0518 to cope with the new clinical studies.

Looking ahead

We will continue to leverage every element of the development process, and mine clinically relevant data to allow us to maintain our rapid entry times into the clinical sphere. We anticipate taking new strains of bacteria through the development process over the next 12 to 18 months.



3

Clinical development

Description

4D has sought to take its Live Biotherapeutics into and through clinical development as fast as possible. As the microbiome space matures the availability of robust clinical data is essential and we are dedicated to producing such data.

Performance

Our expanded clinical team ensures that we can optimise translation into and through the clinic. Robust data relies on clinical trial designs with sufficient statistical power (i.e. quantity of patients treated). Our ongoing trials are all designed with this aim. Our leading gastrointestinal product, Blautix® for IBS, entered Phase II this year and our preliminary Phase Ib study of Thetanix® in paediatric Crohn's disease produced encouraging results allowing us to plan for the next study in this area of unmet need. Two studies in oncology have commenced – a Phase I/II study of MRx0518 in combination with a PD-1 inhibitor (Merck & Co.'s Keytruda®) and a further study of MRx0518 in a neoadjuvant setting as a monotherapy in patients with solid tumours. A Phase I/II study in asthma is also expected to commence shortly.

Looking ahead

Going forward we intend to expand and continue our clinical studies in our focus areas. As our products progress through the clinic resources will be dedicated to expediting clinical progress wherever possible. We anticipate expanding the number of clinical settings in which we evaluate our oncology candidate, MRx0518, in order to extend the potential market for this product.

4

Intellectual property rights

Description

4D has identified the importance of establishing a sector-leading IP portfolio robustly protecting its candidate therapies. This is to maximise return on the investment made in our preclinical and clinical development focus programmes, to ensure that we are in the strongest possible position in the event of future patent disputes, to maximise the value of our platform assets and to enable us to share the advances we have made among the scientific community.

Performance

By implementing an aggressive approach to securing patent protection, backed up by first class science, 4D now has the most comprehensive IP portfolio and the most granted patents of all LBP-focussed companies; we hold in excess of 50 patent families and over 400 granted patents.

The IP portfolio provides multi-tiered protection for all focus and platform programmes as well as supplementary advances including bacterial components having therapeutic value, process technology innovations and bioinformatic advances made by the MicroDx® platform. Having protected these advances with patent filings, our scientists are now able to present our ground-breaking advances at sector-leading conferences and in high-impact journals.

Looking ahead

As more players enter the microbiome space, it is essential that we continue to robustly protect the innovations that we make in order to maintain our competitive edge. We will continue to protect newly identified therapeutic bacteria (or products thereof) as well as pursue patents for supplementary inventions made during development of our more mature assets, particularly our focus programmes.

5

Collaborations/partnerships

Description

Collaborations and partnerships are key to our long-term success. These include long-term collaborations with world-leading academic and clinical institutions as well as large pharmaceutical companies.

Performance

During the year we have entered into several strategic collaborations. We partnered with Merck & Co. to evaluate the combination of MRx0518 and Keytruda® (pembrolizumab) thus combining 4D's expertise in the development of Live Biotherapeutics and Merck's leading oncology capabilities.

We also entered into a strategic alliance with the University of Texas MD Anderson Cancer Center. Our partnership with the MD Anderson Cancer Center brings together MD Anderson's translational medicine and clinical research capabilities with 4D's expertise in the discovery and development of Live Biotherapeutics.

Looking ahead

Over the coming 12 to 18 months we will leverage such collaborations to expedite the progression of pipeline products. The MicroRx® platform offers multiple opportunities for the investigation and development of new therapeutic areas that are not focus diseases for 4D via collaborations.

Our Key Performance Indicators

Measuring our performance

We track a series of metrics focussed 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 monitor these metrics as an indicator of how the Group is progressing towards the goal of advancing its focus Live Biotherapeutic programmes through clinical development.

Since our 2017 report there have been significant advances, so we have altered the metrics to reflect this and the ongoing strategy. For example, we have removed the metric on manufacturing as there is no doubt now that 4D is capable of manufacturing candidates in sufficient quantity for our clinical programmes and beyond.

We have replaced the metric "Number of clinical studies commenced" with two related performance indicators, "Successful clinical trials" and "Clinical trial phases", as these better represent the progress being made with our focus programmes. We have also added in a new performance indicator, "Collaborations with partners", to represent business development performance.

Successful clinical trials

2 +100%

Pipeline progression performance measure – clinical success

Long-term value will be created via progression of the focus programmes into clinical development. To date we have two products, Blautix® for IBS and Thetanix® for Crohn's disease, that have successfully completed Phase I trials.

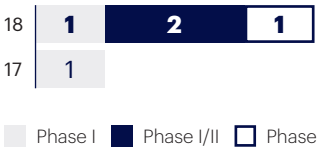
Links to strategic priorities

1 2 3 4 5

Clinical trial phases

2018:

Increase in PII and PI/II trials



Clinical progression performance measure

Long-term value will be created via successful progression of the focus programmes through clinical development phases. In 2017 Thetanix® was in Phase I testing and Blautix® had completed Phase I testing. In 2018 Blautix® entered Phase II and in 2019 our oncology candidate, MRx0518, commenced clinical studies, one Phase I/II study in combination with Keytruda® and one Phase I study as a monotherapy.

Links to strategic priorities

1 2 3 4 5

New strategic collaborations

2 +2

Business development performance measure

Strategic collaborations are essential to the long-term success of the business. As such we aim to select the best partners to further develop its products. In 2018 we entered into two significant strategic collaborations. The first, with Merck & Co., is a clinical collaboration on our immuno-oncology candidate MRx0518, combining it with Merck's sector-leading drug Keytruda®. The second is a long-term strategic collaboration with the University of Texas MD Anderson Cancer Center, a world-leading oncology clinical research institution.

Links to strategic priorities

1 2 3 4 5

Read about our strategic priorities
Pages 10 and 11

Number of patents granted

409 +98%

Research and innovation performance measure

Our strategic aim is to commercialise Live Biotherapeutic Products ("LBPs") and comprehensive intellectual property protection is vital to the Group's ability to achieve this. This valuable asset has undergone significant investment over the year, resulting in an increase of almost 100% in intellectual property assets.

Links to strategic priorities

1 2 3 **4** 5

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

£26.2m -47.6%

Financial resource measure

We need to ensure that we have sufficient cash in hand and on deposit to cover the anticipated future costs of progressing our LBP portfolio into and through the clinic. We have invested heavily in research and development and the cash position reflects this.

Links to strategic priorities

1 2 3 4 5

R&D spend (£m)

£24.9m +46.7%

Financial allocation of resources

The split of overheads between research and development ("R&D") and other costs, while not necessarily highlighting the qualitative aspects of that spend, enables us to ensure that we are directing sufficient operating funds towards the advancement of our technology. On average we spend approximately £1.5 million per product before taking it into the clinic. This compares favourably to the average cost of $10 million cited by experts in the field. In 2018, the R&D spend rose significantly as we progressed products further into the clinic.

Links to strategic priorities

1 2 3 **4** 5

Risk and Risk Management

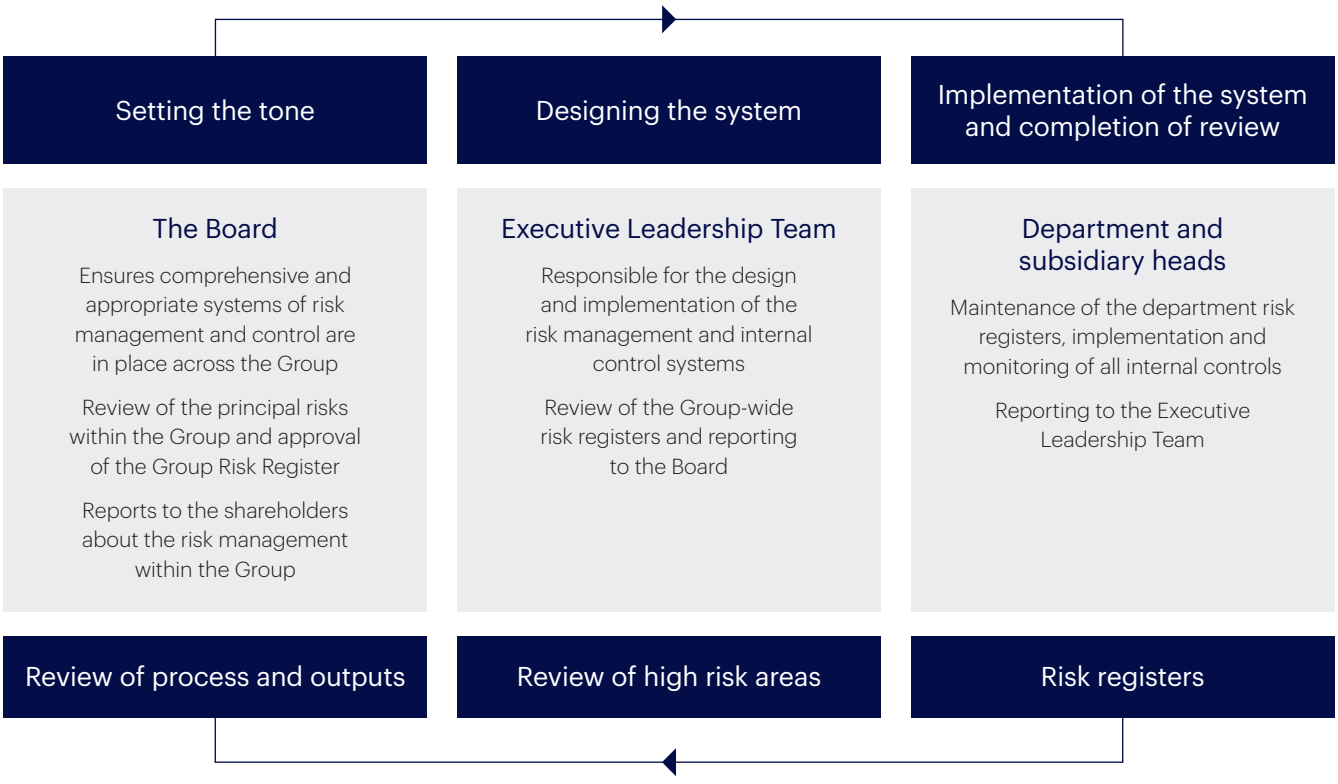
Identifying and understanding key risks to the business

The Group operates within a complex regulatory environment, which is subject to change. The nature of Live Biotherapeutic Product development exposes us to a number of additional 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.

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. These systems can be summarised as follows:



Read about our strategic priorities
Pages 10 and 11

Third-party patents could limit the Group's freedom to operate

Why is it important?
A third-party patent could be granted that affects a 4D technology or product. This could lead to us having to negotiate a licence, seeking to revoke the patent in legal proceedings, or even being unable to commercialise the future product, materially affecting future revenues.

Current mitigating actions
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 (including US and European patents on each of the lead projects) with a substantial year-on-year growth of the portfolio and an increasing number of new applications filed.

Change in level of risk
No change

Product development in a breakthrough technology could encounter unforeseen delays to programmes

Why is it important?
Live Biotherapeutic Products are a novel and emerging technology; neither 4D nor anyone else has taken a product through development to the marketplace. We are currently working on a number of wholly owned development programmes in our pipeline which will provide the Group with the opportunity to self-commercialise. Failure to complete development activities to plan may impact on the Group's ability to bring products to market on time which would affect the timings of future revenues and hinder the Group's ability to deliver its strategic goals.

Current mitigating actions
As we complete each stage of development and move through the clinic, we broaden our understanding of how to bring Live Biotherapeutic Products to market. In addition, as we widen our programmes in different disease areas, we further mitigate the risk of failure of a single programme. While Live Biotherapeutic Products are novel, the associated regulatory and clinical pathways are based on existing frameworks. We now have an established in-house clinical and regulatory team.

Change in level of risk
No change

Failure to gain regulatory approval

Why is it important?
The biotechnology and pharmaceutical markets are highly regulated by government authorities in the UK, the US and Europe. These regulatory requirements are a major factor in determining whether a substance can be developed into a marketable product and the amount of time and cost associated with such development. Even if products are approved, they may still face subsequent regulatory difficulties which could result in commercialisation delays and therefore financial loss.

Current mitigating actions
We have continued to invest in the clinical and regulatory team during the year.

We use highly competent regulatory consultants and continue to engage with regulators in the UK, Europe and the US.

Change in level of risk
No change

Risk and Risk Management continued

Exchange rate movements

Why is it important?
Although we report our results in Sterling, a significant proportion of our operations trade in local currency and as such the Group has a large exposure to the Euro and to a lesser extent the US Dollar. Fluctuations in these currencies could therefore impact the Sterling operating costs and therefore the cash flows of the Group.

Current mitigating actions
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 in level of risk
No change

UK referendum to leave the European Union ("EU") – Brexit

Why is it important?
The UK decision to leave the EU could have a significant impact on the way the Group operates, both in terms of our foreign subsidiaries, overseas suppliers and eventual revenue from any products which get to market. At the moment we are not certain of the impact that this will have on trade tariffs, taxation, the nature of international trade including access to trade and the exchange rate. Both these factors affect the relative cost and income that will be recognised in the accounts and have an impact on future planning.

Current mitigating actions
As the Group is currently pre-revenue the impact is currently limited to fluctuations in costs and as a result of the exchange rate and any cross-border tariffs. Through constant monitoring of the situation the Group remains reactive and looks to adjust its policies accordingly to minimise any adverse factors resulting from the ongoing negotiations. The Group reviews its cash flow projections for changes in exchange rates and the impact it would have and manages its holdings in funds accordingly.

Change in level of risk
No change

Financial risk

Why is it important?
The Group since inception in 2014 has incurred losses as it seeks to take its clinical candidates through to an approved product. The Group expects to make losses for the foreseeable future and may not be able to raise additional funds that may be needed to support its product development programmes and commercialisation.

Current mitigating actions
The Directors continue to keep a close control of overheads and explore sources of finance available.

Change in level of risk
No change

Read about our strategic priorities
Pages 10 and 11

The Strategic Report on pages 2 to 16 was approved by the Board on 20 May 2019 and signed on its behalf by:

Duncan Peyton
Chief Executive Officer
20 May 2019

Board of Directors

A Audit and Risk Committee
R Remuneration Committee
Committee Chairman

David Norwood

Non-Executive Chairman A R

Skills and experience: David has had a long career building a number of science, technology and investment companies. He is the founder of IP Group plc, one of the UK's leading technology commercialisation businesses, and a shareholder in the Company. Previously, he was chief executive of stockbroker Beeson Gregory (acquired by Evolution Group plc) after it acquired IndexIT Partnership, a technology advisory boutique he had founded in 1999. He was a founding shareholder of Evolution Group plc (acquired by Investec), and also co-founder of Ora Capital. He has been a founder and director of many UK technology companies including Oxford Nanopore Technologies Limited, Proximagen Limited, Synairgen plc, Ilika Technologies Limited, Oxford Catalysts and Plectrum Petroleum (acquired by Cairn Energy plc). He has also acted as seed investor and/or advisor to Wolfson Microelectronics Limited, Nanoco Technologies, Tissue Regenix Group plc and Arc International (now part of Synopsys).

Alex Stevenson

Chief Scientific Officer

Skills and experience: 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 specialised 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.

Ed Baracchini

Non-Executive Director (appointed January 2019)

Skills and experience: Ed has had a long and successful career in the pharmaceutical industry. He was previously the Chief Business Officer at Xencor Inc. where he led strategic alliances and licensing. During his time at Xencor he negotiated licence agreements with Novartis ($2.6 billion: immuno-oncology bispecific antibodies), Novo Nordisk ($600 million: drug discovery collaboration), Amgen ($500 million: option and development agreement autoimmune disease antibody) among numerous others. Prior to that he served as SVP Business Development for Metabasis Therapeutics.

Duncan Peyton

Chief Executive Officer

Skills and experience: 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.

Thomas Engelen

Non-Executive Director A R

Skills and experience: Thomas has been a founder and/or non-executive director of a number of UK life sciences companies including Colonis Pharma Limited, Warneford Partners Limited, Martindale Pharma Limited and Pneumagen Limited. Thomas has supported private equity and other investors in over 50 potential deal transactions, on targets in Europe and the US, from cash constrained/chapter 11 to cash rich with enterprise value of up to $1 billion. Before this Thomas worked in life sciences for over 20 years in senior executive roles. Starting in 1987 at Akzo Nobel Pharma, he worked with hospital products, diagnostics and medical equipment as general manager for the Middle East and Africa. After this he led Rosemont Pharmaceuticals in Leeds in niche oral liquid medicines, followed by being president of Organon in Brazil. He was promoted to VP The Americas and lastly to CMO at Organon, in charge of the global product portfolio, based in the US. Returning to Europe he led Novartis Consumer Health in the UK. Thomas has also acted as non-executive chairman at Akcros Holdings Limited, Penlan Healthcare and Quantum Pharmaceutical.

Professor Axel Glasmacher

Non-Executive Director (appointed January 2019)

Skills and experience: Axel was until recently Senior Vice President and Head of the Clinical Research and Development Hematology Oncology at Celgene, where he has worked in various global roles for more than ten years. His work at Celgene led to the approvals of Revlimid®, Idhifa® and Vidaza® (haematological cancers). He also worked on the PD-L1 inhibitor durvalumab. Prior to Celgene, he worked within the field of haematology-oncology at the University Hospital in Bonn.

Corporate Governance Statement

Governing for future growth

Chairman's introduction

On behalf of the Board, I am pleased to present our Corporate Governance Statement for the year ended 31 December 2018.

In this section, we explain our approach to the corporate governance of the Group. 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 recognises 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.

David Norwood
Non-Executive Chairman
20 May 2019

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 2018.

The AIM Rules for Companies require the Board to apply a recognised 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 ten broad principles and a set of disclosures grouped under three broad headings: deliver growth; maintain a dynamic management framework; and build trust.

Board composition and responsibility

The Board consists of six Directors, four of whom are Non-Executive. The names of the Directors, together with their biographical details, are set out on page 17.

The Board has determined that each of Ed Baracchini, Thomas Engelen and Axel Glasmacher is independent in character and judgement, and that there are no relationships or circumstances which could materially affect or interfere with the exercise of his independent judgement. The Board has determined that David Norwood is not independent, by virtue only of his holding of ordinary shares in the Company, summarised in the report from the Chairman of the Remuneration Committee (on page 25). The Board has nevertheless determined that (save only for such holding of ordinary shares) there are no relationships or circumstances which could materially affect or interfere with the exercise of his independent judgement.

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.

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.

Corporate Governance Statement continued

The Board recognises the need, and strives, to promote a corporate culture based on strong ethical and moral values

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 Thomas Engelen as Chairman and David Norwood as the other member of the Committee. Thomas Engelen is an independent Director and has recent and relevant financial experience. The Committee has primary responsibility for monitoring the quality of internal controls, ensuring that the financial performance of the Company is properly measured and reported on, and reviewing reports from the Company's auditor relating to the Company's accounting and internal controls, in all cases having due regard to the interests of shareholders.

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 Thomas Engelen as Chairman and David Norwood as the other member of the Committee. The Committee reviews the performance of the Executive Directors and senior management and determines their terms and conditions of service, including their remuneration and the grant of incentives, having due regard to the interests of shareholders.

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 not a majority of members who are independent Non-Executive Directors. Each Committee is, however, chaired by an independent Non-Executive Director.

Meetings

	Full Board	Audit and Risk Committee	Remuneration Committee
Number of meetings in year	7	2	1
Attendance:			
Executive Directors			
Duncan Peyton	7	—	—
Dr Alexander Stevenson	7	—	—
Non-Executive Directors			
David Norwood	6	2	1
Thomas Engelen	6	2	1

Corporate culture

The Board recognises 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 and relevant suppliers and contractors and is underpinned by the implementation and regular review, enforcement and documentation of relevant policies, including health and safety and environmental policies and share dealing and anti-corruption policies.

The Group is committed to providing a safe environment for its employees and all other relevant parties for which the Group is responsible. An open culture is encouraged within the Group, with regular communications to staff regarding progress and staff feedback regularly sought. The Company's management team regularly monitors the Group's cultural environment and seeks to address any concerns than may arise, escalating these to Board level as necessary.

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, colour, 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.

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 statement on Risk and Risk Management on pages 14 to 16.

Communicating vision and strategy

We are committed to communicating openly with our shareholders to ensure that its strategy and performance are clearly understood. The Directors seek to visit 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.

The Company maintains a dedicated email address which investors may use to contact the Company which, together with the Company's address, are prominently displayed on the Company's website, www.4dpharmaplc.com.

Communication with shareholders is seen as an important part of the Board's responsibilities, and care is taken to ensure that all price-sensitive information is made available to all shareholders at the same time. Responsibility for investor relations rests with the Chief Executive Officer.

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

Members
- Thomas Engelen (Chairman)
- David Norwood

As Chairman of the Audit and Risk Committee, I am pleased to present our report for the year ended 31 December 2018. 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 Committee acts independently of management to ensure the interests of shareholders are protected in relation to financial reporting, internal controls and risk management.

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, Thomas Engelen, with David Norwood as the other member. I am an independent Director and have recent and relevant financial experience.

There were two meetings held in the year ended 31 December 2018 – one in January and one in March.

Committee meetings are also attended by Stephen Dunbar, the 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 judgement 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, judgements 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 no impairment charge should be recorded in the year to 31 December 2018 and that the disclosures in the financial statements are appropriate.

Recoverability of intercompany balances

There are various intergroup balances within the Group. For intergroup balances held with entities in a current or shareholder deficit position there is a potential that these recoverable balances may not be realised in full.

Thomas Engelen
Chairman of the Audit and Risk Committee
20 May 2019

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

Members
- Thomas Engelen (Chairman)
- David Norwood

As Chairman of the Remuneration Committee, I am pleased to present our report for the year ended 31 December 2018.

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

During the year the members of the Committee were me, Thomas Engelen, an independent Non-Executive Director, and David Norwood, the Non-Executive Group Chairman. All members served on the Committee throughout the year and to the date of this report. I was Chairman of the Committee throughout this period.

There was one meeting of the Committee held in the year ended 31 December 2018, held in March. 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. 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 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 organisations.

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.

Directors' remuneration

The remuneration of the Directors who served on the Company's Board during the year to 31 December 2018 is as follows:

	31 December 2018		31 December 2017	
	Base salary and fees £000	**Total £000**	Base salary and fees £000	Total £000
Executive Directors				
Duncan Peyton	**102**	**102**	101	101
Dr Alexander Stevenson	**102**	**102**	101	101
Non-Executive Directors				
David Norwood	**25**	**25**	25	25
Thomas Engelen	**25**	**25**	25	25
	254	**254**	252	252

There were no bonus or pension schemes for the Directors during the year ended 31 December 2018.

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 21 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 calibre individuals.

Service contracts

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

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 2018, David Norwood held 7,080,000 ordinary shares in the Company's share capital, or 10.8% (31 December 2017: 10.7%); Duncan Peyton held 6,337,215 ordinary shares in the Company's share capital, or 9.7% (31 December 2017: 9.5%); Dr Alexander Stevenson held 6,337,242 ordinary shares in the Company's share capital, or 9.7% (31 December 2017: 9.5%); and Thomas Engelen held 519,000 shares in the Company's share capital, or 0.8% (31 December 2017: 0.8%).

No Director was granted any share options in the year ended 31 December 2018; none of the Directors held any share options at 31 December 2018.

Thomas Engelen
Chairman of the Remuneration Committee
20 May 2019

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 2018

Research and development spend

Pages 2 to 28 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.

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 page 17.

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 pages 24 and 25.

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 CEO's Report on pages 6 and 7.

Total research and development spend in the year to 31 December 2018 was £24.9 million (31 December 2017: £16.9 million). No development expenditure was capitalised in the current year or the year to 31 December 2017.

Subsequent events

There have been no important events affecting the Company or the Group since the year end.

Dividends

The Directors do not recommend payment of a dividend nor was there a dividend in the year to 31 December 2017.

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 24 to the financial statements.

Share capital and funding

As at 31 December 2018 share capital comprised 65,493,842 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.

Full details of the Group's and the Company's share capital movements during the year are given in note 20 to the financial statements.

Details of shares under option are provided in note 21 to the financial statements.

Substantial shareholders

The Company has been notified of the following interests of shareholders of 3% or more of the issued ordinary share capital of the Company at 31 December 2018, based on the ordinary shares in issue of 65,493,842 (31 December 2017: 65,493,842):

	Number of 0.25 pence ordinary shares as at 31 December 2018	**% of issued capital**	Number of 0.25 pence ordinary shares as at 31 December 2017	% of issued capital
Woodford Investment Management	**17,514,561**	**26.7**	17,514,561	26.7
Invesco Asset Management Limited	**9,163,617**	**14.0**	9,163,617	14.0
David Robert Norwood	**7,080,000**	**10.8**	7,000,000	10.7
Duncan Joseph Peyton	**6,337,215**	**9.7**	6,250,286	9.5
Dr Alexander James Stevenson	**6,337,242**	**9.7**	6,250,286	9.5
Lansdowne Partners	**3,000,000**	**4.6**	3,000,000	4.6

There were no notified significant changes in these holdings between 31 December 2018 and the date of the signing of these financial statements. The acquisitions of ordinary shares by Directors in the year ending 31 December 2018 were all made via market purchases.

Corporate Governance Statement

The Group's statement on corporate governance can be found in the Corporate Governance Statement on pages 18 to 21.

Going concern

The CEO's Report on pages 6 and 7 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 Risk and Risk Management on pages 14 to 16.

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. 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 the fourth quarter of 2019. The Directors are continuing to explore sources of finance available to the Group and have a reasonable expectation that they will be able to secure sufficient cash inflows into the Group to continue its activities for not less than twelve months from the date of approval of these accounts. They have therefore prepared the financial statements on a going concern basis.

Because the additional finance is not committed at the date of approval of these financial statements, these circumstances represent an uncertainty as to the Group's ability to continue as a going concern. Should the Group be unable to obtain further finance such that the going concern basis of preparation was no longer appropriate, adjustments would be required including to reduce the carrying value of assets to their recoverable amounts, and to provide for future liabilities that may arise.

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 authorise 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 on 20 June at 10 a.m. in the Chicago Room, Sofitel, Terminal 5, Wentworth Drive, London Heathrow Airport, Hounslow TW6 2GD.

Recommendation

The Board considers that the resolutions to be proposed at the Annual General Meeting are in the best interests of the Company and it is unanimously recommended that shareholders support these proposals as the Board intends to do in respect of its own holdings.

The Directors' Report was approved by the Board on 20 May 2019 and was signed on its behalf by:

Duncan Peyton
Chief Executive Officer
20 May 2019

Statement of Directors' Responsibilities

In relation to the Annual Report and financial statements

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 are required by the AIM Rules of the London Stock Exchange to prepare Group financial statements in accordance with International Financial Reporting Standards ("IFRS") as adopted by the European Union ("EU") and have elected under company law to prepare the Company financial statements in accordance with IFRS as adopted by the EU.

The Group financial statements are required by law and IFRS adopted by the EU 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 IFRSs adopted by the EU; 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 2018 which comprise the group statement of total comprehensive income, the group and parent company statements of financial position, the group and parent company statements of changes in equity, the group and parent company cash flow statements and notes to the financial statements, including a summary of significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and International Financial Reporting Standards (IFRSs) as adopted by the European Union 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 2018 and of the group's loss for the year then ended;
- the group financial statements have been properly prepared in accordance with IFRSs as adopted by the European Union;
- the parent company financial statements have been properly prepared in accordance with IFRSs as adopted by the European Union 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.

Material uncertainty related to going concern

We draw attention to the accounting policy on going concern on page 39 of the financial statements, which indicates that the cash flow forecast prepared by the directors estimate that the Group has sufficient funds to support the current level of activities to the final quarter of 2019 and therefore needs to raise additional funds. As stated in the accounting policy on going concern, these events or conditions, along with the other matters as set forth on page 27 indicate that a material uncertainty exists that may cast significant doubt on the Group's ability to continue as a going concern. Our opinion is not modified in respect of this matter.

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. In addition to the matter described in the Material uncertainty related to going concern section we have determined the matters described below to be the key audit matters to be communicated in our report.

Impairment of intangible assets

The risk

The Group carries goodwill and other intangibles amounting to £14,445,000 (2017: £14,674,000) in respect of past business combinations and subsequent purchases of intangible assets. As set out in note 11 the recoverability 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 is impaired.

Independent Auditor's Report continued

To the members of 4D pharma plc

Key audit matters continued

Impairment of intangible assets continued

Our response

We performed work on the Directors' impairment assessment as follows:

- Reviewing the underlying models, corroborating and challenging the judgements and assumptions used by management in their assessment of whether goodwill and other intangible assets had been impaired and performing sensitivity analysis on the cash flow model;
- Considering whether the models used in the prior year are still appropriate. We highlight that management continue to use the base/worst-case valuation outcome in respect of the valuation models in each assessment, on the grounds that this is a sensible foundation for determining any potential impairment given the stage of the programme lifecycles; and
- Assessing management's sensitivity analysis of key assumptions, including those in relation to the likelihood of successful product development, timing of sales, 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.

Carrying value of intra-group balances

The risk

At 31 December 2018 the parent company balance sheet includes amounts owed by subsidiary undertakings of £50,650,000 (2017: £33,159,000). The key audit matter is that this balance may not be recoverable owing to the ongoing losses sustained in the group's subsidiary undertaking. 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).

Our response

We performed work on the Directors assessment as follows:

- Reviewing forecasts, and challenging the assumptions 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; and
- Ensuring adequate disclosure in the notes to the financial statements.

An overview of the scope of our audit

As part of our planning we assessed the risk of material misstatement including those that required significant auditor consideration at the component and group level. Procedures were then performed to address the risk identified and for the most significant assessed risks of material misstatement, the procedures performed are outlined above in the key audit matters section of this report.

Other information

The directors are responsible for the other information. The other information comprises the information included in the annual report, other than the financial statements and our auditor's report thereon. 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.

In connection with our audit of the financial statements, 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 audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. 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 28, 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.

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.

Graham Bond FCA (Senior Statutory Auditor)
For and on behalf of RSM UK Audit LLP, Statutory Auditor
Chartered Accountants
3 Hardman Street
Manchester
M33HF
20 May 2019

Group Statement of Total Comprehensive Income

For the year ended 31 December 2018

	Notes	**31 December 2018 £000**	31 December 2017 £000
Research and development costs	4	**(24,908)**	(16,911)
Administrative expenses	4	**(4,212)**	(3,529)
Foreign currency gains/(losses)	4	**749**	(431)
Operating loss before non-recurring costs	4	**(28,371)**	(20,871)
Non-recurring costs	5	**—**	(3,474)
Operating loss after non-recurring costs		**(28,371)**	(24,345)
Finance income	7	**282**	482
Finance expense	7	**(348)**	(123)
Loss before taxation		**(28,437)**	(23,986)
Taxation	8	**4,747**	3,541
Loss for the year		**(23,690)**	(20,445)
Other comprehensive income			
Exchange differences on translating foreign operations		**(601)**	1,057
Loss for the year and total comprehensive income for the year		**(24,291)**	(19,388)
Loss per share			
Basic and diluted for the year	9	**(36.17)p**	(31.41)p

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

The notes on pages 39 to 64 form an integral part of these financial statements.

Group Statement of Financial Position

At 31 December 2018

Registered no. 08840579

	Notes	At 31 December 2018 £000	At 31 December 2017 £000
Assets			
Non-current assets			
Property, plant and equipment	10	**4,865**	5,211
Intangible assets	11	**14,445**	14,674
Taxation receivables	15	**137**	56
		19,447	19,941
Current assets			
Inventories	13	**290**	253
Trade and other receivables	14	**1,248**	3,238
Taxation receivables	15	**5,393**	4,308
Short-term investments and cash on deposit	16	**10,174**	38,133
Cash and cash equivalents	16	**16,053**	11,865
		33,158	57,797
Total assets		**52,605**	77,738
Liabilities			
Current liabilities			
Trade and other payables	17	**5,177**	4,982
		5,177	4,982
Non-current liabilities			
Deferred tax	18	**966**	965
Other payables	19	**699**	2,005
		1,665	2,970
Total liabilities		**6,842**	7,952
Net assets		**45,763**	69,786
Capital and reserves			
Share capital	20	**164**	164
Share premium	20	**108,296**	108,296
Merger reserve		**958**	958
Translation reserve		**67**	668
Other reserve		**(864)**	(864)
Share-based payments reserve	21	**708**	440
Retained earnings		**(63,566)**	(39,876)
Total equity		**45,763**	69,786

Approved by the Board and authorised for issue on 20 May 2019.

The notes on pages 39 to 64 form an integral part of these financial statements.

Duncan Peyton
Director
20 May 2019

Company Statement of Financial Position

At 31 December 2018

Registered no. 08840579

	Notes	At 31 December 2018 £000	At 31 December 2017 £000
Assets			
Non-current assets			
Property, plant and equipment	10	**465**	576
Intangible assets	11	**585**	849
Investment in subsidiaries	12	**11,805**	11,671
		12,855	13,096
Current assets			
Loans to subsidiaries	12	**50,650**	33,159
Trade and other receivables	14	**394**	428
Taxation receivables	15	**1,225**	478
Short-term investments and cash on deposit	16	**10,174**	38,133
Cash and cash equivalents	16	**13,475**	11,060
		75,918	83,258
Total assets		**88,773**	96,354
Liabilities			
Current liabilities			
Trade and other payables	17	**2,883**	1,345
Total liabilities		**2,883**	1,345
Non-current liabilities			
Other payables	19	**684**	1,979
		684	1,979
Net assets		**85,206**	93,030
Capital and reserves			
Share capital	20	**164**	164
Share premium	20	**108,296**	108,296
Merger reserve		**958**	958
Share-based payments reserve	21	**708**	440
Retained earnings		**(24,920)**	(16,828)
Total equity		**85,206**	93,030

The Company has elected to take the exemptions under s408 of the Companies Act 2016 not to present the parent company's Statement of Comprehensive Income. The Company's loss for the year was £8.092 million (31 December 2017: £7.950 million).

Approved by the Board and authorised for issue on 20 May 2019.

The notes on pages 39 to 64 form an integral part of these financial statements.

Duncan Peyton
Director
20 May 2019

Group Statement of Changes in Equity

For the year ended 31 December 2018

	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 2017	162	105,909	958	(389)	(864)	138	(19,431)	86,483
Issue of share capital (net of expenses)	2	2,387	—	—	—	—	—	2,389
Total transactions with owners recognised in equity for the year	2	2,387	—	—	—	—	—	2,389
Loss and total comprehensive income for the year	—	—	—	1,057	—	—	(20,445)	(19,388)
Share-based compensation	—	—	—	—	—	302	—	302
At 31 December 2017	164	108,296	958	668	(864)	440	(39,876)	69,786
Total transactions with owners recognised in equity for the year	—	—	—	—	—	—	—	—
Loss and total comprehensive income for the year	—	—	—	(601)	—	—	(23,690)	(24,291)
Share-based compensation	—	—	—	—	—	268	—	268
At 31 December 2018	**164**	**108,296**	**958**	**67**	**(864)**	**708**	**(63,566)**	**45,763**

Details regarding the purpose of each reserve within equity are given in note 22.

Company Statement of Changes in Equity

For the year ended 31 December 2018

	Share capital £000	Share premium £000	Merger reserve £000	Share-based payment reserve £000	Retained earnings £000	Total £000
At 1 January 2017	162	105,909	958	138	(8,878)	98,289
Issue of share capital (net of expenses)	2	2,387	—	—	—	2,389
Total transactions with owners recognised in equity for the year	2	2,387	—	—	—	2,389
Loss and total comprehensive income for the year	—	—	—	—	(7,950)	(7,950)
Issue of share-based compensation	—	—	—	302	—	302
At 31 December 2017	164	108,296	958	440	(16,828)	93,030
Total transactions with owners recognised in equity for the year	—	—	—	—	—	—
Loss and total comprehensive income for the year	—	—	—	—	(8,092)	(8,092)
Issue of share-based compensation	—	—	—	268	—	268
At 31 December 2018	**164**	**108,296**	**958**	**708**	**(24,920)**	**85,206**

Details regarding the purpose of each reserve within equity are given in note 22.

Group Cash Flow Statement

For the year ended 31 December 2018

	Notes	31 December 2018 £000	31 December 2017 £000
Loss after taxation		**(23,690)**	(20,445)
Adjustments for:			
Depreciation of property, plant and equipment	10	**905**	730
Amortisation of intangible assets	11	**296**	252
Loss on disposal of property, plant and equipment		**1**	79
Finance income	7	**(282)**	(482)
Finance expense	7	**348**	123
Share-based commitment		**—**	3,474
Share-based compensation	21	**268**	302
Cash flows from operations before movements in working capital		**(22,154)**	(15,967)
Changes in working capital:			
Increase in inventories		**(37)**	(15)
Decrease/(increase) in trade and other receivables		**1,894**	(588)
Increase in taxation receivables		**(1,166)**	(1,009)
(Decrease)/increase in trade and other payables		**(1,474)**	389
Cash outflow from operating activities		**(22,937)**	(17,190)
Cash flows from investing activities			
Purchases of property, plant and equipment	10	**(537)**	(1,885)
Purchases of software and other intangibles	11	**(4)**	(194)
Acquisition of subsidiaries net of cash acquired		**(660)**	—
Interest received		**378**	509
Monies drawn from deposit		**27,959**	1,978
Net cash inflow from investing activities		**27,136**	408
Cash flows from financing activities			
Hire purchase payments		**(10)**	(14)
Interest paid	7	**(1)**	—
Net cash inflow from financing activities		**(11)**	(14)
Increase/(decrease) in cash and cash equivalents		**4,188**	(16,796)
Cash and cash equivalents at the start of the year		**11,865**	28,661
Cash and cash equivalents at the end of the year	16	**16,053**	11,865

The cash outflow of £660,000 in respect of the acquisition of subsidiaries net of cash acquired relates to the investment by the Group in 4D Pharma Leon S.L.U. in 2016. The outflow in the current reporting period represents the final instrument of deferred consideration concerning successful GMP certification attained during the previous reporting period.

Company Cash Flow Statement

For the year ended 31 December 2018

	Notes	**Year to 31 December 2018 £000**	Year to 31 December 2017 £000
Loss after taxation		**(8,092)**	(7,950)
Adjustments for:			
Depreciation of property, plant and equipment	10	**152**	95
Amortisation of intangible assets	11	**264**	221
Loss on disposal of property, plant and equipment		**1**	79
Finance income		**(282)**	(481)
Finance expense		**346**	120
Share-based commitment		**—**	3,474
Share-based compensation	21	**135**	131
Cash flows from operations before movements in working capital		**(7,476)**	(4,311)
Changes in working capital:			
Decrease/(increase) in trade and other receivables		**34**	(83)
Increase in taxation receivables		**(747)**	(23)
(Decrease)/increase in trade and other payables		**(200)**	303
Cash outflow from operating activities		**(8,389)**	(4,114)
Cash flows from investing activities			
Purchases of property, plant and equipment	10	**(42)**	(493)
Purchases of software and other intangibles	11	**—**	(182)
Loans to subsidiary undertakings	12	**(17,491)**	(14,416)
Interest received		**378**	509
Monies drawn on deposit		**27,959**	1,978
Net cash outflow from investing activities		**10,804**	(12,604)
Increase/(decrease) in cash and cash equivalents		**2,415**	(16,718)
Cash and cash equivalents at the start of the year		**11,060**	27,778
Cash and cash equivalents at the end of the year	16	**13,475**	11,060

During the year to 31 December 2017 4D pharma plc converted £5.372 million of loans to subsidiary undertakings into investments in subsidiary undertakings in relation to 4D Pharma Leon S.L.U. Since this represented the conversion of existing loans no further cash was transferred and so is not noted in the Cash Flow Statement above. Further details on the transaction can be found in note 12.

Notes to the Financial Statements

For the year ended 31 December 2018

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 12. 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 2018.

The financial statements of 4D pharma plc and its subsidiaries (the "Group") for the year ended 31 December 2018 were authorised for issue by the Board of Directors on 20 May 2019 and the Statement 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

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 2018 and the requirements of the Companies Act 2006 applicable to companies reporting under IFRS.

(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's Statement and Chief Executive Officer's Report on pages 5 to 7 outline 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 page 7 along with details of its cash flow and liquidity. Note 24 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. 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 the fourth quarter of 2019. The Directors are continuing to explore sources of finance available to the Group and have a reasonable expectation that they will be able to secure sufficient cash inflows into the Group to continue its activities for not less than twelve months from the date of approval of these accounts. They have therefore prepared the financial statements on a going concern basis.

Because the additional finance is not committed at the date of approval of these financial statements, these circumstances represent an uncertainty as to the Group's ability to continue as a going concern. Should the Group be unable to obtain further finance such that the going concern basis of preparation were no longer appropriate, adjustments would be required including to reduce the balance sheet values of assets to their recoverable amounts, and to provide for future liabilities that may arise.

(d) Functional and presentational currency

These financial statements are presented in Pounds Sterling, which is the Group's functional currency. 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.

Notes to the Financial Statements continued

For the year ended 31 December 2018

2. Basis of preparation continued

(e) Use of estimates and judgements continued

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 at 31 December 2018 was £35,169,000. The value of the additional deferred tax asset not recognised at the year end is £6,099,000. Further information is included in note 8.

(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 given in note 3(i).

Valuation of intangibles on acquisition

Valuation of an early stage drug discovery pharmaceutical company is a notoriously difficult task. 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. In addition, clinical development risks, measured as product attrition failure rates, incurred as drugs progress through the clinic are reasonably well documented and can be applied as meaningful risk adjusters to account for the chance of development failure.

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.

3. Significant accounting policies continued

(a) Basis of consolidation continued

(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.

(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) 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.

Notes to the Financial Statements continued

For the year ended 31 December 2018

3. Significant accounting policies continued

(e) 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 substantively 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.

(f) Initial application of IFRS 9 Financial Instruments

The application of IFRS 9 has not changed the measurement of the Company's financial liabilities or the Company's accounting policies for the recognition or derecognition of financial instruments.

(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.

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:

- Plant and machinery – straight line over three to ten years
- Fixtures, fittings and office equipment – straight line over four to five years
- Leasehold improvements – straight line over five to ten years

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 derecognised 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 derecognition of the asset is included in the Income Statement in the year of derecognition.

(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 groups of assets.

3. Significant accounting policies continued

(i) Intangible assets continued

Intellectual property and patents continued

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.

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 its recoverable amount. Useful lives and residual values are reviewed annually and where adjustments are required these are made prospectively.

A software item is derecognised 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 derecognition of the asset is included in the Income Statement in the year of derecognition.

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.

Notes to the Financial Statements continued

For the year ended 31 December 2018

3. Significant accounting policies continued

(j) Impairment of assets

An asset's recoverable amount is the higher of an asset's 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.

(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.

3. Significant accounting policies continued

(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) Lease payments

Leases are classified as finance leases wherever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases which are expensed directly to the Group Statement of Comprehensive Income.

Assets held under hire purchase agreements and finance leases are recognised as assets of the Group at their fair value or, if lower, at the present value of the minimum lease payments, each determined at the inception of the lease. The corresponding liability is included in the Group Statement of Financial Position as a hire purchase obligation. Lease payments are apportioned between finance charges and a reduction of the lease obligations so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are charged to the Group Income Statement. Rentals payable under operating leases are charged to the Group Statement of Comprehensive Income on a straight-line basis over the term of the lease.

(s) Share-based payments

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. 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") interpretations effective as at 31 December 2018.

During the year, the Group adopted the following standards effective from 1 January 2018. The Group has applied these standards in the preparation of the financial statements and has not adopted any new or amended standards early.

IFRS 15 Revenue from Contracts with Customers

IFRS 15 is intended to introduce a single framework for revenue recognition and clarify principles of revenue recognition. This standard modifies the determination of when to recognise revenue and how much revenue to recognise. The core principle is that an entity recognises revenue to depict the transfer of promised goods and services to the customer of an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Although the Group has not historically reported revenues, a review of existing collaboration agreements has been undertaken and the new standard was adopted effective of 1 January 2018. Management has determined that there was no revenue from contracts with customers in the prior year, and consequently no impact on adoption.

Notes to the Financial Statements continued

For the year ended 31 December 2018

3. Significant accounting policies continued

(u) New accounting standards and interpretations continued

Adoption of IFRS continued

IFRS 9 Financial Instruments

IFRS addresses the classification and measurement of financial assets and financial liabilities. The complete version of IFRS 9 was issued in July 2014. It replaces the guidance in IAS 39 that relates to the classification and measurement of financial instruments. IFRS 9 retains but simplifies the mixed measurement model and establishes three primary measurement categories for financial assets: amortised cost, fair value through other comprehensive income (OCI) and fair value through profit or loss. The basis of classification depends on the entity's business model and the contractual cash flow characteristics of the financial asset, while there is now a new expected credit loss model that replaces the incurred loss impairment model used in IAS 39. For financial liabilities there were no changes to classification and measurement except for the recognition of changes in credit risk in other comprehensive income, for liabilities designated at fair value through profit or loss.

The Group has applied IFRS 9 Financial Instruments for the first time in the year ended 31 December 2018. The Group's Statement of Financial Position does not include any financial assets affected by the requirements of IFRS 9. The Company's financial assets at 1 January 2018, namely loans advanced to subsidiary undertakings, were previously classified as loans and receivables under IAS 39, and are classified as assets at amortised cost under IFRS 9. As described in note 12 to the financial statements, there is no change in the measurement of these assets on adoption of IFRS 9, and so no restatement of comparatives in the Company Statement of Financial Position has been made.

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 potential effects for the implementation of IFRS 16 are noted separately below. 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.

UK IFRS	Departure from EU IFRS on Brexit	31 March 2019
IFRS 17	Insurance Contracts	1 January 2021
IFRIC 23	Uncertainty over Income Tax Treatments	1 January 2019
Various standards	Annual Improvements to IFRSs 2015–2017 Cycle	1 January 2019
Amendment to references to the Conceptual Framework	Amendment to references	1 January 2020
Amendments to IAS 1 and IAS 8	Definition of Materials	1 January 2020
Amendments to IAS 19	Plan Amendment, Curtailment or Settlement	1 January 2019
Amendments to IAS 28	Long-term Interests in Associates and Joint Ventures	1 January 2019
Amendments to IFRS 3	Business Combinations	1 January 2020
Amendments to IFRS 9	Prepayment Features with Negative Compensation	1 January 2019

IFRS 16 Leases

IFRS 16 introduces a comprehensive model for the identification of lease arrangements and accounting treatments for both lessors and lessees. IFRS 16 will supersede the current guidance including IAS 17 Leases and the related interpretations when it becomes effective.

IFRS 16 distinguishes leases and service contracts on the basis of whether an identifiable asset is controlled by a customer. Distinctions of operating leases (off Statement of Financial Position) and finance leases (on Statement of Financial Position) are removed for lessee accounting, and are replaced by a model where a right-of-use asset and corresponding liability have to be recognised for all leases by lessees (i.e. all on Statement of Financial Position) except for short-term leases and leases of low value assets.

The right-of-use asset is initially measured at cost and subsequently measured at cost (subject to certain exceptions) less accumulated depreciation and impairment losses, adjusted for any measurement of the lease liability. The lease liability is initially measured at the present value of the lease payments that are not paid at that date. Subsequently, the lease liability is adjusted for interest and lease payments, as well as the impact of lease modifications, amongst others. Furthermore, the classification of cash flows will also be affected as operating lease payments under IAS 17 are presented as operating cash flows, whereas under the IFRS 16 model, the lease payments will be split into a principal and interest portion which will be presented as financing and operating cash flows respectively.

In contrast, for finance leases where the Group is a lessee, as the Group has already recognised an asset and a related finance lease liability for the lease arrangement, the Directors of the Company do not anticipate that the application of IFRS 16 will have a significant impact on the amounts recognised in the Group's consolidated financial statements. The Directors are currently assessing the impact of IFRS 16 as the changes are likely to have a significant impact on the financial results.

4. Operating loss

By nature:	Year to 31 December 2018 £000	Year to 31 December 2017 £000
Operating loss is stated after charging/(crediting):		
Research and development expense		
Depreciation on property, plant and equipment	**831**	686
Amortisation of intangible assets	**231**	229
Staff costs (see note 6)	**4,396**	3,335
Operating lease rentals:		
– Land and buildings	**153**	118
– Equipment	**2**	37
Other contractual commitments	**4,417**	1,916
Other research and development costs	**14,878**	10,590
	24,908	16,911
Administrative expenses		
Depreciation on property, plant and equipment	**74**	44
Amortisation of intangible assets	**65**	23
Loss on disposal of property, plant and equipment	**1**	79
Staff costs (see note 6)	**1,686**	1,141
Operating lease rentals:		
– Land and buildings	**145**	113
– Equipment	**2**	1
Auditor's remuneration	**52**	49
Legal and professional	**124**	253
Consultancy	**1**	5
Other administrative costs	**2,062**	1,821
	4,212	3,529
Foreign currency losses/(gains)	**749**	(431)
Auditor's remuneration		
Audit services:		
– Fees payable to Company auditor for the audit of the parent and the consolidated accounts	**43**	35
– Auditing the financial statements of subsidiaries pursuant to legislation	**8**	10
– Non-audit services	**1**	4
Total auditor's remuneration	**52**	49

Notes to the Financial Statements continued

For the year ended 31 December 2018

5. Non-recurring costs

As detailed in other payables (see note 19) on 23 August 2017 contingent consideration became due following the achievement of 4D Pharma Cork Ltd's initial milestone.

The contingent liability was initially calculated upon the acquisition based on the discounted probability of the potential liability at the time of acquisition. With the successful completion of the first milestone the management had to reassess the probability of success of subsequent milestones and therefore increase the contingent liability. This resulted in the non-recurring cost in the year to 31 December 2018 of £Nil (31 December 2017: £3.474 million).

6. Staff costs

	Year to 31 December 2018			Year to 31 December 2017		
	Research and development £000	**Administrative £000**	**Total £000**	Research and development £000	Administrative £000	Total £000
Wages and salaries	**3,476**	**1,376**	**4,852**	2,597	868	3,465
Social security costs	**658**	**183**	**841**	528	104	632
Pension contributions	**74**	**47**	**121**	51	26	77
	4,208	**1,606**	**5,814**	3,176	998	4,174
Share-based compensation	**188**	**80**	**268**	159	143	302
	4,396	**1,686**	**6,082**	3,335	1,141	4,476
Directors' remuneration (including benefits in kind) included in the aggregate remuneration above comprised:						
Emoluments for qualifying services	**—**	**254**	**254**	—	252	252

Directors' emoluments (excluding social security costs, but including benefits in kind) disclosed above include £101,587 (31 December 2017: £101,323) paid to the highest paid Director.

The Directors were not granted any share options in the year ended 31 December 2018 or the period ended 31 December 2017 and none of the Directors held any share options at 31 December 2018.

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:

Group	**Year to 31 December 2018 Number**	Year to 31 December 2017 Number
Directors	**4**	4
Scientific and administrative staff	**112**	89
	116	93

Company	**Year to 31 December 2018 Number**	Year to 31 December 2017 Number
Directors	**4**	4
Scientific and administrative staff	**20**	17
	24	21

7. Finance income and finance expense

	Year to 31 December 2018 £000	Year to 31 December 2017 £000
Finance income		
Bank interest receivable	**282**	482
Finance expense		
Hire purchase interest	**(1)**	(2)
Unwinding of discount	**(346)**	(120)
Other interest payable	**(1)**	(1)
	(348)	(123)
Net finance (expense)/income	**(66)**	359

Bank interest receivable includes £33,102 (31 December 2017: £128,926) which is receivable after the year end.

8. Taxation

The tax credit is made up as follows:

	Year to 31 December 2018 £000	Year to 31 December 2017 £000
Current income tax		
Total current income tax	**(4,760)**	(3,557)
Adjustment in respect of prior years	**13**	16
Current deferred tax		
Current year charge	**—**	—
Total deferred tax	**—**	—
Total tax credit recognised in the year	**(4,747)**	(3,541)

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

	Year to 31 December 2018 £000	Year to 31 December 2017 £000
Loss before taxation	**(28,437)**	(23,986)
Tax at the average standard rate of 18.67% (31 December 2017: 18.95%)	**(5,308)**	(4,544)
Effects of:		
Expenses not deductible for tax purposes	**107**	714
Adjustments from foreign currency translations on subsidiaries	**3**	—
Enhanced research and development expenditure	**(3,412)**	(2,561)
Property, plant, equipment and software timing differences	**8**	6
Deferred tax not provided on losses	**2,569**	1,853
Adjustment in respect of prior years	**11**	17
Effects of variation on tax reclaims over the standard rate	**1,275**	974
Tax tax credit recognised in the year	**(4,747)**	(3,541)

Notes to the Financial Statements continued

For the year ended 31 December 2018

8. Taxation continued

Reductions to the UK corporation tax rates were substantively enacted as part of the Finance Bill 2016 on 6 September 2016. These reduce the main rate to 17% from 1 April 2020 with the revised rate forming the basis for the UK portion of the deferred tax calculation noted below.

At 31 December 2018, the Group had tax losses available for carry forward of approximately £35.169 million (31 December 2017: £32.691 million). The Group has not recognised deferred tax assets relating to such earned forward losses of approximately £6.099 million (31 December 2017: £5.645 million).

At 31 December 2018, the Company had tax losses available for carry forward of approximately £12.194 million (31 December 2017: £7.827 million). The Group has not recognised deferred tax assets relating to such earned forward losses of approximately £2.073 million (31 December 2017: £1.331 million).

Group's 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.

9. Loss per share

(a) Basic and diluted

	Year to 31 December 2018 £000	Year to 31 December 2017 £000
Loss for the year attributable to equity shareholders	**(23,690)**	(20,445)
Weighted average number of shares		
Ordinary shares in issue	**65,493,842**	65,084,561
Basic loss per share (pence)	**(36.17)p**	(31.41)p

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

(b) Adjusted

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

Reconciliation of adjusted loss after tax:

	Year to 31 December 2018 £000	Year to 31 December 2017 £000
Reported loss after tax	**(23,690)**	(20,445)
Non-recurring costs	**—**	3,474
Adjusted loss after tax	**(23,690)**	(16,971)
Adjusted basic loss per share (pence)	**(36.17)p**	(26.08)p

10. Property, plant and equipment

Group	Plant and machinery £000	Fixtures, fittings and office equipment £000	Leasehold improvements £000	Total £000
Cost				
At 31 December 2016	3,584	180	683	4,447
Additions	1,381	102	446	1,929
Disposals	—	(1)	(111)	(112)
Reclassifications	24	(73)	—	(49)
Exchange rate adjustment	257	1	61	319
At 31 December 2017	5,246	209	1,079	6,534
Additions	474	6	57	537
Disposals	(2)	—	—	(2)
Exchange rate adjustment	62	—	12	74
At 31 December 2018	**5,780**	**215**	**1,148**	**7,143**
Depreciation				
At 31 December 2016	497	38	53	588
Provided during the year	592	34	104	730
Released on disposal	—	—	(33)	(33)
Reclassifications	2	(12)	—	(10)
Exchange rate adjustment	38	—	10	48
At 31 December 2017	1,129	60	134	1,323
Provided during the year	715	51	139	905
Released on disposal	(1)	—	—	(1)
Exchange rate adjustment	42	—	9	51
At 31 December 2018	**1,885**	**111**	**282**	**2,278**
Net book value				
At 31 December 2018	**3,895**	**104**	**866**	**4,865**
At 31 December 2017	4,117	149	945	5,211
At 31 December 2016	3,087	142	630	3,859

Included in the totals above are the following assets held under hire purchase or finance leases; these agreements are secured against the assets to which they relate.

Notes to the Financial Statements continued

For the year ended 31 December 2018

10. Property, plant and equipment continued

Group assets under hire purchase and finance lease agreements	Plant and machinery £000	Total £000
Cost		
At 31 December 2016	—	—
Additions	44	44
Exchange rate adjustment	2	2
At 31 December 2017	46	46
Exchange rate adjustment	1	1
At 31 December 2018	**47**	**47**
Depreciation		
At 31 December 2016	—	—
Provided during the year	8	8
At 31 December 2017	8	8
Provided during the year	9	9
Exchange rate adjustment	1	1
At 31 December 2018	**18**	**18**
Net book value		
At 31 December 2018	**29**	**29**
At 31 December 2017	38	38
At 31 December 2016	—	—

10. Property, plant and equipment continued

Company	Plant and machinery £000	Fixtures, fittings and office equipment £000	Leasehold improvements £000	Total £000
Cost				
At 31 December 2016	88	116	111	315
Additions	99	96	298	493
Disposals	—	(1)	(111)	(112)
Reclassifications	34	(34)	—	—
At 31 December 2017	221	177	298	696
Additions	26	7	9	42
Disposals	(2)	—	—	(2)
At 31 December 2018	**245**	**184**	**307**	**736**
Depreciation				
At 31 December 2016	11	25	23	59
Provided during the year	33	28	34	95
Released on disposal	—	—	(33)	(33)
Reclassifications	5	(6)	—	(1)
At 31 December 2017	49	47	24	120
Provided during the year	47	45	60	152
Released on disposal	(1)	—	—	(1)
At 31 December 2018	**95**	**92**	**84**	**271**
Net book value				
At 31 December 2018	**150**	**92**	**223**	**465**
At 31 December 2017	172	130	274	576
At 31 December 2016	77	91	88	256

There were no assets held under hire purchase or finance leases in the Company.

Notes to the Financial Statements continued

For the year ended 31 December 2018

11. Intangible assets

Group	Software £000	Patents £000	Intellectual property £000	Goodwill £000	Total £000
Cost					
At 31 December 2016	84	1,081	4,507	8,999	14,671
Additions	194	—	—	—	194
Reclassifications	49	—	—	—	49
Exchange rate adjustment	4	—	—	391	395
At 31 December 2017	331	1,081	4,507	9,390	15,309
Additions	4	—	—	—	4
Exchange rate adjustment	1	—	—	63	64
At 31 December 2018	**336**	**1,081**	**4,507**	**9,453**	**15,377**
Amortisation					
At 31 December 2016	15	357	—	—	372
Provided during the year	52	200	—	—	252
Reclassifications	10	—	—	—	10
Exchange rate adjustment	1	—	—	—	1
At 31 December 2017	78	557	—	—	635
Provided during the year	97	199	—	—	296
Exchange rate adjustment	1	—	—	—	1
At 31 December 2018	**176**	**756**	**—**	**—**	**932**
Net book value					
At 31 December 2018	**160**	**325**	**4,507**	**9,453**	**14,445**
At 31 December 2017	253	524	4,507	9,390	14,674
At 31 December 2016	69	724	4,507	8,999	14,299

Company	Software £000	Patents £000	Total £000
Cost			
At 31 December 2016	14	1,076	1,090
Additions	182	—	182
At 31 December 2017 and 31 December 2018	**196**	**1,076**	**1,272**
Amortisation			
At 31 December 2016	2	199	201
Provided during the year	22	199	221
Reclassifications	1	—	1
At 31 December 2017	25	398	423
Provided during the year	65	199	264
At 31 December 2018	**90**	**597**	**687**
Net book value			
At 31 December 2018	**106**	**479**	**585**
At 31 December 2017	171	678	849
At 31 December 2016	12	877	889

11. Intangible assets continued

Goodwill amounting to £9.453 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 were 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 at 31 December 2018 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 exceeds the carrying amount by 5,230%. 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.

12. Investment and loans to subsidiaries

Non-current assets

Company	Ordinary shares £000
At 31 December 2016	6,128
Loans converted to shares	5,372
Share-based payments issued to employees in subsidiaries	171
At 31 December 2017	11,671
Share-based payments issued to employees in subsidiaries	134
At 31 December 2018	**11,805**
By subsidiary	
4D Pharma Research Limited	2,441
4D Pharma Cork Limited	3,872
4D Pharma Leon S.L.U.	5,492
At 31 December 2018	**11,805**

Notes to the Financial Statements continued

For the year ended 31 December 2018

12. Investment and loans to subsidiaries continued

Current assets

Company	Loans to subsidiary undertakings £000
At 31 December 2016	24,114
Additions in the year	14,417
Loans converted to shares	(5,372)
At 31 December 2017	33,159
Additions in the year	17,491
At 31 December 2018	**50,650**
By subsidiary	
4D Pharma Research Limited	45,088
4D Pharma Cork Limited	2,220
4D Pharma Leon S.L.U.	3,342
At 31 December 2018	**50,650**

For years beginning after 1 January 2018 changes to measurement technique on intercompany loans came into effect under IFRS 9. These changes required that 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 no impairment is required; as such no adjustments are required to the accounts for the current or prior year.

On 3 October 2017 the Company converted €6.052 million of existing loans into ordinary shares in 4D Pharma Leon S.L.U. at a rate of €1.127:£1 creating an additional investment in shares of £5.372 million and reducing the Group loans by a corresponding amount.

Details of the share-based payments issued to employees in subsidiaries are included in note 21.

Subsidiary undertakings

Subsidiary undertakings	Country of incorporation	Registered office	Principal activity	Holding at 31 December 2018
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%**
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.

The following companies were exempt from the requirements of the Companies Act 2006 to prepare individual accounts for the financial year ended 31 December 2018, by virtue of section 394A of the Companies Act 2006:

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

13. Inventories

	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Consumables and materials	**290**	**—**	253	—

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

During the year £1.851 million (31 December 2017: £1.388 million) of inventories were expensed to the Income Statement.

14. Trade and other receivables

	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Prepayments	**1,248**	**394**	3,238	428
	1,248	**394**	3,238	428

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

15. Taxation receivables

Non-current receivables	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Corporation tax	**137**	**—**	56	—
	137	**—**	56	—

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

Current receivables	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Corporation tax	**4,690**	**966**	3,522	445
VAT	**703**	**259**	786	33
	5,393	**1,225**	4,308	478

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

16. Cash, cash equivalents and deposits

	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Short-term investments and cash on deposit	**10,174**	**10,174**	38,133	38,133
Cash and cash equivalents	**16,053**	**13,475**	11,865	11,060
	26,227	**23,649**	49,998	49,193

Under IAS 7 Statement of Cash Flows, cash held on long-term deposits (being deposits with maturity of greater than three months and no more than twelve months) that cannot readily be converted into cash has been classified as a short-term investment. The maturity on this investment was less than twelve months at the reporting date.

Cash and cash equivalents at 31 December 2018 include deposits with original maturity of three months or less of £10 million (Group) and £10 million (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 24.

Notes to the Financial Statements continued

For the year ended 31 December 2018

17. Trade and other payables

Current	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Trade payables	**1,931**	**845**	1,803	1,000
Other payables	**28**	**24**	695	27
Contingent consideration	**1,641**	**1,641**	—	—
Taxation and social security	**278**	**128**	264	146
Hire purchase and finance leases	**11**	**—**	10	—
Accruals	**1,288**	**245**	2,210	172
	5,177	**2,883**	4,982	1,345

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.

18. Deferred tax

Group	£000
At 31 December 2016	963
Exchange rate movement	2
At 31 December 2017	965
Exchange rate movement	1
At 31 December 2018	**966**

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

19. Other payables

Non-current payables	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Contingent consideration	**684**	**684**	1,979	1,979
Hire purchase and finance leases	**15**	**—**	26	—
	699	**684**	2,005	1,979

Contingent consideration

The contingent consideration is made up as follows:

	31 December 2018 Group £000	31 December 2018 Company £000	31 December 2017 Group £000	31 December 2017 Company £000
Brought forward	**1,979**	**1,979**	774	774
Reassessment of contingent consideration to be satisfied in shares	**—**	**—**	4,395	4,395
Discounting of estimated future cash flows	**—**	**—**	(921)	(921)
Part settlement of contingent consideration in shares	**—**	**—**	(2,389)	(2,389)
Unwinding of discount	**346**	**346**	120	120
	2,325	**2,325**	1,979	1,979
Analysed as follows:				
Within one year	**1,641**	**1,641**	—	—
More than one year	**684**	**684**	1,979	1,979
	2,325	**2,325**	1,979	1,979

The above contingent consideration relates to the amounts due on the remaining milestones which form part of the original contingent acquisition costs for the entire issued share capital in Tucana Health Limited (now 4D Pharma Cork Limited) on 10 February 2016.

19. Other payables continued

The contingent consideration is based on milestones, the first of which reflects the technical validation of the MicroDx diagnostic platform, enabling the stratification of IBS patients. MicroDx has been designed to diagnose, stratify and monitor the treatment of patients based on their gut microbiome, the bacteria which colonise the human gastrointestinal tract.

On 23 August 2017 635,692 ordinary shares were allotted in 4D pharma plc for an aggregate value of €2.6 million (at £3.7575 per 4D pharma plc share, being the average mid-market price of a 4D share for the five business days immediately preceding the date of allotment) and were admitted on 31 August 2017.

The following table lists the inputs used in valuing the provision:

The Group and the Company	**2018**	2017
Share price	**755p**	755p
Costs of capital	**17.50%**	17.50%

Hire purchase and finance leases

Secured non-current payables	**31 December 2018 Group £000**	**31 December 2018 Company £000**	31 December 2017 Group £000	31 December 2017 Company £000
Hire purchase and finance leases	**15**	**—**	26	—
Analysed as follows:				
Due between one and two years	**11**	**—**	11	—
Due between two and five years	**4**	**—**	15	—
	15	**—**	26	—

Repayment and interest rates on hire purchase and finance lease agreements are fixed at the contract date. The average effective borrowing rate for hire purchase and finance leases at 31 December 2018 was 3.95% (31 December 2017: 3.95%) over a weighted average remaining period of 27 months (31 December 2017: 39 months).

All hire purchase and finance lease agreements are secured by the Company against the assets to which they relate.

20. Share capital

The Group and the Company	Ordinary shares Number	Share capital £000	Share premium £000	Total £000
Allotted, called up and fully paid ordinary shares of 0.25p				
At 1 January 2017	64,858,150	162	105,909	106,071
Shares issued on 23 August 2017	635,692	2	2,387	2,389
Ordinary shares at 31 December 2017 and 31 December 2018	**65,493,842**	**164**	**108,296**	**108,460**

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, comprising 0.25 pence ordinary shares.

On 23 August 2017 the Company issued 635,692 shares equating to €2.6 million in share capital at a five previous working day mid-market value of £3.7575 per share with the payment representing the settlement of deferred consideration on the acquisition of 4D Pharma Cork Limited (formerly Tucana Health Limited) on achievement of its first milestone. The milestone achieved reflected the technical validation of the MicroDx diagnostic platform enabling the stratification of IBS patients. MicroDx has been designed to diagnose, stratify and monitor the treatment of patients based on their gut microbiome, the bacteria which colonise the human gastrointestinal tract.

21. Share-based payment reserve

The Group and the Company	£000
At 31 December 2016	138
Share-based compensation	302
At 31 December 2017	440
Share-based compensation	268
At 31 December 2018	**708**

Notes to the Financial Statements continued

For the year ended 31 December 2018

21. Share-based payment reserve continued

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

A charge of £268,051 has been recognised in the Group Statement of Total Comprehensive Income for the year (31 December 2017: £301,570).

The Company recognised a charge of £134,645 (31 December 2017: £130,164) in the Statement of Total Comprehensive Income and an increase in investments in subsidiaries of £133,406 (31 December 2017: £171,406) for the year.

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 10 November 2015, 11 May 2016, 24 May 2017 and 26 October 2018. Share options are awarded to management and key staff as a mechanism for attracting and retaining key members of staff. These options vest over a three-year period 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.

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.

The Group and the Company	**31 December 2018 Number**	31 December 2017 Number
Outstanding at the start of the year	**341,462**	101,056
Vesting conditions not met	**(40,909)**	—
Granted during the year	**746,779**	240,406
Outstanding at 31 December	**1,047,332**	341,462
Exercisable at 31 December	**—**	—

Weighted average exercise price of options

The Group and the Company	**31 December 2018 Pence**	31 December 2017 Pence
Outstanding at the start of the year	**0.25**	0.25
Granted during the year	**0.25**	0.25
Outstanding at 31 December	**0.25**	0.25
Weighted average remaining contractual life of options	**2.35 years**	2.03 years

No share options were exercised during the year (31 December 2017: none) and no share options were exercisable at 31 December 2018 or at 31 December 2017.

The following table lists the inputs to the models used at the respective year ends:

The Group and the Company	**31 December 2018**	31 December 2017
Expected volatility	**50.96%**	52.50%
Risk-free interest rate	**0.72%**	0.41%
Expected life of options	**3 years**	3 years
Weighted average exercise price	**0.25p**	0.25p
Weighted average share price at date of grant	**141p**	321p

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. 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

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.

Translation reserve

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

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 Group Statement of Changes in Equity.

Retained earnings

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

23. Commitments

Operating lease commitments

The Group leases premises under non-cancellable operating lease agreements. The future aggregate minimum lease and service charge payments under non-cancellable operating leases are as follows:

	31 December 2018 Group £000	**31 December 2018 Company £000**	31 December 2017 Group £000	31 December 2017 Company £000
Land and buildings:				
– Not later than one year	**363**	**150**	296	150
– After one year but not more than five years	**627**	**363**	1,087	600
Other leases:				
– Not later than one year	**2**	**2**	2	2
– After one year but not more than five years	**1**	**1**	3	3
	993	**516**	1,388	755

Capital expenditure

The Group has no committed capital expenditure at 31 December 2018 nor at 31 December 2017.

The Company has no committed capital expenditure at 31 December 2018 nor at 31 December 2017.

Contractual commitments

The Group has the following non-cancellable contractual commitments at the balance sheet date:

	31 December 2018 Group £000	**31 December 2018 Company £000**	31 December 2017 Group £000	31 December 2017 Company £000
Research and development:				
– Not later than one year	**3,545**	**3,132**	2,642	2,099
– After one year but not more than five years	**5,864**	**5,864**	5,146	4,738
	9,409	**8,996**	7,788	6,837

Notes to the Financial Statements continued

For the year ended 31 December 2018

24. 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 half-yearly 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 20 and in the Group Statement of Changes in Equity. Total equity was £45.763 million at 31 December 2018 (31 December 2017: £69.786 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 2018			
Categorisation of financial instruments	**Fixed rate £000**	**Floating rate £000**	**Non-interest bearing £000**	**Total £000**
Group				
Cash, cash equivalents and short-term deposits	**5,174**	**21,052**	**1**	**26,227**
Trade and other payables	**—**	**—**	**(3,545)**	**(3,545)**
Hire purchase and finance leases	**(26)**	**—**	**—**	**(26)**
	5,148	**21,052**	**(3,544)**	**22,656**
Company				
Cash, cash equivalents and short-term deposits	**5,174**	**18,474**	**1**	**23,649**
Inter-company loans	**—**	**—**	**50,650**	**50,650**
Trade and other payables	**—**	**—**	**(1,242)**	**(1,242)**
	5,174	**18,474**	**49,409**	**73,057**

	31 December 2017			
Categorisation of financial instruments	Fixed rate £000	Floating rate £000	Non-interest bearing £000	Total £000
Group				
Cash, cash equivalents and short-term deposits	38,133	11,865	—	49,998
Trade and other payables	—	—	(4,944)	(4,944)
Hire purchase and finance leases	(36)	—	—	(36)
	38,097	11,865	(4,944)	45,018
Company				
Cash, cash equivalents and short-term deposits	38,133	11,060	—	49,193
Inter-company loans	—	—	33,159	33,159
Trade and other payables	—	—	(1,321)	(1,321)
	38,133	11,060	31,838	81,031

24. Financial risk management continued

Liquidity risk continued

All categories of financial assets and liabilities are measured at amortised cost with the 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.

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

	31 December 2018			31 December 2017		
Group	**Less than one year £000**	**Between one and two years £000**	**Between two and five years £000**	Less than one year £000	Between one and two years £000	Between two and five years £000
Trade and other payables	**3,545**	**—**	**—**	4,944	—	—
Hire purchase and finance leases	**11**	**11**	**4**	10	11	15
	3,556	**11**	**4**	4,954	11	15

As all financial liabilities in the Company are expected to mature within the next twelve months no maturity of liabilities has been presented.

Foreign currency risk

The Group's principal functional currency is Sterling. However, the Group has two subsidiaries whose functional currency is the Euro and 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 2018 or at 31 December 2017 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:

	31 December 2018				31 December 2017			
Group	**GBP £000**	**USD £000**	**EUR £000**	**Total £000**	GBP £000	USD £000	EUR £000	Total £000
Cash, cash equivalents and deposits	**25,771**	**123**	**333**	**26,227**	48,676	90	1,232	49,998
Trade and other payables	**(2,126)**	**(185)**	**(1,234)**	**(3,545)**	(3,439)	(35)	(1,470)	(4,944)
Hire purchase and finance leases	**—**	**—**	**(26)**	**(26)**	—	—	(36)	(36)
	23,645	**(62)**	**(927)**	**22,656**	45,237	55	(274)	45,018

Sensitivity analysis to movement in exchange rates

Given the immaterial net payable balances in foreign currency, the exposure to a change in exchange rate is negligible.

Notes to the Financial Statements continued

For the year ended 31 December 2018

25. Related party transactions

Key management compensation	**Year to 31 December 2018 £000**	Year to 31 December 2017 £000
Executive Directors		
Salaries and short-term benefits	**204**	202
Employer's National Insurance and social security costs	**25**	25
	229	227
Fees for services provided as Non-Executive Directors		
Salaries and short-term benefits	**50**	50
Employer's National Insurance and social security costs	**5**	4
	55	54
Other key management		
Salaries and short-term benefits	**1,054**	775
Employer's National Insurance and social security costs	**175**	134
Employer's pension contributions	**39**	26
Share-based payment charge	**268**	302
	1,536	1,237

Group

Transactions with Directors and related entities

During the year Aquarius Equity Partners Limited, an entity controlled by Duncan Peyton and Dr Alexander Stevenson, charged the Group £Nil for consultancy and other office expenses (31 December 2017: £2,116). As at 31 December 2018 £Nil was due to Aquarius Equity Partners Limited (31 December 2017: £Nil).

Transactions with key personnel and related entities

During the year summ.it assist llp, an entity in which Stephen Dunbar is a partner, recharged the Group £1,337 for IT equipment and software (31 December 2017: £3,593), £90 for IT support (31 December 2017: £377) and £20,211 for accounting and bookkeeping services (31 December 2017: £65,939); there were no staff recruitment fees for the year (31 December 2017: £12,500) but £2,391 was charged for other costs (31 December 2017: £3,718). At the year end £2,392 was due to summ.it assist llp (31 December 2017: £5,065).

Biomar Microbial Technologies, an entity in which Antonio Fernandez is a director, charged rent and building service costs to the Group of £17,756 (31 December 2017: £302,487) and the Group charged Biomar £32,981 for services (31 December 2017: £Nil). At the year end £3,557 was due from Biomar Microbial Technologies (31 December 2017: £5,469 was due to Biomar Microbial Technologies).

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

During the year Aquarius Equity Partners Limited, an entity controlled by Duncan Peyton and Dr Alexander Stevenson, charged the Company £Nil for office expenses (31 December 2017: £2,116). At at 31 December 2018 £Nil was due to Aquarius Equity Partners Limited (31 December 2017: £Nil).

Transactions with key personnel and related entities

During the year summ.it assist llp, an entity in which Stephen Dunbar is a partner, recharged the Company £1,337 for IT equipment and software (31 December 2017: £3,593), £90 for IT support (31 December 2017: £377) and £20,211 for accounting and bookkeeping services (31 December 2017: £65,939). There were no staff recruitment fees for the year (31 December 2017: £12,500) but £2,391 was charged for other costs (31 December 2017: £3,718). At the year end £2,392 was due to summ.it assist llp (31 December 2017: £5,065).

All related party transactions during the current and previous year were considered to be at arm's length.

Company Information

Country of incorporation
United Kingdom

Company number
08840579

Directors
DR Norwood (Non-Executive Chairman)
DJ Peyton
AJ Stevenson
T Engelen (Non-Executive)
E Baracchini (Non-Executive)
A Glasmacher (Non-Executive)

Company Secretary and registered office
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and

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