BUSINESS UNIT

FY19 REVENUE OF £33.5M (FY18: £30.9M)

Research Reagents

Enabling a better understanding of disease mechanisms and the drivers behind disease

The Research Reagents business unit provides both tools and services to enable customers to better understand disease mechanisms and identify drivers behind disease by inducing permanent (gene editing) and transient (gene modulation) changes in gene expression.

The Research Reagents business unit includes three primary offerings:

- Custom-made and off-the-shelf (OTS) RNAi gene modulation reagents that are manufactured in our facility in Boulder, Colorado;
- CRISPR reagents that are manufactured in our facility in Boulder, Colorado; and
- OTS cell models and custom cell engineering services that are delivered from our operations in Cambridge, U.K.

In 2017, we acquired Dharmacon, a major global provider of gene modulation technologies with an automated manufacturing platform and e-commerce infrastructure. Today, we are a market leader in the supply of RNAi gene modulation reagents and custom-made CRISPR reagents, both of which we believe are recognised as "industry standards" and are used by leading academic researchers around the world.

Our core expertise in cell line engineering is the source of our broad catalogue of cell lines and custom cell line engineering services, which are sold to biopharmaceutical companies and top-tier academic institutions. Our OTS catalogue comprises engineered cell models that have been developed over the last 10 years and are sold from our e-commerce platform.

Our main customers for OTS reagents are academic researchers and biopharmaceutical companies that use RNAi and CRISPR reagents to perform gene modulation and editing. Sales are typically high volume and captured primarily through our e-commerce channel, with a smaller proportion of sales captured via territory field sales.

Our cell line engineering service has been predominantly sold to biopharmaceutical companies through our field sales and Key Account Partners. Cell line engineering is available in two versions, a specialist custom engineering service for customers with highly specific requirements and a standard service that meets the needs of the broader market and provides a custom engineering service based on a limited number of cell types and engineering techniques. As we execute our automation expansion, we expect to introduce the ability for our customers to order our standard offering through our e-commerce platform.

Research Reagents generated revenues of £33.5 million up 8.4% on the prior year (FY18: £30.9 million). This Business unit contributes 57% (FY18: 57%) of overall Group revenues and provides a solid platform that underpins the growth of the other business units, with a customer base of approximately 2,000 customers spending regularly with us.

Whilst revenue growth benefiting from currency movement (most of this Business Unit's revenues are derived in U.S.$) it also reflects a renewed market interest in RNAi. This follows recent launch of a number of therapies which have been successfully developed by companies such as Alnylam Therapeutics (Nasdaq: ALNY) using this long-established gene modulation technology.

The full year performance is all the more encouraging given that the performance of the Research Reagents Business unit, was held back somewhat by the performance of Cell Line Engineering where we were struggling to compete on price and delivery times.

We are pleased to report that the increase in capacity that has been delivered in Cell Line Engineering through the "Investing for Growth" strategy (see Strategy section) has enabled us to significantly decrease our manufacturing costs and extend our offering, with more compelling solutions on both price and turnaround times. We expect the benefits of the increased capacity and the launch of our new integrated eCommerce-enabled web site to come through more strongly in the first half of 2020, which will also see a further capacity increase through implementation of automation.

BUSINESS UNIT

FY19 REVENUE OF £11.4M (FY18: £8.9M)

Screening

Enabling improved target discovery and patient stratification

Our Screening business unit provides tools and services that allow our customers to understand disease pathways, find and validate novel drug targets, identify mechanisms of drug resistance or sensitivity and stratify patients for clinical trials based on their genetic profile. We believe we have a market-leading position in CRISPR screening and are also an established market leader in the supply of both siRNA and CRISPR screening libraries. Both can be applied across the full spectrum of drug discovery and development.

The business unit includes three primary business lines:

- Pooled CRISPR screens;
- Arrayed RNAi and CRISPR screens, drug screens and immunology assays; and
- RNAi and CRISPR screening libraries.

Pooled screening can produce quantitative data on new and established compounds, their relationship with disease pathways, the genetic determinants of disease or how genetic variation predicts patient responses to drug intervention. Arrayed CRISPR screening is more complex than pooled screening and gives researchers an inherently greater insight into single specific gene edits, and combinations of edits. Often an experiment will begin with a pooled screen and then proceed to an arrayed screen. A CRISPR library consists of thousands of plasmids or synthetic molecules, with each one containing a single gRNA that targets a specific gene. CRISPR screening libraries enable the investigation of entire gene families or biological pathways through the use of custom or pre-defined libraries of CRISPR-Cas9 reagents.

Customers for this business unit are biopharmaceutical companies that are targeted by our field sales and Key Account partners and have the choice of buying either a fully outsourced service or just the specific tools they need, for example, CRISPR and siRNA libraries, to perform their own screening in-house.

Horizon was a commercial pioneer for CRISPR Screening, starting in 2013 with various in-house development programs to evolve a commercial offering. We believe our first mover advantage provides us with a market leading position, due to the following factors:

- We had 655 functional genomic screens completed and ongoing at the end of FY19, more than 97% of which were CRISPR screens, including with 8 out of the largest 20 global biopharmaceutical companies by revenue.
- The majority of CRISPR screens are novel, either in the library set up, the cells that are being used, the read-out that is desired and/or the analysis.
- We believe that the ability to provide both the screening services and libraries and reagents under one organisation is unique and a key point of differentiation, resulting in learning synergies that can be applied from screening to library development (and vice versa).
- We have made significant R&D investments to optimise screening services. Combined with the insights we have gained around disease areas such as oncology, we are able to understand our clients' needs and advise them of the best CRISPR screening approach for their desired outcomes.

Screening generated revenues of £11.4 million (FY18: £8.9 million) up 28.1% on prior year, with the volume of Pooled and Arrayed, including CRISPR and RNAi, screens up year on year and orders nearly doubling, continuing the strong momentum we have seen in previous years. Much of this growth has been driven by an increase in the number of highly complex large-scale screens for major biopharmaceutical companies. During the second half of the year we secured an order of £850,000 from one of the leading global pharma companies – our largest single order to date.

BUSINESS UNIT

FY19 REVENUE OF £8.6M (FY18: £8.7M)

BioProduction

Delivering a commercial disruptive cell line for the production of biologics

Our BioProduction business unit provides biopharmaceutical and contract manufacturing organizations with a commercially disruptive CHO cell line for use in the production of biologic drugs.

The BioProduction business unit includes two primary business lines:

- OTS gene-edited CHO cells; and
- custom CHO cell lines.

The cell lines are provided to customers under license. We also provide custom CHO gene engineering services, either utilising our own cell line or one provided by the customer.

There is strong demand from companies pursuing biologic drugs and looking for cost-effective ways to commence biomanufacturing. However, high entry costs and restrictive licensing conditions can make it difficult to gain access to CHO cells suitable for manufacturing biologics. Our key competitors license cell lines as part of an integrated offering, which typically includes the supply of cell media and feed or manufacturing services. By contrast, we are commercially disruptive by licensing our high quality, gene edited CHO cell line as a standalone allowing our customers to benefit from a high quality, gene edited cell line without the obligation to purchase ancillary products and services.

Since first entering this market in 2013 our cell lines have secured more than 70 licensing engagements and have now been validated by five successful Investigational New Drug (IND) filings by customers (four in the U.S.A. and one in China). The growing acceptance of our CHO cell lines in the market has meant that an increasing number of customers have proceeded directly to full commercial licenses without going through an initial evaluation period. This has significantly shortened our sales cycle.

Bioproduction is moving from high-volume production to small runs of high value biologics, with flexibility, increased speed to market and cost reduction being key drivers. Similarly, biologics manufacturers are seeking to reduce the complexity of the production process, for example, by simplifying the essential purification process. We believe that our expertise in cell line engineering can be leveraged to address many of these issues and that this represents a major growth opportunity.

Having established our reputation in the market, we believe that the opportunity now exists for us to move from being a commercially disruptive provider to a technologically disruptive provider of engineered CHO cells. In December we signed a strategic partnership with Mammoth Biosciences pursuant to which we will utilise Mammoth's novel Cas technology for the development of a suite of next generation engineered CHO lines. We will also have the right to sublicense this technology through Mammoth to customers who wish to modify their own proprietary CHO cell line. We are seeking early access customers through 2020 into 2021.

BioProduction continued to perform well and enjoyed a strong performance during the year generating revenues of £8.6 million (FY18: £8.7 million) but as expected, ended the year flat year-on-year. This is not an indication of momentum stalling, rather it reflects two large contracts with long lead times in FY18 that did not happen in FY19.

BUSINESS UNIT

FY19 REVENUE OF £4.8M (FY18: £5.6M)

Diagnostics
Enabling expert diagnosis

Our cell line derived reference standards provide a source of genetically defined, quantitative, sustainable reference material.

The Diagnostics business unit provides molecular reference standards derived from gene-edited cell lines that we have developed to mimic human genetic diseases. The offering includes three primary business lines.

- OTS cell-based reference standards;
- Made to Order (MTO) reference standards (generally large volumes of OTS cell-based reference standards and/or modifications to their format);and
- Custom cell-based reference standards that are developed to meet customers' specific requirements.

These reference standards are used to evaluate molecular assays on a research use only basis.

We are an innovator of cell line-derived reference standards. We provide a source of genetically defined, quantitative, sustainable and independent third-party reference material, critical to the validation and routine performance monitoring of assays, primarily in oncology. These cell-derived tools are more effective than oligonucleotides and plasmids in replicating the complexity of human samples while also being more reproducible than patient-derived controls. As a reference standard, these products are an inexhaustible supply of consistently reproducible tools.

Our offering includes OTS and MTO cell-based reference standards, which are typically sold through our e-commerce platform, and both tailored and custom-developed reference standards that are developed to customers' specific requirements and predominantly sold via our field sales team. Customers for these reference standards include platform developers, biopharmaceutical and diagnostics companies.

The key drivers for these tools are the need for fast, minimally invasive methods for detection of disease (as opposed to patient derived biopsies) against a regulatory backdrop for increased standardisation to remove subjectivity. The competition in this space is fragmented, with the bulk of the reference standard market comprising non-profit companies offering patient samples.

Performance in the first half of the year was disappointing, with the Business unit reporting revenues of £2.5 million (HY18: £3.5 million), 28.6% down on prior year. The root cause of this was internal organisational issues rather than external market factors. As expected, under new leadership this business unit recovered strongly in the second half, closing the period with revenues of £4.8 million, down 14.3% on the prior year performance (FY18: £5.6 million).

BUSINESS UNIT FY19 REVENUE OF £4.6M (FY18:£4.6M)

In Vivo

Providing pre-clinical animal models for drug discovery

The In Vivo Business Unit provided genetically engineered rat and mice models from its premises in Boyertown, Pennsylvania and St Louis, Missouri, U.S.A. In Vivo's animal models feature specific gene deletions, insertions, repressions and modifications, and are used as pre-clinical models for human genetic disease for drug discovery.

In December 2019 we completed the divestment of the In Vivo Business Unit to Envigo RMS LLC for a nominal consideration settled in cash. In the period in the financial year that Company owned the In-Vivo business revenues of £4.6 million were generated. These are excluded from Continuing Operations in the Company's FY19 results and going forward.

The acquisition by Envigo will provide an opportunity for the In Vivo business to flourish within a larger, market-leading company and also provides continuity for its many customer relationships. Significantly, both parties are committed to an ongoing collaboration to support growing opportunities with in-vivo CRISPR screening. This will enable Horizon to continue crucial aspects of its animal model screening work in conjunction with Envigo, and to generate additional business opportunities of benefit to both companies.

NEW FOR 2020

Base Editing

Enabling more accurate gene editing

We have a strategic collaboration with Rutgers to develop base editing technology and in January 2020 we exercised our option for an exclusive license to commercialise this technology. We expect to refine this technology over the next 18 months ahead of full commercialisation and from the start of 2020 we have created a new dedicated business unit to provide the necessary focus on its development.

Base editing is a new category in gene editing that allows scientists to make specific edits to base pairs in DNA or RNA. This technology allows for more accurate gene editing by minimising the unintended genomic changes that are inherent with the use of CRISPR gene editing techniques. It therefore has the potential to enable a large therapeutic opportunity by making gene editing a viable treatment option for many diseases that to date have no treatment.

Currently we believe we are one of only two commercial entities with the ability to enable base editing in therapeutic applications and the only entity with plans to make this technology available to the market broadly.

We are now seeking early access partners to assess and shape the development of this platform. We expect that the future revenue model will include initial access fees, milestone payments and royalty payments for marketed therapeutics products.