



Driving Innovation In UK Life Sciences





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There is no doubt that innovation is critical for the progression of the life sciences industry and its ability to serve the needs of patient populations. The UK is a leading environment for the life sciences sector, representing the third biggest biopharma financing region in the world; behind only Cambridge, Massachusetts and the San Francisco Bay area.

There are both notable obstacles and exciting opportunities for the UK to grow its reputation and foster innovation, and a roundtable organized by Alderley Park and Informa Pharma Intelligence brought together industry leaders to discuss these.

This roundtable took place prior to the COVID-19 outbreak.

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The Importance Of Open Innovation

In a truly global market, the most promising opportunities for life sciences companies come from a willingness to adopt 'open innovation'. With this comes externalization of processes, which in turn involves giving up control to an extent; this is not always easily done by pharma companies.

Johnson & Johnson Innovation's vice president of new ventures and transactions Nerida Scott opened the discussion by considering the importance of adopting the concept of open innovation: "I think there are very few companies – large or small – who can do everything themselves. From having first-hand experience on both the biotech side and large pharma side, I think partnerships are very important in terms of combining expertise, capital and cultural ways of working."

Paul Peter Tak, CEO of Kintai Therapeutics, said, "it's very important to work with the best external experts, not only to get access to new knowledge, but also to be challenged. By accessing the brightest minds and creating a culture of scientific debate, you can leverage collective intelligence, advance the science and create value."

Looking at the issue from the perspective of small companies, Ned Wakeman, director of the Alderley Park Accelerator, affirmed that, "two or three people can't do it themselves. They often don't know the right questions to ask, so the new emerging model of externalized capital efficient drug discovery and development is only achievable through partnerships."

"Everything that we have been talking about comes under the umbrella of 'externalized R&D'; which I think is a better term to describe what we are talking about," Ted Fjällman, CEO of Prokarium, noted. He moved on to discuss Contract Research Organizations (CROs) in the region, stating, "I find that in the UK we have a really good CRO ecosystem. We should cherish and build on that."

Kath Mackay, managing director at Alderley Park, expanded on this. "CROs are a real UK strength. There has historically been this perception that CROs are doing the heavy lifting, when actually there is a lot of innovation going on. When you work with a CRO they won't just do what you tell them to do and deliver a contract or a piece of work. Often, they are the brains behind a development program, and they really give input at a strategic level."

It is clear that CROs play a pivotal role in the prospects and opportunities of smaller companies. They can provide extensive expertise and infrastructure, which is critical for businesses with limited resources; it means they do not have to invest heavily into creating their own and can instead focus on innovating. The fact that the UK has such a strong foothold in this area means it is well set up to foster innovation and build its reputation as a market leading region.

CAPITAL AND INVESTMENT CHALLENGES

For younger companies offering great potential to innovate, one of the most common barriers to success is lack of investment. Without capital, they simply cannot fund the expense of R&D, but it can be equally difficult to meet clinical development deadlines and milestones associated with investors looking for rapid returns. For this reason, patient capital was raised as a potential aid to smaller businesses.

Wakeman says the term 'patient capital' should not be misinterpreted as meaning undemanding or unfocused investment:

"There is still the urgency to hit both value milestones and decision milestones. It just allows you not to get killed by evaluation and become untouchable if you miss a milestone."

In the UK, there is clear ambition to nurture a truly world-class life sciences sector. The UK government has set an ambitious target of creating four new flagship life sciences companies with more than a \$20 billion market cap over a ten-year period, in its Life Sciences Industrial Strategy led by Sir John Bell.

However, one of the biggest barriers to achieving this level of success in the UK is raising capital, which still lags far behind the US. This currently limits the ability of companies to take research further and faster down the R&D pipeline.

All the participants agreed that finding ways of generating more long-term investment – so called ‘patient capital’ – is vital. Much of the discussion regarding these limitations revolved around pension funds, who under current UK investment rules are not permitted to invest in risky fields, such as biotech.

UK biotech sector leaders are hopeful that these rules could be updated in the future. The Bioindustry Association (BIA) says even a small fraction of the £2.2 trillion under management by pension funds could make an enormous difference to the start-ups and scale-ups in innovative industries like life sciences.¹

Fjällman says, “you don’t have to reinvent the wheel, you just look at other countries. Countries that do well in the world in terms of young financing are usually where pension funds are allowed to invest in VCs and public markets. Something we can’t do in the UK.”



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– Nerida Scott

Scott continued, “the UK is a fantastic ecosystem for innovation. But it needs to be more ambitious and have the support to advance that innovation further. You need patient capital, and you need access to significant funding – both private and also public. That is the big difference about taking something much further down the line; it’s the amount of capital. You then have options for your road to market – partnering or growing organically. You have different valuations, different ways of creating companies that can generate value for investors.”

Comparing to the approach in the US, Tak maintained that there is a real opportunity to create megafunds to support investments in biopharmaceutical research at a global competitive level: “Think of financial structures in which a larger number of biomedical programs at various stages of development are funded by a single financial entity – such as a pension fund – to substantially reduce the risk and create value”. He continued: “I live half the time in Cambridge, Massachusetts and I see this amazing availability of capital. If we would utilize the same capital here in the UK, we could be a global leader in the field.”

THE UNIQUE UK ENVIRONMENT

Despite the concerns regarding raising capital in the UK, there is undoubtedly a unique opportunity for life sciences companies. This is thanks to a world-class mix of academic excellence in life sciences, a vibrant early-stage VC sector, the presence of several big pharma companies – particularly AstraZeneca and GSK – a single payer health care system in the NHS, and a strong CRO and research

services ecosystem. These are all critical ingredients in enabling smaller companies to be launched and bring innovation to patients with limited resources.

Additionally, the government has shown desire to promote the country as a destination for innovative collaborations within the biopharma sector, particularly as it looks to life outside the European Union in 2021. One such example is its new partnership with Novartis on a groundbreaking cardiovascular prevention trial which includes the provision for fast-tracked uptake of inclisiran.²

Another example is the UK Biobank, a world-leading project launched in 2006 which has collected clinical, biometric and genomic data from 500,000 volunteers, which will be made available to researchers.

Scott sees this as a flagship resource for the life sciences industry, driven by the UK. "Other countries are building prospective longitudinal datasets, but those endeavors are less advanced. The UK Biobank was set up in 2006, so it has already got almost 15 years of data collected. It's phenomenal to have that foresight, to actually be adding to that data in a truly open innovation platform. As an industry, we spend a lot of money and time testing in the preclinical stages, only to take potential therapeutics to human trials and find completely unexpected outcomes. But if you have already got human data that can validate disease pathways more effectively, that has the potential to significantly reduce the failure rate – and streamline clinical trials."

Mackay was optimistic as to the potential long-term impact of the government's investments. "Time will tell, but these are huge initiatives that were established. Hundreds and hundreds of millions of pounds were spent in infrastructure to create the life science industries of the future. We are at the very start of that. It's difficult to really predict what will come out the other side. There could be game changing things, as no one else is making this type of targeted investment."

These investments, plus stellar academic environments, the National Health Service and a thriving charity sector all offer huge potential for innovation, but it was agreed that they could be better utilized for maximum impact.

UNALIGNED INCENTIVES IN ACADEMIA

With such a high concentration of world class academic institutions, research capabilities in the UK are exceptional. However, there are barriers to it reaching its full potential, in part due to the requirements for academic career progression being focused more heavily on publication.

"It's very hard fundamentally when academics in the UK are most strongly incentivized towards publication, rather than incentives that have the potential to deliver a difference to patients. It's not necessarily a lack of personal desire, it's just that if you want to advance in your career, and if you want to get the next grant of funding for your lab, the incentives aren't quite aligned yet," Scott noted.

Tak considered that a lack of understanding could also be a factor. "It's a cultural thing I think, that academics are unaware of exactly what is needed to not only have a great high impact paper, but also ensure this is translated into an impact on patients. The most highly cited papers come from collaboration between academia and industry. So there is a real opportunity to advance the science together and at the same time develop medicines that have an impact on patients' lives."

Naj Rotheram, medical lead for partnerships at Boehringer Ingelheim, agreed that the impact on patients should be the focus of all life sciences academia. "It's all well and good to boast about being the heart of academic innovation, but if within half a mile of where you do your great science you have a population that is not benefitting, or there is deprivation and some fundamental diseases that are still being poorly managed, there is something wrong [if you are not factoring those needs into your research goals]."

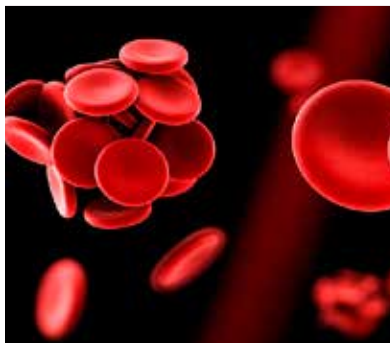
THE CHARITY SECTOR AND PATIENT GROUPS

Moving to the impact of the charity sector, it was agreed that this was a great advantage for the UK in terms of how it provided access to patients and health data. One prime example of this is Cancer Research UK; it is the world's biggest independent cancer research charity, and provides funding and expertise across basic, translational and clinical research programs. In the financial year 2017/18, it supported research worth £413 million and collaborated with the industry.

Mackay commented: "The charity sector is a huge asset in terms of accessing patients, which is completely unique to the UK. The work that associations and charities are doing to pull everyone together and listen to patient voices and other groups, you just don't see that in other countries."

Addressing potential concerns about the security of patient data through sharing data for research, Mackay continued, "while there are ethical considerations with patient data, most patients do want to consent because they want to be part of finding a cure."

Tak says the UK life sciences industry appears more patient-centric than the US. "That is where there is a real opportunity in the UK. There should be a strong focus on the patient during every stage of discovery and development, as it leads to better and more relevant medicines." As the concept of patient-centricity is an increasingly prevalent topic in the global pharma landscape, this clearly offers a great chance for the UK to establish itself as a market leader.



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– Naj Rotheram**

On the other hand, Rotheram considered the limits clinicians can pose on patients at the receiving end of innovation. "I don't think enough clinicians are thinking about their patients and how to change frontline services when they are making strategic research decisions. That is an important element, moving from innovation in a science lab to innovating the way patients are cared for and treated."

Additionally, Rotheram provided an example from her prior experience as a haematologist. "Oral anticoagulants are a good case study of how amazing innovation is thwarted by conservative, scientific mindsets. There was constant pushback because of concerns relating to safety profiles and bleeding, when actually, from a patient's perspective, what they want is a medicine that is going to do the most to reduce their chance of having a clot or a stroke. They will put up with a bit of bleeding, but they don't want the fear of losing their independence, their freedoms or their dignity. I don't think enough people thought about the patient's perspective when they were making decisions. The science has got to keep the patient in mind."

THE ROLE OF LIFE SCIENCES CLUSTERS

The existence of clusters is regarded as beneficial for innovation, as it means that pharma companies can find everything they need in confined locations when externalizing their activities.

Tak supported this notion, stating, "critical mass is important in a biopharmaceutical ecosystem to allow for the best collaborations, an optimal outsourcing strategy and

to create more job security by having many opportunities for new roles.”

Wakeman gave a key example of the benefits of clusters when recounting the journey of an academic clinician who approached Alderley Park with a cardiovascular drug candidate. He said Alderley Park was able to supply the robust but friendly ‘So what?’ questions which tested the original concept, and helped the individual develop her clinical and business propositions.

“The story was, I have a better anti-coagulant and we said, “So? Who needs to care and what do they care about?”

We provided a framework within which to examine key line of sight and development questions, and within that framework she talked to heads of cardiovascular of major pharma partners and to on site experts. As a result of that she has been able to answer important commercial questions, and just raised a combined £8.5m.”

Scott says the UK needs to ensure its life science clusters have visibility and scale. “Globally we need to have that focus. It brings people, it brings money and it brings excellence, because if people want to have a really phenomenal career they go to where they think they can have many top-rated roles. We need to continue to build the UK’s critical mass to compete with those two epicenters [of Cambridge, Massachusetts and San Francisco].”

Nevertheless, Tak says these clusters can in principle succeed anywhere: “It doesn’t really matter whether it’s Manchester or London or Hong Kong or wherever. As long as the science is good.”

Finally, Rotheram noted the impact that the size of the UK could have on the location of clusters and their concentration. “We are really quite a small island; it should make

no difference that you are in Manchester because there should be a flagship that connects us all. It just so happens that we don’t quite have that; we have got to make connectivity in the UK better.”

CONCLUSION

Overall, it was agreed that the critical way to position the UK as leader for life sciences innovation was to ensure all the different elements of the life sciences ecosystem are in place. Tak summarized this when considering what companies needed to innovate successfully and get products to patients:

“You can only be successful if you look at it in a holistic way. You need to get every piece, starting with the science and then organizing yourself in the best way possible. You need to have total clarity about decision merits, how people work together, and the external world. You need to have the finance, then you need to have the financial discipline to make the right decisions about your programs.”

It is of paramount importance that the UK ecosystem provides an environment for companies to access necessary support to innovate, which can be aided by the existence of life sciences clusters. If all the pieces are in place and are accessible, industry growth will likely follow due to the benefits already existing in the market; such as the charity sector and government initiatives. Then the UK will be best positioned to meet its own ambitious targets.

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Aerial view of Alderley Park

ABOUT ALDERLEY PARK

Alderley Park is the UK's largest single-site life sciences campus and has a global reputation for pioneering innovation. It is home to a growing community of over 200 biotech businesses and research organizations. The site features more than 1m sq. ft of high specification lab space, a range of scientific services and the Accelerator business support programme which enables businesses to start and scale.

Part of the Bruntwood SciTech network of innovation districts, Alderley Park also has strong connections with the oncology research community in the Manchester area, which includes the Christie Hospital; one of the world's leading cancer hospitals. Alderley Park itself is home to the AMR Centre, which is leading UK efforts to tackle the global health crisis around antimicrobial resistance, and the Medicines Discovery Catapult.

One of the UK government's three new Lighthouse Lab COVID-19 testing facilities is now based at Alderley Park – constructed through a partnership between the Department of Health and Social Care, Medicines Discovery Catapult, UK Biocentre and the University of Glasgow. Their development is being closely supported by both the NHS and Public Health England.

In recognition of the growing convergence between life sciences and the digital, big data and healthtech sectors, Alderley Park was recently expanded with the opening of the 150,000 sq. ft Glasshouse building. It offers a state-of-the-art workspace for innovation-focused companies.

The 400-acre site is set in Cheshire parkland and features a wide range of amenities including a conference centre, gym and outdoor sports pitches. The Park also benefits from unrivalled 100GB connectivity, Enterprise Zone status, and is part of the Cheshire Science Corridor.

Alderley Park is easy to reach by road, rail and air – the North's global gateway, Manchester Airport is less than 30 minutes' drive whilst a dedicated Park shuttle bus serves the local train stations.

If you would like to find out how Alderley Park can help your business innovate and grow, please contact:



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