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Anne Lane, UCL Business

STRATEGY

MIND THE GAP

By Karen Tkach, Staff Writer

A wave of initiatives and funds in the U.K. over the last two years has been flooding the gap between the country's prolific scientific achievements and its comparatively low rate of commercialization. The hope is that by connecting translational academics with sorely needed early capital and industry expertise, stakeholders can drive the creation of a self-sustaining ecosystem, and push universities towards spinning out newcos rather than routinely licensing their discoveries to pharmas.

The sector appears poised for an upswing, after a checkered history that saw an early burst of enthusiasm peter out when some high-profile companies ran aground.

“The basic story about biotechnology in the U.K. was a reasonably promising start in the 1980s and 1990s, when a number of new firms were created, and venture capital was going into the sector on a reasonable scale,” said Geoffrey Owen, a management professor at the [London School of Economics and Political Science](#) (LSE) who recently surveyed the U.K. biotech industry. “Then came a whole series of setbacks at the end of the 1990s and early 2000s when several of the highly promising firms failed.”

Notable among them was [British Biotech plc](#), a company developing therapeutics for cancer and cardiovascular disease whose high-flying stock plummeted following a whistleblower's allegations that the company had misrepresented the progress of its compounds. In 2003, British Biotech merged with [Vernalis Group plc](#) to form [Vernalis plc](#).

While biotech languished for over a decade, rumblings of life that began about five years ago have been picking up speed. What could be the difference-maker this time around is that

the momentum is fueled by three independent forces that are starting to converge: government initiatives, investor interest, and new translational organizations involving some of the country's top universities.

A key component, said several stakeholders, will be the ability to promote entrepreneurship among academics and engage the universities in spinning out companies from their assets.

They noted that while the culture shift towards translating discoveries, and not viewing industry as the “dark side,” is increasingly taking hold, there has been a trend to license out discoveries rather than use them to found new companies.

“I think there are more companies in the U.S. centered around one therapeutic or a platform, whereas the approach we would tend to take here, unless the academic expressly wants to spin out, is to license it,” said Anne Lane, executive director of [University College London](#) (UCL) Business plc.

Owen said that is partly due to lack of precedent. “There haven't been enough successes. The number of academics who have started companies and made a lot of money off them serving as role models is very few compared with Boston or San Francisco.”

According to Annalisa Jenkins, CEO of [Dimension Therapeutics Inc.](#), another barrier has been the lack of venture funding for early stage companies.

“There's not enough risk equity capital in the U.K. that's prepared to go in at the A round, and so academia in some cases is just left to go and directly partner with pharma,” Jenkins told BioCentury.

Jenkins is also a board member at [MedCity Ltd.](#), a collaboration set up in 2014 between the Mayor of London and three of the capital's academic health science centers — Imperial College Academic Health Science Centre, King's Health Partners and UCL Partners — to bring stakeholders together with the goal of boosting economic activity and translational development from biomedical organizations.

MedCity is one of a crop of recent bilateral or trilateral collaborations between government, investor and academic organizations in which the partners see both self-serving and broader benefits to collaborating.

“From the political side, the government of London was looking at how life sciences could support the economic growth of

London. From the academic health science centers' perspective, they thought there was a real opportunity for them to work together to promote the translation and industrial engagement agenda,” MedCity CEO Sarah Haywood told BioCentury.

COMEBACK KID

According to Rick Fagan, director of BioPharm at UCL Business, not-for-profit and research foundations were the early drivers of the recent push to commercialize translation in the U.K.

“The first to address it in a significant way were the [Wellcome Trust](#), who started a translational funding stream back in 2006,” he said. “The MRC then really jumped into the ballgame,

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SET TO LAUNCH

The U.K. government's technology strategy board, renamed Innovate U.K., has created a Catapult Programme composed of 11 centers, each focused on accelerating a different technology sector. Its three life sciences-focused centers — the [Cell and Gene Therapy Catapult](#), the Precision Medicine Catapult, and the [Medicines Discovery Catapult](#) — are helping the country's academics and companies overcome barriers to successful commercialization of their science.

“It might be lack of knowledge, lack of support, or that there isn't enough track record in the environment for people to feel confident about what the outcomes of their efforts would be,” said Matthew Durdy, CBO of the [Cell and Gene Therapy Catapult](#), which was founded in 2012.

The organization keeps a database of U.K. research in the cell and gene therapy space, advises early stage researchers on translational strategies and helps later-stage groups navigate the waters of commercialization.

“When they've established preclinical proof of concept and are showing some good potential, we'll come in with a very brief interaction that helps them line up what they're doing for the best commercial opportunities” by advising researchers to consider factors such as target patient populations and competition in their space, he said. “Then, when they get two or three years away from the clinic, that's where we kick in, and our involvement increases dramatically” by helping academics or companies with issues like regulatory

compliance, market analysis and manufacturing.

In addition, the group operates a U.K. manufacturing facility to help domestic and international companies get local production of cell and gene therapeutics up and running.

The Precision Medicine Catapult, founded in 2015, has similar goals. “We have been working hard to make the U.K. the destination, certainly in Europe, for conducting precision medicine, but also assisting in the development of next-generation diagnostic companies that are exploiting precision medicine advances,” said Richard Barker, the center's chairman.

He said the group can help connect emerging companies with resources including funding, regulatory science support and health economics input. “We can help them develop the business case which they have to take to payers, whether the technology be diagnostic, therapeutic or digital.”

Barker said the Precision Medicine Catapult will announce the first round of technologies it plans to support in the coming months.

The Programme's newest addition, the [Medicines Discovery Catapult](#), was announced in July 2015 and launched last month. The group will provide technical, regulatory and financial guidance to accelerate drug development in the U.K.

— Karen Tkach

probably about two or three years later. And that has really, really made a significant difference in the U.K.”

Since then, the government has made boosting biotechnology a national priority by creating funds and organizations to support the translation of academic research, and appointing former biotech VC George Freeman as the first-ever Minister for Life Sciences.

In 2010, the government’s innovation agency [Innovate UK](#) launched the Catapult Programme, whose goal is to bridge the gap between the U.K.’s scientific and commercial outputs. Of the Programme’s 11 centers, three are focused on specialized areas in biotechnology: cell and gene therapies, precision medicine, and drug discovery (see “Set to Launch”).

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Annalisa Jenkins, Dimension Therapeutics

[Innovate UK](#) also collaborated with the [Medical Research Council](#) (MRC) to launch the Biomedical Catalyst Fund in 2012, which provides funding for companies and academics to de-risk and commercialize their discoveries.

Christopher Watkins, director of translational research and industry at the MRC, told BioCentury that the government’s publication of a life sciences strategy five years ago was an important milestone. “It sent the signal that the government was very serious about the life sciences in the U.K.”

He added that investments from MRC and [Innovate UK](#) were part of an overarching strategy to enable the organizations to work together so that “the best ideas coming out of academia or industry could be supported to the point at which they become viable propositions for substantial funding from other sources, such as venture capital.”

That venture money is starting to show up, in large part from new funds rooted in the universities themselves (see “Venturing into European Academia”).

In the last 18 months, almost \$1 billion (£648 million) in new translational development funds was raised in Europe; of that, three quarters was from U.K.-based funds. That included £320 million (\$459 million) from Oxford Sciences Innovation plc, £70 million (\$100 million) from [Cancer Research Technology Ltd’s](#) CRT Pioneer Fund, £50 million (\$72 million) from the UCL Technology Fund, and £40 million (\$57 million) from the Apollo Therapeutics Fund.

The Apollo Fund — a joint venture uniting the tech transfer offices of UCL, [Imperial College London](#) and the [University of Cambridge](#), together with [AstraZeneca plc](#), [GlaxoSmithKline plc](#) and [Johnson & Johnson’s](#) J&J Innovation unit — was set up to help those universities develop assets to a point at which they can either be developed by one of the pharma partners or be out-licensed.

However, LSE’s Owen believes rising interest from U.S. investors is also buoying the upswing. “In 2014 and 2015, there seemed to be quite a revival of private sector interest in biotech, and an increase in investment in U.K. biotech from the U.S.”

Stakeholders who spoke with BioCentury said attracting U.S. venture money will continue to be important to the comeback because U.K.-based investors are generally less drawn to the high-risk profile and long timelines of early stage biotech investments.

“The risk profile of biotech doesn’t necessarily suit the goals of the venture investors in Europe and the U.K. And my experience is, with the exception of a few funds — Abingworth, Syncona Partners, [SV Life Sciences](#), and [Edmond de Rothschild Investment Partners](#) for example — because they’re diversified, a little bit more generalist, they are not likely to invest in early, early phase,” said Jenkins. “That is not good for the translational, academia-to-commercial space. But I think it’s changing.”

According to Haywood, part of MedCity’s brief is to bridge that divide.

“One of the things we’ve been working to develop is a healthcare and life sciences-focused angel investing program,” she said. “At the other end of the spectrum, we’ve been working with the London Stock Exchange to help to get institutional and generalist investors interested in the sector.”

Tony Hickson, managing director for technology transfer at [Imperial Innovations Group plc](#), said that was also part of the motivation for setting up the Apollo Fund.

“We really believe that there is lots of great science, and more of it could be translated if we can get access both to the capital, the

right models, and the right expertise, so the right experiments and the right development path is taken,” he said.

KNOW-HOW NOW

Investors and government stakeholders believe that success will depend, beyond the money, on growing competencies by putting academics in direct contact with experts in drug development, regulatory affairs and commercialization.

“We all bear the scars of some brilliant innovations being progressed, but when we’ve gone to engage with industry, we’ve been told that it’s a great idea, but the type of experiments that industry expects to see haven’t been done yet,” Hickson said.

According to Matthew Durdy, CBO of the [Cell and Gene Therapy Catapult](#), increasing know-how among academics was seen as key for engaging them actively in the commercial side of research. “The U.K. government said, ‘this is a whole institutional gap; it’s not about money, it’s about capability.’ So they set up the Catapult Programme to bridge that translational gap,” he told BioCentury.

The model for using translational organizations as accelerators has become part of the biotech scene in the U.S., and several pharmas, including local U.K. giants GSK and AZ, believe there’s a benefit for them to participate as well.

Ian Tomlinson, a former GSK VP who is chairman of the Apollo Therapeutics investment committee, said the Apollo Fund is creating a dedicated drug development team of pharma experts to help academics apply for the funds and develop their projects if selected.

“These people will go into the universities, spend time with the academics working up a project plan trying to determine what can be done,” Tomlinson said. “You want to bring to bear pharma’s scientific expertise into the academic project as early as possible.”

In addition, the [Francis Crick Institute](#), whose central facilities will open this year, has built what COO David Roblin calls “close-distance translation” into its research strategy. Roblin previously held leadership roles in pharma, and is also on the board of MedCity.

“What I’m going to do is bring applied scientists into the Crick,” Roblin said. “These are industrial scientists, and potentially VC entrepreneurs, who will work within our laboratories to help do great science, but also identify science that is potentially translatable. They can’t be a separate division or team in a corner of the institute. They have to be part of a group leader’s laboratory.”

As part of this effort, researchers from the Crick participated in a retreat with GSK scientists, and have launched collaborations with GSK and other pharmas.

But Roblin hopes to foster a variety of collaboration models. “I just want enough capability flowing in through the Crick in the laboratories, in the canteen, in the seminars, such that translation is always a question.”

And while the big picture economic goal is to spur company creation, which means encouraging entrepreneurship among academics, MedCity’s Haywood believes that promoting activity on all fronts is the best strategy.

“I think the biggest gap for the U.K., and for any European country, is to grow those spinout companies into real global forces.”

Richard Barker, Precision Medicine Catapult

“We are really keen to support translation in all of its forms, whether it be encouraging spinout activity or start-up activity from the academic space, encouraging translation of academic research through industrial partnerships and collaborations, and through trying to encourage more clinical trial activity in London,” she said.

GROWING PAINS

However, stakeholders also said attention will soon need to turn to ensuring that the companies formed are robust enough to grow.

“The bridge has not been built from academia to that vibrant B round-type company, because the model hasn’t been fully established yet,” Jenkins said.

Richard Barker, chairman of the Precision Medicine Catapult and director of the Centre for the Advancement of Sustainable Medical Innovation, agreed that maturing small companies is the sector’s looming challenge.

“I would like to see even more academics motivated to create companies, that’s a good thing. But I think the biggest gap for the U.K., and for any European country, is to grow those spinout companies into real global forces,” said Barker.

According to Owen, **Circassia Pharmaceuticals plc** was a rare example of a U.K. IPO success. Only a handful of companies have made big splashes on the public markets, while many have yet to prove themselves in the clinic, he said.

“Quite a lot of hope has been invested in that company, and the hope was that more early stage companies would follow its example, and that hasn’t really happened yet,” said Owen.

He added that while a few mid-sized companies like **Adaptimmune Therapeutics plc** and **Immunocore Ltd.** are thriving, they are few in number, and that’s perceived as a weakness for the sector.

“I think there’s a sense in this country, where a lot of our older industries have faded away, that the life sciences industry is one in which we should do well, because we have good science in our universities, and it ought to be the basis of a reasonable array of medium-sized companies that stay independent for a long time, employ people in the U.K., and create a more balanced life sciences industry than one that is dominated by two very large companies,” Owen said. ■

COMPANIES AND INSTITUTIONS MENTIONED

Adaptimmune Therapeutics plc (NASDAQ:ADAP), Abingdon, U.K.
AstraZeneca plc (LSE:AZN; NYSE:AZN), London, U.K.
Cancer Research Technology Ltd., London, U.K.
Cell and Gene Therapy Catapult, London, U.K.
Centre for the Advancement of Sustainable Medical Innovation, Oxford, U.K.

Circassia Pharmaceuticals plc (LSE:CIR), Oxford, U.K.
Dimension Therapeutics Inc. (NASDAQ:DMTX), Cambridge, Mass.
Francis Crick Institute, London, U.K.
GlaxoSmithKline plc (LSE:GSK; NYSE:GSK), London, U.K.
Immunocore Ltd., Abingdon, U.K.
Imperial College Academic Health Science Centre, London, U.K.
Imperial College London, London, U.K.
Imperial Innovations Group plc (LSE:IVO), London, U.K.
Innovate UK, Swindon, U.K.
Johnson & Johnson (NYSE:JNJ), New Brunswick, N.J.
King’s Health Partners, London, U.K.
London School of Economics and Political Science (LSE), London, U.K.
MedCity Ltd., London, U.K.
Medical Research Council (MRC), London, U.K.
Medicines Discovery Catapult, Cheshire, U.K.
Oxford Sciences Innovation plc, Oxford, U.K.
Precision Medicine Catapult, Cambridge, U.K.
UCL Business plc, London, U.K.
UCL Partners, London, U.K.
University of Cambridge, Cambridge, U.K.
University College London, London, U.K.
Vernalis plc (LSE:VER), Winnersh, U.K.
Wellcome Trust, London, U.K.

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