Drugs&Dealers magazine

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FEATURE: Science without boundaries: The Crick Institute's bold new approach to translation

David Roblin of The Crick Institute outlines the institute's and his role in identifying and developing translatable science

Tech Transfer: accelerating the journey between concept and commercialisation

Unique insights from Imperial Innovations, Isis Innovation, Edinburgh BioQuarter, UCL Business and Cancer Research Technology

The (next) Generation game: supporting world-class bioscience research

Celia Caulcott of BBSRC and Richard Seabrook of The Wellcome Trust talk knowledge exchange, commercialisation and translational funding

Turning IP into a commercial reality

Simon Portman of Marks & Clerk LLP and Jackie Maguire of Coller IP discuss the necessary evolution of developing investable assets

It's never too early: rethinking bioscience engagement

Patrick Verheyen of J&J Innovation London and Malcolm Skingle of GSK discuss their unique approaches early stage collaborations

Finding, funding and fuelling exciting early stage bioscience

Allan Marchington of Apposite Capital offers his views on the investment landscape and the key to successful investments

Banking on biotech: a prescription for alternative financing

Nooman Haque of Silicon Valley Bank talks financing trends and the increasing role of venture debt

Tackling Translation

The Tech Transfer and Translational Funding Issue

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Dear Reader,

We are witnessing a global revolution in the translation of great science. Pharma is engaging with the science a lot earlier, pre-competitive collaborations are blossoming and an era of Open Innovation is being heralded. Technology transfer organisations are being forced to evolve and new exciting models of commercialising life science technology are emerging from the likes of Imperial Innovations, Wellcome Trust and The Francis Crick Institute.

In this issue of Drugs & Dealers, we interview the movers and shakers in the world of technology transfer and early stage funding. We explore the key success factors in collaborations, how TTO's are answering their critics, the vital role of IP, how early stage bioscience companies can access funding and become investable and much, much more.

I hope you enjoy it!

Yours,

Terence O'Dwyer & Neil Darkes


Terence O'Dwyer


Neil Darkes

P.S. On Sept 4 in London we are holding an evening drinks reception and panel that will feature many of the interviewed executives in this edition. Please do sign up at: **www.biotechandmoney.com/events/batctechtransfer/**

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Contents

Executive Interviews

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Feature: Science Without Boundaries: The Crick Institute's Bold New Approach to Translation

Dr David Roblin, COO, The Francis Crick Institute

The Francis Crick Institute is pursuing a bold and audacious research and translation strategy that it hopes will put British science on a different level to any other globally competitive institute. We quizzed David Roblin, ex-Head of European R&D at Pfizer and an experienced biotech executive, who has been appointed as the institute's new COO and Director of Translation, on the Crick's novel approach, how it intends to overcome its challenges and what he feels are the key success factors for translation.

B&M: David, can you begin by summarising the mission and purpose of the Francis Crick Institute?

David Roblin: Our core mission, described in our strategy, Discovery Without Boundaries, is to make scientific breakthroughs in the understanding of human pathophysiology.

The Crick won't be just a biological institute, it will be a multi-disciplinary institute, with chemistry, physics, engineering, mathematics, computing and also industrial science at its heart - a blend of different abilities applied to that central question of understanding human pathophysiology. Our aim is to translate our research into patient benefits and to generate economic opportunities for the UK.
We also have a role to play in creating future science leaders who will then move on to other institutes and universities.

And lastly we aim to make science more accessible to the public, which our building and central London location will provide superb opportunities to do.

B&M: Collaborations are clearly critical, could you elaborate a little bit on how that will work and what make them unique at the Crick?

David Roblin: The Crick's founding partners are six of the world's most influential and respected scientific organisations: the Medical Research Council, Cancer Research UK, the Wellcome Trust, UCL (University College London), Kings College London and Imperial College London. This unprecedented collaboration will be vital to the success of the Crick's interdisciplinary approach to science. We will also consider collaborations with others that offer capabilities and expertise that we don't have within the Crick. This will include the venture community, biotech, and big pharma.

B&M: Tell me about your role particularly? You're the COO and Director of Translation. What does that actually mean?

David Roblin: As COO I'll ensure that the Crick runs efficiently, the science platforms work effectively, and that we accommodate world-class science. As Director of Translation I will focus on the scientific agenda, identifying and developing translatable science.

B&M: What do you think are the biggest obstacles to delivering that?

David Roblin: Traditional biological institutes have not systematically dealt with translation - their vision is the understanding of basic science, not necessarily the application of that to generate health and wealth benefits. Our biggest challenge is to engender the culture that asks the question: 'how can my science be applied?' Then to develop the skills and resources to allow that journey to begin.

B&M: What steps are you taking to engender that culture?

David Roblin: I need to say this is a long-term plan. It won't happen overnight and is difficult to do. Few institutes have been very successful. Translation is a very different discipline, and we will need to work on mechanisms, culture, and support for our scientists to ask those questions of applicability. So I want to see skilled practitioners, some from the venture background, some from biotech, and some from big pharma, working with our scientists.

I also want to recognise those scientists who are doing translational science well - there are already a number at the Crick's founding institutes (the Medical Research Council's National Institute for Medical Research and Cancer Research UK's London Research Institute). I envisage seminar series and subject matter experts to help others start the journey of translation.

The scientists I speak to are keen that their science translates into patient benefits and the issue is often skills and time to do this. We will seek to address this.

> "Valuation is probably less important than getting a partner who's got the capacity and capability to drive the science forward. In any technology transfer that we engage in, that will be our primary concern"
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B&M: How are you going to ensure that you capitalise and exploit the IP that's generated at the Institute and turn that into commercial viability?

David Roblin: The first thing is an understanding of where IP really is of value. That sounds like an obvious point but I don't think it's always considered carefully enough. Most of the IP in the industry concerns composition of matter, not around scientific insights or even medical uses. And actually patents are filed rather late in the process of translation, so the basic understanding of pathophysiology is non-exclusive. My view is it's best practised in an open manner bringing to bear many disciplines and skills, including those of industrial scientists. IP and exclusive relationships can hinder this engagement.

Clearly IP and patents are important and without them we won't get the investment to turn projects into commercially successful collaborations. We will therefore need to recognise when there are particular insights that are novel and so can form the basis of IP and a patent claim. That's usually later in the process of translation, and where we'll need to be astute within the institution and with our open science collaborators to recognise the need for protection and patents.

The role of translation in the Crick will be to accelerate our science programmes. Commercial valuation is less important than getting a partner who's got the capacity and capability to drive the science forward. In any technology transfer that we engage in, our primary concern will be whether the collaborator is fully committed to the IP and are bringing resources to bear that will move things forward. It's important that we get value for money but our focus will be to accelerate our science.

B&M: How are you going to bring the necessary level of commercial rigour to the Institute without compromising the intellectual and academic freedom that is traditionally associated with these institutes.

David Roblin: The Crick is about scientific discovery. Curiosity-driven research is its focus. The translation strategy will recognise that to get a third party interested in funding and moving the science forward there needs to be a business plan detailing next steps, how to reduce risk, the level and timing of investment required, and what the commercial opportunity looks like. But ultimately the best quality science will govern what we do.

Turning the question on its head, if you are over-reliant on commercial value to drive decision making, you risk doing science that is not high quality.

B&M: If we turn now to the funding side of things, what is The Crick's view and strategy on funding? How are you going to help fund the development and commercialisation of translatable science?

David Roblin: We've got generous, supportive founders who are terrifically committed to the Crick's strategy. They have provided capital funding for the building and will provide operational funding for the institute. Our scientists will also apply for grants and awards.

The translation agenda will be part-funded through these sources; however, when we have a translatable opportunity we will look to collaborate quite early. That could be collaborating with the HEIs and working within their academic health centres for example. And of course collaborations with a biotech or big pharma will be important too.

B&M: The availability of capital is obviously one of the biggest issues facing biotechs. What are the specific relationships that you're cultivating and building to help address that need?

David Roblin: We are finalising the translation strategy. It will envisage the involvement of venture capitalists, biotechs and pharma in the translation process at the Crick. We may have entrepreneurs in residence - experienced biotech entrepreneurs who are looking to create new companies, looking to identify science that could form IP - to help our senior scientists think about how they might apply their science.

B&M: How do you see the role of the relationship between pharma and The Crick Institute?

David Roblin: Pharma is a key part of the process of translation, as it offers complementary different skills and expertise to those at the Crick. Pharma will bring an applied science mindset that is used to taking something into the clinic and into phase 2 for testing. Pharma has assays, chemical and biological probes and platforms that can help us prove our science quicker.

So I'm envisaging the sort of collaborations that you'd recognise and expect, as well as others that take advantage of open science. This means saying we're working together to advance science in the first instance and we're looking for a mix of curiosity and applied science in an interdisciplinary approach to scientific understanding. This is something which really hasn't been achieved previously and could be unique.

B&M: Do big pharma and other industry stakeholders share this vision you described?

David Roblin: Some do, but not yet all. The philosophy is understood. For me it's a natural extension of the pre-competitive arena and it could benefit us all. Institutes such as the Crick are well placed to do this and I do hope we manage to achieve a good mix of this open science with industrial involvement. It's part of the bold audaciousness of the strategy which is not to do something that's been done before, this is about doing something that's quite different that puts British science on a different level.

B&M: Let's talk about the industry as a whole. Is there anything in the wider healthcare industry that is really concerning you at the moment?

David Roblin: To take a UK-centric view for a moment, the Crick's research agenda, the magnificent institute we're going to build, and the insights and science it's going to generate will require a supporting eco-system to maximise our impact. The availability of capital, entrepreneurs and big pharma to drive ideas forward and benefit patients and the UK economy is critical. When you see the potential for big mergers and acquisitions (such as the recent Pfizer bid for AZ) the thing that worries me most is whether there is a commitment to maintaining industrial R&D capability, capacity, and importantly leadership in the UK - in a sense that's almost more important than which company is driving it.

B&M: What are the specific threats to that? What do you feel are the biggest threats to developing that eco-system?

David Roblin: The biggest threat is probably being a bit too British about it! Let's be audacious, fully commit and make it happen. It's absolutely clear that there is a significant amount of great science in the UK. And our politicians are committed to life sciences being successful in the UK.

B&M: What about the availability of capital for translation?

David Roblin: I've got faith in the notion of capital following ideas. Perhaps in the past we've just not been good enough in describing the opportunity and convincing people that if the opportunity exists then the skills and capability exist in the UK to drive it forward. If we can do that better then the capital will come.

B&M: Are you broadly optimistic then for the prospects of UK biotechs?

David Roblin: I'm hugely optimistic. At a personal level, that's why I remain in the UK and Europe, and didn't go to the US. We've got some of the greatest science, we've also got some of the greatest companies. Many of the world's best medicines came from these shores. There is the political will and commitment and that's demonstrated by the level of investment in the Crick from science funders.

B&M: If you had to sum up the key success factors to translation, what would you say they would be?

David Roblin: If we're talking about science it's to get into the human model as quickly as possible! Use human models, organism, tissue, cells as early in research as possible - closer to the scientific discovery that happens in the laboratories. In a sense it's reverse translation, it's making human tissues and cells more available for testing. It also means getting to people in the clinic early if you can, because you get insights there that you wouldn't get from any other species. As we design any translational programme, this has to be important.

I'd also point out that one shouldn't over process things. You need some governance but frankly above all you need to be entrepreneurial and opportunistic. We need to measure science moving forward but it's not through one simple set of milestones.

Follow outstanding science, commit and be optimistic ■

From Technology Transfer to Technology Development: The future of TTO's

Tony Hickson, Managing Director, Imperial Innovations

Tony Hickson is Managing Director of Technology Transfer at Imperial Innovations. He talks to us about a new paradigm in technology transfer, what TTO's need to do to adapt and evolve, and what he thinks the future holds for the industry.

B&M: Tony, explain to me your role here, what it is you do.

Tony Hickson: Imperial Innovations creates, builds and invests in pioneering technologies developed from the academic research of the UK's four leading Universities. I'm the Managing Director of Technology Transfer and lead a team focused exclusively on commercialising intellectual property developed at Imperial College London.

Innovations is the technology transfer office for Imperial College London and we have a technology pipeline agreement under the terms of which we have first rights over IP generated by the College and its staff. Innovations also acts as the technology transfer office for select NHS Trusts linked to Imperial College London, including Imperial College Healthcare NHS Trust and North West London Hospitals NHS Trust.

B&M: What does this mean on a day to day basis?

Tony Hickson: We engage with the academic community and support them in the commercialisation of their ideas. This commercialisation process commences with a detailed review of invention disclosures made by scientists, with the aim of identifying technology having potential commercial merit. Following this review, we develop an intellectual property strategy, invest in patent protection, carry out market research and seek to validate technology through proof of concept studies.

Once this essential early groundwork has been completed, and presuming outcomes are favourable, a decision is then taken as to the best way of commercialising particular intellectual property.

There are many ways of commercialising a new technology, but the main two we deal with are licensing to industry or forming a new company and building a business around it.

B&M: Let's talk about tech transfer. Why is technology transfer in itself so important for innovation and if we're talking about the UK bioscience eco system, why is technology transfer so important to the UK in particular right now?

Tony Hickson: It's the assistance we are providing to the universities and inventors in getting their technology out of the lab and into society. You often hear people lament that the UK is really poor at this but I don't believe that's true anymore. The UK is actually very good at technology transfer and good at getting technologies out of universities and into the hands of industry partners that can develop products from them. Of course, technology transfer offices are not

> Increasingly tech transfer offices are becoming technology development organisations, in that they will take good ideas and help to develop them, de-risking them and managing them as projects.
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the only means of achieving this. Other modes include: consultancy, industrial collaboration or just dissemination through publication, all of which are useful ways of getting ideas out of universities and into society.

Technology Transfer offices such as Imperial Innovations play an increasingly important role in helping both the Universities and the founding academics to ensure that their intellectual property is in the best possible shape for commercialisation, be that through licensing or the formation of spin-out companies.

Nonetheless we can get better and we're certainly not resting on our laurels...

B&M: When is tech transfer best suited?

Tony Hickson: Technology transfer is intended for when the idea actually exists – when an experiment has been done or a prototype has been built or there is solid data generated. IP rights can be used to protect the idea and this means you have an asset that can be valued and traded in the same way that small biotech companies routinely trade their IP with pharma companies. There is often some confusion between the term 'technology transfer' with structuring research collaborations which are far more complex. For example in a collaboration you are trying to create something in the future together and have the additional complexity of overhead rates, liability and future IP that may arise but is very hard to value now.

B&M: How is tech transfer changing?

Tony Hickson: What I would say is tech transfer has changed and the old days of taking an asset out of a university, protecting it and trying to flip it to industry is now a bit out-dated. Increasingly tech transfer offices are becoming technology development organisations, in that they will take good ideas and help to develop them, de-risking them and managing them as projects. This work is far more extensive and may involve putting in place proof of concept funding to build prototypes, applying for translational grants (which are provided by funding bodies with the specific aim of turning early stage research into something of commercial potential) working alongside academics and moving technology up to a readiness level where industry will start to engage with it or it can be spun out into a new business. Tech transfer is more developed than it was 10 years ago, with more and more experienced people coming out of industry and working in tech transfer offices. Tech transfer offices are also better resourced and able to bring in expert external advice and construct proper valuation analyses.

B&M: Does this new model of tech transfer have prominence across the country or is it something that is particular to Imperial?

Tony Hickson: It's across the country and it's been massively assisted by the government - for example via Higher Education Innovation Funding (HEIF) which was set up to support and develop a broad range of knowledge-based interactions between universities and colleges and the wider world, with the aim of generating economic and social benefit to the UK. Research Councils, charities and organisations such as the Technology Strategy Board (the UK government's innovation agency) are also important, especially in the healthcare sector, as they provide translational grants to bridge the gap that exists between the early stage of our technologies and what industry actually wants. Along with a greater understanding of Industry needs, increased access to such translational funding has helped to change the mind-set of tech transfer practitioners and we've begun to equip ourselves with a broader, deeper and more commercial mind-set.

B&M: How do you see it evolving from here? What's the future for tech transfer?

Tony Hickson: I'd say TTOs where possible need to continue towards becoming technology development organisations. To achieve this, offices will need to equip their staff with more business and project management skills and bring in more external

consultants more often to provide expert advice at an earlier stage. The skills necessary for protecting and licensing IP are not sufficient alone. The management of a drug development project, for example, is a skilled undertaking and we need to provide help and support to academics so that they can progress in the most efficient way. For example, if an academic is going to develop an early stage therapeutic, our job is not just to help them manage that project, but also to make sure they're surrounded by experts who can help advise them to do the right things and maximise the chance of that therapeutic drug being attractive to industry. This is important because whether the academic is interested in commercialisation process or not, they do understand that in order for their innovation to benefit patients, it needs to be attractive to industry partners.

B&M: What would you say is a big challenge facing tech transfer at the moment?

Tony Hickson: A perennial issue is the perception that TTOs overvalue IP, and I'm not sure there is a simple solution. Part of the problem comes from a misunderstanding of what tech transfer is when compared to research collaborations, and the two terms regularly are conflated in discussions with industry. Tech transfer, in its purest sense, is the trading of intellectual property assets, and, in that sense, it is a function of valuing your IP assets and seeing if industry agree on that valuation and attempting to come to an understanding. Our experience is that deals very rarely fall down on valuation issues. We take professional advice and run our NPV analyses, Industry run their own, there's a negotiation, we start at different places and nearly always you come to a consensus. I can only remember two straight IP asset licensing deals in 10 years that foundered on the basis of an inability to agree the valuation. The IP valuation is not actually the impediment everyone seems to believe it is.

With research collaborations there tend to be more 'failure points'. They are multi-factorial and more complicated because you've got the overhead rate, i.e. the amount the industry is being asked to pay and you've got future IP to deal with, as well as any existing background IP coming in. You've also got the level of involvement of the academic versus the level of engagement of the sponsoring company. All of these those factors combined lead to a more complex environment and a different view of the inherent value of the IP. This can lead to a disconnect in the discussions, with universities struggling to value their IP in the context of these complex research collaborations, which then rubs off on tech transfer offices.

B&M: You mentioned earlier that you often hear people lamenting the state of technology transfer in this country. Why do you think that is? Why is there this negative feeling towards it?

Tony Hickson: I'm not quite sure why it is. Some of it is historic, it's legacy, it's a perpetuated myth and people have not yet come to terms with the fact that tech transfer is in a different place now compared to 10-20 years ago. It's incumbent on the tech transfer profession to prove themselves and dispel this myth.

B&M: What does the TTO need to do to change this perception to a different outcome?

Tony Hickson: Continue to publicise the deals that we're all doing. The ability to demonstrate lots of transactions occurring with industry and venture capital funded start-ups means we must be coming to an understanding during negotiations and therefore we must be doing something right; we're transferring technology out into the environment which achieves impact and benefits society.

B&M: What do you think makes for a really productive technology collaboration? What are the key success factors?

Tony Hickson: My view on successful technology collaborations is that they require an alignment of interests right at the very start. If, when you start out, your interests are aligned, the industrial partner is very clear about what they want to achieve and the academic is very clear what he or she wants to get out of it, then it tends to end up with a deal and success.

B&M: How important is your role in the wider collaboration?

Tony Hickson: Our job is vital - we have to go out there and engage with the academic community, talking to inventors all the time, understanding their research and where they're going.

We engage in two different ways. We can be reactive, when a researcher comes to us and tells us about their work, and we respond, assess it and decide with them whether to take it forward. We are also proactive: we will run seminars in departments at Imperial and meet with researchers who might never have spoken to us about their work and try to gain an understanding if we think they're doing interesting research – even if commercialisation might be years in the future.

B&M: In helping academics commercialise, do you help put together management teams for example?

Tony Hickson: Absolutely, yes, that's become one of the biggest changes that's evolved in our business since around 2006. There is an increasing emphasis on bringing in management very early to engage with the academics. It happens in spin-outs but it can also happen before that with our translational projects. We have entrepreneurs in residence, people that we bring in to scout around the university and meet with academics in certain sectors, with a view to identifying good ideas which they can then help the academic to bring out of the university.

The other big lesson for us is that not everything has to start with IP. In tech transfer you can become patent obsessed and certainly we've learnt that good, high quality propositions can develop from just great science and great minds. Strong, well-defined IP might develop from that sort of interaction – but it might not be there right from the beginning.

B&M: What piece of advice would you give to an academic or inventor who was thinking about approaching a technology transfer office and how would you tell them to approach it and what would you tell them to expect?

Tony Hickson: It's never too early to approach the tech transfer office. Some academics are worried that we might turn them away because their idea is too early or unformulated, but we are not looking for fully formed concepts. Our strategy is to work with the academics to develop an exciting idea and to turn a concept into a commercial proposition. If it needs working up we can help them to develop it further, secure appropriate funding, bring in specialist advisers and to track a project throughout its development. Of course, having done a little bit of prior market research via the internet to think about where your idea may be used helps, but the bottom line is that it's never too early to approach us with your ideas.

B&M: Where do you see the biggest opportunity for Imperial Innovations as far as tech transfer is concerned?

Tony Hickson: It's a really exciting time for tech transfer at the moment because the community interested in technology commercialisation has widened, following a strong push from government and funders to demonstrate the impact of British research on society. Furthermore, students are paying more to study and want a richer experience at university with involvement in entrepreneurship seemingly a major part of that for some. Entrepreneurial students increasingly expect access to mentors and networking evenings with major investors. They want to be able to pitch their ideas both as a preparation for their future careers and also as an outlet for and increasing engagement with an entrepreneurial ethos. As a result we are broadening our engagement, providing a richer, more proactive engagement with the wider academic and student community within Imperial College and we are learning a lot by doing so! ■

Inside Isis Innovation: Talking Tech Transfer

Linda Naylor & Adam Stoten, Isis Innovation

Linda Naylor, Executive Director and Head of Technology Transfer and Consulting, and Adam Stoten, Deputy Head of Technology Transfer at Isis Innovation are senior managers at one of the largest TTO's in the UK. They talk to us about the changing landscape for TTO's and how Isis is responding, the principal challenges they encounter and what is keeping them awake at night, their views on the common criticisms levelled at TTO's and their words of advice to key stakeholders.

B&M: Tell us a little about Isis Innovation. What are your core areas of focus?

Linda Naylor: Isis Innovation is a wholly owned subsidiary of the University of Oxford. In the Technology Transfer Group we are responsible for the commercialisation of research coming out of Oxford University, either through licensing or new spin-out companies. We work closely with colleagues responsible for divisional business development -- whose remit it is to attract commercially sponsored research-- and with the University's Research Services team who are responsible for managing the contractual aspects of Oxford's large research funding income.

Our philosophy has always been that we work with researchers who wish to engage in technology transfer and commercialisation. We do not go into university departments to conduct IP audits or push academics to engage in the commercial exploitation of their research results.

Also embedded in Isis is Oxford University Consulting (OUC), which manages the process of academics consulting out to external parties. OUC works with academics to negotiate rates and contracts when they are asked to act as consultants, and also works with external organisations to source relevant expertise from within Oxford's academic population.

Our 3rd business unit is Isis Enterprise (IE), an external-facing consultancy whose primary role is in helping other people – including other universities, governments and the private sector – to undertake technology transfer and related commercialisation activities. IE needs to be, and is, profitable and ultimately that profit is returned to the university.

B&M: How does Isis differ to other TTO's in the golden triangle and beyond? Where do you feel you offer greatest value into the way you approach your role?

Linda Naylor: We're lucky that we've been able to grow and achieve a critical mass within Isis. Compared to a lot of the other TTO's Isis is certainly one of the largest and best resourced. With this breadth and depth of expertise and resources comes the ability to do things a little differently. Importantly, we can attract well-qualified, experienced and innovative people, who are critical to successful technology transfer. With the right people

and the right resources we have been able to start new initiatives that Oxford wouldn't have otherwise seen, such as the Isis Software Incubator (http://incubator.isis-innovation.com/), the growing Isis Outcomes business (www.isis-innovation.com/outcomes/) and an award-winning initiative to help technology based SMEs become involved in technology transfer. It allows us to try out and implement new, more innovative concepts.

B&M: How have you witnessed technology transfer needs or demands changing over the last few years?

Adam Stoten: Without a doubt there has been a cultural shift in the university towards embracing innovation, entrepreneurship, and tech transfer more fully, which is great because it means we're engaging more with the academics. Compared to even a few years ago, there is a greater understanding of the value of tech transfer in generating impact through the uptake of new technologies and products.
All this is tied into the wider Impact agenda, which is now permeating right down to basic research funding; the need for academics to be able to demonstrate impact or at least the potential for impact.

Linda Naylor: I think, particularly in the bioscience area, industry is realising they do have to work much more closely with universities. Many years ago big companies like AstraZeneca wouldn't have even dreamt of looking at anything without clinical data. But now we're working with big pharma at a much earlier stage.

Adam Stoten: I think there's a move on the part of some pharmaceutical companies to look at research collaborations as a preferred means of accessing academic innovation, and generally to engage with academia using a much more diverse array of partnering models. They are not just sitting there waiting for the tech transfer office to serve up patented projects for them to pick up, they now want to get involved early on. We are also seeing as much activity around licensing enabling research tools (especially software) to big pharma as we are around licensing specific therapeutic candidates.

Linda Naylor: One of the major changes is that the complexity of technology transfer has increased greatly, especially regarding background funding and 3rd party rights to arising IP. Now collaborations are worldwide, so we must deal with funders different from the traditional UK research councils and major charities; for example an increasing number of projects receive federal funding from the NIH in the US. So to actually be able to transfer technology it's really quite a complex scenario now, trying to gather it all together, which is nothing like it was a few years ago.

B&M: What do you think are the principal challenges that are facing technology transfer offices today?

Adam Stoten: A persistent key challenge is achieving sufficient proof of concept for a technology such that we can find a commercial partner for it. The ability to attract the right people is also a challenge and we recognise that our business is critically dependent on us recruiting, developing and retaining a high calibre team. Lastly, building and maintaining constructive relationships with a wide range of stakeholders, often with very different views of the world, will always be both difficult and vitally important.

B&M: There have been several criticisms levelled at TTO's. One we have recently heard is that you don't fully understand what is required from a VC point of view. What do you think are the actual things that TTO's need to know about conducting business with VC's and investors?

Linda Naylor: I think you're right that we do sometimes hear those criticisms from investors. One point that seems to cause concern that we encounter with investors but is less prevalent with established companies is over the negotiation of the licence and the specific rights that are required by a university. The deals that we negotiate at Isis with third parties should not interfere significantly with the University's key mission of research and teaching nor risk damaging the University's 800 year old reputation, so we typically need to seek contractual protections for the academics and the university which can conflict with the views of investors. The same issues can cause problems for licensees as well, but typically the consequences of the success or failure of a technology licensed to a well-established company are less pronounced at an organisational level than the consequences of the success or failure of a setting up a spin out company.

The stakes are therefore often higher with spin outs, which can lead to more protracted negotiations.
We aim to be the bridge between the "external" commercial and "internal" academic worlds, a task that is by no means straightforward. However, it is important to understand that a lot of the time technology transfer managers have the difficult task of balancing and accommodating a complex set of commercial and academic priorities and concerns.

Adam Stoten: One of our challenges is trying to

reconcile some of the university specific issues that we need to accommodate on our licences, many of which relate back to obligations not only to our parent institution but also to funders, with the legitimate concerns of our potential commercial partners.

That will always be challenging, because in some cases such as publication freedom, and licences back to the university for non-commercial research use, they fundamentally jar with commercial ideals. Some of the investors understand these obligations very well and we have well-established mechanisms to achieve a fair balance. Other investors who are newer into investing in this stage and this sector find it harder to get to grips with.

B&M: There does seem to be a consensus emerging that TTO's need to change, they need to evolve and adapt. Imperial Innovations for example, describes their evolution from a technology transfer organisation to a technology development organisation and the need for an upskilling of technology transfer offices. Would you concur with that approach?

Linda Naylor: On that particular point, I agree with Imperial, we do have to develop ideas and technologies, incubate them for longer before engaging with third parties. However, in many ways to be able to do this something in government thinking has to change as well. We've managed to make our internal seed/POC funds evergreen, but to incubate projects longer there needs to be financial assistance in other areas, I don't think TTO's can manage it all on their own.

Adam Stoten: TTO's will always need to change and adapt as the environment in which we operate is so multi-faceted and complex, with many elements including the macro-economic climate, commercial appetites and interests, investment mechanisms and models, all constantly evolving and changing. Key to our ability to adapt is to employ people who are flexible, creative and motivated to find new and better ways to transfer technology. We certainly recognise that we need to have a culture of continuous improvement and to listen to the changing needs of both our parent organisation and of our external funders and partners.

B&M: To get an external perspective, do you use entrepreneurs in residence? What are the pros and cons of using them?

Linda Naylor: Not at present, although it is something that we have considered and continue to evaluate, especially in relation to potential expansion of existing incubation facilities. Based on feedback we have received from other universities that are employing EIRs, and particularly out in the US where it's quite a common theme, the jury seems to be out on the benefits. The key is to find the right calibre of individual. The major points associated with this seem to be whether the individuals receive remuneration or not and how this affects a) the calibre of the individual and b) the attitude of the individuals towards the role and also the length of contract offered to a potential entrepreneur in residence.

However, we have always aimed to recruit a CEO designate for each new spin out opportunity, who champions and works on that project to develop a business plan and raise investment. So while we don't currently use entrepreneurs in residence, we do always have an external perspective on the technology.

Adam Stoten: We are increasingly deploying expert industry panels or individuals to come in and look at groups of related projects in our portfolio such as vaccine technologies to provide an external perspective on the commercial potential of each which helps inform our decision making on how we progress those. We also convene an external expert panel for each individual spin out project to assess the opportunity early in the process.

I think that is a challenge for TTO's to work out what internal resource they need to develop vs. what external resource they need to tap into. Working out where you draw the line between developing internal resources and accessing expert specialist external advice is something that we're going to be grappling with as we expand and develop our incubation activities.

B&M: Taking a step back, how would you like to see academics approach you?

Adam Stoten: It can be difficult for TTO's if the academic simply hands something over and says off you go, can you run with this. Ideally we need academics to be engaged and supportive of our efforts to commercialise their technologies, whether it be through them applying with Isis for translational funding or engaging with industry partners; they are often best placed to sell their technologies to a potential partner. Without an on-going investment of time and effort by the academic it's very difficult for us to be able to achieve a successful result.

Right now there is a cultural shift in the right direction, but there is still some way to travel.

B&M: Is there any advice you would give to academics or start-ups that are seeking to commercialise technology?

Adam Stoten: There are a few fundamentals. Understand in relation to your given technology what industry perceives as adequate proof of concept or proof of principle. Have a plan to get there and engage with us to do so. I think managing expectations early on that this is what we need to reach a mutually beneficial result is important.

However, it is also very important to understand what the academic wants out of the process, where they want to go with it.

Linda Naylor: My advice is simple: talk to us! As early as they want, it doesn't matter how early as far as we're concerned.

Adam Stoten: In fact the ideal from my perspective is not for us to engage at the point at which an academic knocks on our door with a new invention, it's in the research phase when they can see the research they are doing has the potential to yield commercially useful results, and to engage with us at that point to start to plan for success. This interaction can be quite a light touch, but I think there's a huge advantage to both the academic and ourselves in engaging at that point.

B&M: What about pharma, industry and investors, what sort of advice would you give to them? Is it also the case they need to engage with you a lot earlier?

Adam Stoten: I think industry is doing that on an increasingly frequent basis. We're seeing tangible evidence of this, certainly with big pharma. Investors are interesting, I think there may be a move more towards a US model where investors identify an area or disease of particular interest where they think there is a commercial opportunity, identify the key investigators in that field, potentially from various different institutions, pull them together into a new company, and then use that pool of expertise to generate new IP. There may not be much IP, if any, in the company to start off with.

Many companies who wish to engage early and develop a relationship with Oxford and Isis do so by joining our open innovation network, the Oxford Innovation Society, which provides priority access to intellectual property but also a chance to make strong links with the right researchers in their field.

B&M: What's keeping you awake at night, what are the issues that really bug you?

Linda Naylor: It's the issue around proof of concept seed funding. If we are going to develop ideas for longer, incubate ideas for longer, it doesn't come from thin air - I still think government could do quite a lot more to help bridge this gap. The whole agenda in university/ government funding is around impact now. We need some help to create this impact somehow.

Adam Stoten: In terms of what keeps me awake at night it's maximising the efficiency of how we manage the huge portfolio of projects from Oxford. How can we improve how we pick winners and kill off projects which are destined to fail?

B&M: Last question, and it's about the wider industry. Are you optimistic for the health care industry in the coming years?

"What keeps me awake at night is maximising the efficiency of how we manage the huge portfolio of projects from Oxford. How can we improve how we pick winners and kill off projects which are destined to fail?"

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Adam Stoten: I would say I'm quite optimistic. I think in the UK there is still huge opportunity in terms of leveraging the NHS, improving uptake and adoption of new technologies into that body, and also making the most of the clinical information that the NHS generates. I think we're seeing some good progress on this front now. I am optimistic that the academic health science networks will have a positive impact, albeit it's very early days yet.

On the funding front things are better than they have been for a while, especially for SMEs. The government support for the TSB has been a big factor. Consistency of that government support will be critical ■

Does Edinburgh BioQuarter hold the answers to a successful commercialisation strategy?

Mike Capaldi, Director, Edinburgh BioQuarter

Mike Capaldi heads up a team whose role it is to commercialise intellectual property either coming out of the college of medicine and veterinary medicine at the University of Edinburgh or coming out of NHS Lothian. We picked his brains on the new approaches to translational research, his view on the key success factors to commercialisation and some of the most common mistakes he sees early stage companies making.

B&M: Mike, where does the Edinburgh BioQuarter fit in the technology transfer and translation picture?

Mike Capaldi: At BioQuarter we take a very proactive approach. We have a detailed understanding of the research programmes that are going on in college and we look at where these fit in with what we know industry wants. We also speak to investors a lot so we know the sorts of propositions that investors are looking for and that makes us better able to build investable propositions. We take a very active role in building our spinout companies.

Technology transfer needs to be a very dynamic process. What is absolutely key is that the people involved in the process are deeply involved in the sector with a solid understanding of what industry and investors are looking for. In the UK as a general rule technology transfer offices tend to be a bit more passive than being on the proactive side.

B&M: Can you point to any exciting models of transitional research that are emerging?

Mike Capaldi: Not so much new models but just a change in thinking. The government now recognises that using public money to fund early stage translational research is an important contributor to building a viable life science ecosystem in the UK and that they have an important role to play in helping early stage companies across the (funding) valley of death. There are now more sources of translational funding available to help get companies to the stage where they will be in a position to attract investor.

B&M: Aside from capital, what are some of the other challenges that academics, universities and start ups are facing at the moment in commercialising research?

Mike Capaldi: There is still a sense amongst some researchers that they don't particularly want to do applied research. Historically, the university system has been geared towards doing good, basic research leading to publications in quality journals which is subsequently rewarded by further grant funding to do further research. The concept of actually having to commercialise something as a result of the research didn't really enter into it. That is beginning to change now as a result of how universities are now ranked (commercialisation 'impact' is now a big part of the ranking criteria).

Another challenge, particularly in the biomedical area,

is the growing burden of regulatory requirements associated with product development, which are tougher now, certainly from where they were 20 to 30 years ago. The drug development process is becoming more onerous and more expensive due in large part to the changing regulatory environment. This, combined with the need for secrecy (which often means delaying publication) and the long development timelines can be off-putting for a lot of academics who rely on the ability to publish quickly to further their careers. That's another barrier that needs to be overcome.

B&M: So one challenge is a cultural, mind-set challenge and the other is around regulatory hurdles. What do you think are the key ideas that need to be implemented to help overcome those 2 major challenges?

Mike Capaldi: To overcome the mind-set it's about culture change. We've got a number of industrial collaborations running currently which necessitate a close and mutually beneficial partnership between academics and industrialists. The PIs are learning a huge amount about the process of drug discovery and drug development, and industry is learning how best to work in collaboration with academia - building a bridge between the 2 different organisations means that both start to speak a common language. To encourage this change in mind-set, we run evenings where we invite successful entrepreneurs, who've actually been out there and done it, to come in and tell groups of academics their stories. It's all about breaking down those barriers.

On the regulatory side of things it's just a question of making sure that you have the people in place that can advise appropriately. It's absolutely crucial that academics and spinout companies work with regulatory advisors from day 1 to make sure they are doing the right things. It doesn't necessarily mean you need to have a regulatory expert in your organisation, but you do need access to expert advice. In the long run, this will save time and money.

> "It's absolutely critical that you have a laser sharp focus on what you need to do in order to deliver the milestones that have been agreed with your investor(s)"
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B&M: What do you think are the key success factors to commercialisation?

Mike Capaldi: There needs to be a demonstrable market need. We've all met people that come to you with an idea for a new product, citing huge market potential on the back of minimal market research. The second success factor is intellectual property. Again, this is an ongoing process of education within universities. We need to make absolutely sure that the PI doesn't publish their research before the patent's be filed. But we also have to be sensitive to the academics requirement to publish in a realistic timeframe so speed is of the essence.

The third thing is to look at the competitive landscape. So, we've invented a drug or a diagnostic device, which fills a current need in the market. But who else is also working towards that goal? How well developed is their product? What potential advantages does your product have over theirs? You may not want to proceed if somebody else is already 2 years ahead of you with an equivalent product! That's a very obvious thing to state but it's amazing how many times people fail to take that into consideration.

If you haven't addressed those questions, you're never going to be able to raise any investment for a potential spinout company because that's the first question that any venture capitalist is going to ask you.

Finally, once you've formed your spin out company and

have all the right pieces in place, it's always a bit of a challenge finding the right management team. Inventors of the technology are not necessarily the best people to run the spin out company. On the other hand, it is often critical that the technology inventor stays intimately involved with the company so it's important to give due consideration to these (sometimes sensitive) issues.

B&M: Ok so we've talked about some of the key success factors. What are some of the most common mistakes that are made by companies that are spinning out or attempting to commercialise their technologies?

Mike Capaldi: One of the mistakes is almost by necessity - they cut too many corners. One of the reasons for this is because they can't raise enough money, so they try and do things on the cheap. The trouble is, this will inevitably come back to bite you at a later date.

The other mistake is that people are not particularly focused. It's absolutely critical that you have a laser sharp focus on what you need to do in order to deliver the milestones that have been agreed with your investor(s). It is tempting, particularly in the biotech area, to get side tracked by the other stuff going on around you. These days particularly, the venture capital model is tending towards asset-based investment rather than the company based investment, so it's even more important that you remain focused. Once that is successful you can start to branch out a little, but don't try and do too much up front. It just doesn't work these days.

B&M: Ok, following from that, if you had a couple of pieces of advice you would give to academics, start-ups or PI's, what do you think that advice would be?

Mike Capaldi: I do think it's important that if they've got an idea for something that they think could potentially be commercialised, get along to your technology transfer office early. Make sure you're asking all the right questions. It's your technology, and if you've got a vision of where it could go, push hard on that, but make sure you're speaking to people who have good knowledge of the sector and can give you good guidance. But be prepared to listen and go with an open mind. That's really important.

The other bit of advice I'd give is always think about your intellectual property. There's a dichotomy here. Academics careers are built upon writing quality, pier reveiwed papers, on the back of which they secure more grant money and build their research labs. Sometimes when you go down a commercial route, there may be times when you aren't able to publish, or you have to

delay publishing, and that can cause conflicts. The short term 'loses' need to be considered against the longer term 'gains' in this respect.

B&M: On the TTO's, there's a lot of concerns that have been levelled against them. Have you found that people are generally unhappy with TTO's at the moment and if so why do you think that is?

Mike Capaldi: Yes absolutely. I do hear a lot of people sounding off against TTO's. Some of it is completely fair; some of it is slightly unfair.

I do think it is a mistake to fill technology transfer organisations with people that have no commercial or industrial experience - that could lead to bad advice. It's very easy for technology transfer departments to become inwardly focussed and out of date. Good TTOs work proactively to stay in contact with the 'market', bringing industrialists, investors and academia together to seek solutions. Simply put, TTOs should endeavour to be market-led, rather than technology-led.

Here at Edinburgh BioQuarter, we employ industrialists to work with the academics. We spend as much time speaking to pharmaceutical and biotech companies as we do speaking to PIs. One of the challenges with this approach is that in general, taking people from industry is more expensive. So universities have to accept the fact that going this route is going to be more expensive for them, but at the end of the day, it's going to pay itself back many times over because they're going to do bigger deals, or spin out bigger companies.

B&M: Another criticism that perhaps you've heard about TTO's is around the supposed over valuation of IP. Do you think that's fair? There is obviously a big disconnect there in terms of how IP is handled.

Mike Capaldi: Yes, it's the same issue. If people are disconnected with the market, they tend to have an unrealistic expectation of what IP is worth. One of the challenges is that the value of IP changes depending on the way the market is thinking about it at the time. If the TTO is out of step with the current market thinking, that is where discrepancies will arise.

Another classic example is spin out company valuations. The university thinks the pre-money valuation should be £2m, which is probably unrealistically high, the venture capitalist thinks it should be £200,000, which is probably on the low side. There's a negotiation to be had there.

On a different tack, I also think that companies often try to take advantage of universities. For example, if you look at the terms upon which licensing deals are done on, biotech companies generally get much better terms than universities. Why is that?

B&M: Let's talk about pharma companies. What do you think is the optimal strategy for working with them?

Mike Capaldi: The optimal strategy is to make sure you're not wasting their time. To make sure that you're bringing potential bits of technology to them that you know they're going to be interested in.

I think risk sharing is absolutely critical. If it's a true collaboration there should be risk sharing on both sides. Industry should be taking some risk, and the academics should be taking some risk. Again that's one criticism that could be levelled at universities - they expect customers to take all the risks but they still expect to share the benefits.

However, if the university is playing a substantive part in developing the technology or the drug or whatever, it should share in the rewards. Historically, pharmaceutical companies have been extremely unwilling to share royalties with academia, but if companies see universities as being critical to filling the innovation gaps in their pipelines, they must be more prepared to share the rewards as well.

B&M: Are there any major issues of concern you have with the industry in general?

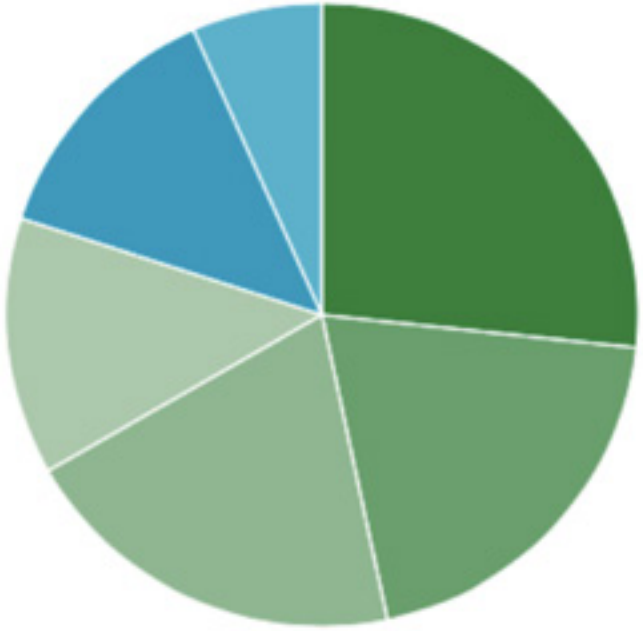
Mike Capaldi: For biotech, particularly in Europe, access to capital is a huge problem. For big pharma, the growing challenge is how to be more innovative. One way of addressing this is for industry to work more closely with academia to help fill their product pipelines. The dynamics of the sector are changing and the pharmaceutical industry needs to think much more about how it can nurture the whole sector, how they can help the biotech community whom they have come to rely upon for the last 20 years to fill much of their pipelines. How are they going to nurture that so that it doesn't dry up?

Finally, the exodus of pharmaceutical R&D from the UK concerns me. The quality of research in the UK is second to none, and yet we've seen a slow withdrawal of R&D facilities from the UK over the last few years. Cost cutting can become a downward spiral that is not always in the best long term interests of innovative research ■

JULY COMMUNITY POLL

Where do Tech Transfer offices need to improve?

What are academic entrepreneurs and recent spin-out CEOs saying about their experiences in commercialising their assets? What would they like to see improved and what are their most common frustrations?



- Setting of realistic deal terms and quicker negotiations
- Facilitating partnerships between academia and industry
- Encouraging entrepreneurship within the faculty
- Helping with product development
- Better business planning for technology/research
- Reducing transaction costs

PANELISTS INCLUDE:

Tony Hickson, Managing Director, Technology Transfer, Imperial Innovations | **Mike Capaldi,** Commercialisation Director, Edinburgh BioQuarter
Richard Seabrook, Head, Business Development, Innovations, The Wellcome Trust | **Keith Blundy,** CEO, Cancer Research Technology
Simon Portman, Managing Associate, Marks & Clerk LLP | **Allan Marchington,** Partner, Apposite Capital

Tech Transfer, Translational Funding and Start-up Capital

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Making the commercial connections between academia and industry

Dr Anne Lane, Executive Director, UCLB

Dr Anne Lane has a PhD in medicine from UCL and an Executive MBA from Molson Business School, Montreal. She is Executive Director of UCLB, acts as Director and interim CEO on several of UCLB's spinout companies and oversees the company's licensing activity. Anne is also a member of the Licensing Executives Society (LES) and is on the committee for the Intellectual Property Lawyers Organisation (TIPLO).

We spoke to Anne about the approach UCL Business is taking to service its entrepreneurs and their associated research and what she sees as the key to successful tech transfer collaborations.

B&M: Anne, you're Executive Director of UCL Business, but can you briefly summarise what your role entails and where you feel you add the most value?

Anne Lane: One of my main roles is running the two tech transfer teams that we have. It's really making sure that the relationship between the university and ourselves is as good as it can be and making sure that we pick up all of the technologies that's coming out of the university. On the external side a lot of it is networking, raising our profile and dealing with industry bodies. I've worked in both academia and industry so I think I've got a good grasp of all of the things that you might come up against from developing a technology. I think having that commercial and academic background makes a big difference to what I do.

B&M: Can you briefly outline what you feel makes UCL Business unique compared to other TTOs?

Anne Lane: I think our model is unique because we're one of the few tech transfer offices that is not only self-sufficient in covering its own operational cost, but also reinvests all the excess revenues back to the university where it's ring fenced for further UCL Business projects. That independence and self-sufficiency means we can be much more proactive and be much more commercial than possibly some of the other TTOs. But then we're lucky because we're at UCL, it's a university that offers significant deal flow. I think if you were a smaller university it would be very hard to run the same model. If you also look at how UCL have set up their enterprise initiative I think they've been unique as well. They're the only university as far as I'm aware that has a Vice Provost of Enterprise and that's meant it's much easier for us to get our message out there because he's an academic, and he's also our advocate.

B&M: What in your mind makes for a good solid tech transfer relationship?

Anne Lane: I think one where both parties respect each other's skills and where our clients realise that we have done this before and that we do know what we're talking about. In the past that's not always been the case so I think there has to be a lot of transparency and I think we have to understand what pressures our clients are under.

> We've tried to develop technologies where the researcher really hasn't been on board and isn't interested and you can imagine that makes for a very difficult process
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Helping them through that balancing act of commercial work and backing their academic careers. Sometimes clients want to go right to the commercial side and then it's a matter of navigating them through the UCL system and how you transition them from being in the labs to having their own independent set up. If they've been involved in other collaborations or contract research work before and they've worked with industry in the past obviously this makes the whole process a lot easier.

I also think the researcher needs to be the driver in one sense, that they really have to want to have a spinout and really believe in it. We've tried to develop technologies where the researcher really hasn't been on board and isn't interested and you can imagine that makes for a very difficult process.

On the other hand, if we have UCL academics that don't want to work with UCL Business we don't make them. If they want to go off on their own and develop the IP that's fine, we'll make sure the university gets a small amount back but we're not going to stop people doing that and that's made a big difference to relationships. I think some universities struggle with that approach because I think they want to try and keep everyone in line and you can't do that with academics, that's why they're academics. They are free thinkers which is exactly what we want. Really in some ways the most challenging people you work with are some of the best people to work with, you might not enjoy it at the time but usually you find that's where the big innovations come from and the most successful businesses.

That said it's also important that both sides appreciate their skill sets. What we try and do is to involve them in a scientific advisory capacity because that's where their skills are. Being on the Board and making decisions about how the company runs when you're thinking of it as your technology, would mean that the right commercial decisions aren't made.

B&M: Do you see executive placements as a key element of your TTO responsibility?

Anne Lane: To a certain extent yes. Sometimes the academics themselves know people and already have relationships in that area because they've already been talking to investors or to industry. We do quite a lot of networking and find people that way so I think that's one of our contributions. It's also about finding the right people at the right stage.

B&M: How have you seen the interactions change between yourselves and other parties over the past 12 months?

Anne Lane: From a Pharma point of view they seem to be much more aware of what our priorities are and much more open to the fact that there are certain things that we just can't do as a university representative and I think investors have also come round to that way of understanding. I think that's been the big difference in that there's much more understanding on both sides of what the pressures and priorities are. There's much more willingness to compromise in negotiations.

B&M: How do you see the wider technology transfer sector changing in the coming years?

Anne Lane: I think it's closely linked to the government, what the government influence is going to be and there's also EU legislation and regulation coming in that will impact on the IP environment. So how you use both to extend your market will be a big issue.

Closer to home there's a concern about the higher education innovation fund which historically has made it easier for TTOs. If that disappears then that's going to be a big hole, not just for us but for other people.

The other thing is the Government's Impact agenda. On one hand it's been to our advantage because when people are putting in grant applications they have to show what impact their research is going to make. But then impact isn't just for commercial benefit, there are other things that need to be considered.

B&M: What are some opportunities you see opening up for UCL Business in the coming years?

Anne Lane: For us it's about continuing to support the research coming through and ensuring they're

given the best possible start on their journey to commercialisation. Its also about working smarter and more collaboratively with investors and pharma at earlier stages to ensure that all parties are benefiting equally from the collaboration. I see Pharma looking earlier into bioscience as a great opportunity for UCL to gain support, both financial and knowledge based, but tied to that needs to be an understanding of all parties wishes. So I see opportunity in how we re-evaluate and repurpose our relationship with Pharma and Investors.

B&M: How does the UK life science sector continue to "capitalise" on its current buoyant status?

Anne Lane: I think it's encouraging the developing skills within the UK for the sorts of researchers that you want who are going to be the basis of success for biotech companies. I think in terms of the patent cliff, that's obviously going to be an ongoing problem so you need to have continued innovation. I think this particular Government and the one before it was very keen on life sciences and ring fenced a lot of funding for life sciences and I think that did make a big difference. They've got to try and capitalise on particular areas of research like stem cells, tissue engineering, personalised medicine and synthetic biology.

I think the fact that the public markets have opened up again is great because we've got to get an exit from somewhere. Trying to do it through acquisitions or company sales is always going to lose technologies because the focus of the acquirer is not always going to be the same as the acquired. So for me, if we can engage on greater levels with generalist investors and help them to see the potential in UK bioscience then it offers up our companies with a greater choice of exit.

B&M: How do you see TTO's playing a role in the continued growth of UK bioscience?

Anne Lane: Speaking from the UCL set up, we've got a very strong Translation and Research Office embedded in the university which makes our job much easier and helps us broaden our focus. I think if there was more of that type of interaction within universities then that would help generate greater efficiency at grass roots science. That dynamic creates a very promising set up and obviously serves as a starting point for the creation of the next generation of companies.

Aside from that, in general I do think tech transfer offices have really improved in how efficient they are at identifying the science and how easy it is for industry to deal with them, communicate and make sure things happen.

As more and more pharma and investors look to earlier stage investments, our role will obviously become more important, as will the interactions themselves. I think industry needs to access this research and is now actually lagging behind. I think that although there's still room for improvement on our side that's also true of industry.

B&M: What piece of advice would you share with an academic looking to approach UCL Business?

Anne Lane: First of all, there needs to be a mutual respect and appreciation for each other's skills. Realise we are on their side, and we are trying to protect their interests. The second is don't be surprised if how the journey started isn't how it ends up. There is a real need to be flexible at all times and appreciative that its isen't always a straight and true journey ■

Commercialising cancer research: CRT's powerful development model

Prof. Keith Bundy, CEO, Cancer Research Technology

Cancer Research Technology (CRT) is Cancer Research UK's development and commercialisation company. Dr Keith Blundy, CRT's CEO, tells us exactly why CRT's development through partnership model is so powerful and explains why immune-oncology is so exciting.

B&M: Keith, can you give us your elevator pitch: what is CRT and what makes it unique?

Keith Bundy: Cancer Research Technology develops and commercialises exciting new discoveries in cancer research, for the benefit of cancer patients but there are three characteristics that make CRT unique.

Firstly, we're entirely focused on cancer. Secondly, we have access to a huge pipeline of research here in the UK (Cancer Research UK funds 350 million pounds of cancer research per year, making it the largest charitable funder of cancer research in the world) -and all of that flows through CRT. Thirdly, we have access to development and translational infrastructure that enables us to remove some of the early risk before working in partnership with industry.

In combination, these elements comprising our network, development capability and cancer focus make CRT truly unique.

B&M: What do you think are the real keys to successful commercialisation? What makes it work?

Keith Bundy: I think successful commercialisation means identifying the right people (partner), who can add the right part of the value chain – that either you do not have or could not build – at the right time. Then it's about doing the deal speedily and in a fair and transparent way. Having flexibility or different commercialisation routes is also important in a changing world.

I think there is also a big element of developing your BD team to get deals done. That's about the culture you set. Our team is set the objective of doing a fair deal at speed and to not lose a good partner through over negotiation.

B&M: What do you think are the top 1 or 2 challenges that you're facing?

Keith Bundy: Right now there's still not enough early stage funding available. We have seen a really good turn around for some of the venture money available for the early stages, which has been very welcome. But we still need money to take the initial idea to proof of concept or to progress to the next small step where you might be able to market the idea to venture or other partners.

Another challenging area for us is the diagnostics space. I see that as more complicated because the way

> Our primary aim is not value inflection or selling something at the highest price (only a fair price), it's about trying to make sure as many technologies as possible are 'advancing discoveries to beat cancer

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you have to eventually deliver a product is much more fragmented. Customers use a multitude of different platforms, so the development route it is not so clear.

B&M: Now much has been made about the dominance of immune-oncology, what is your view of immuno-oncology and why do you think it's such a hot area?

Keith Bundy: The bottom line is patient impact. It's shifted the whole survival curve and demonstrated sustainable survival benefits. It's working, and it's working in a durable way. You've seen patients on CTLA4 and now PD1 antibodies with 5 year/10 year survivals. We haven't had changes in cancer survival curves like this for many years (if ever).

It also doesn't look like you're going to get the same resistance problems as with molecules that are targeted to one specific mutation. The immune system keeps evolving with the tumour once it's "woken up" to recognise the tumour, so whatever the tumour does it deals with it. And that's the fundamental difference. It's a game changer, there are many further opportunities to be explored, and that's why everyone is so excited.

B&M: You have over 200 projects in your portfolio available for licensing and co-development. What is CRT's approach to licensing and what do you think makes for successful outcomes?

Keith Bundy: Our approach has always been to do the minimum we need to do to get a project into the hands of an appropriate development partner. That way we can then turn our resources to pursuing the next opportunity. The more technologies we get out and into development, the better. Our primary aim is not value inflection or selling something at the highest price (only a fair price), it's about trying to make sure as many technologies as possible are 'advancing discoveries to beat cancer'.

We'll only invest in further development in house when the science is more unproven and requires bigger data packs to attract people. We're also looking for the best development partner we can find, making sure a fair deal is done, and that we've got requisite development plans and diligence in place. In summary, our approach is to licence as many technologies as we can, as fast as we can, and with the best partners we can. We also ensure we keep good relationships with companies so that, should anything change, we've got the rights to get the project back and progress it elsewhere.

B&M: CRT has partnerships with the likes of AstraZeneca, FORMA and Teva. What are the objectives of these partnerships and are there any unique characteristics with the partnerships you've developed?

Keith Bundy: There are two key types of partnerships we develop at CRT. Firstly, there are partnerships where we negotiate and act for an academic group that wants to partner with industry. This is pure business development, and we do lots of transactions like that.

Secondly, there are partnerships where we're combining a company directly with CRT-employed scientists. And those are structured slightly differently. These alliance partnerships work very well because

they fit in with our strategy of taking an area of biology where there are multiple drug discovery targets and aligning that with an industrial partner that brings muscle. We bring some of our own discovery resources along with leading experts (key opinion leaders, PI's) as scientific or biological advisors into the programme. And we think that's a very powerful mix for doing drug discovery - it's very appealing to industry right now.

B&M: Why do you think it's so appealing to industry?

Keith Bundy: The hypothesis right now is that industry has realised the old paradigm of drug discovery hasn't worked. It's gone through a phase of acquiring more and more technologies to turn the handle, industrialise it, and the view was as long as we do more, drugs will pop out the other end. Industry has found out that this approach doesn't work, since the biological hypothesis or biological understanding from the outset was either too weak or not well validated. The new paradigm is a relentless focus on really understanding the biology. Who has access to the biology and biologist's Funders like Cancer Research UK, or MRC.

CRT's ability to bring the best researchers in any one area into a programme and then as the science develops bring in others, makes us an attractive partner. Companies can do one deal with us and they have access to that incredible network. It's a powerful new model and absolutely it will pay off.

B&M: One of the trends we're witnessing is that industry is moving a lot closer to the provision of earlier stage research. How do you see these trends in translation and commercialisation evolving and changing?

Keith Bundy: I think the trend is for industry to move earlier but more importantly, in more and more creative ways. Companies are changing the way they're funding their R&D. They're cutting down the amount they do in-house and have more available to work in different models i.e. in risk-shared, co-funded models with other people, including funders like us. So I think we're going to see a plethora of different models, in the way the work is funded, whose employees are doing it and where they're doing it.

B&M: Another trend, or more of a buzzword, is open innovation. What are your thoughts on this?

Keith Bundy: This is an area that I think is still unexplored and there is still a way to go. I don't know

what 'open innovation' really means, I don't think anyone does, it seems to mean different things to different people. But if you could get industry to think about what actually is pre-competitive, so that everyone doesn't repeat the same efforts and do the same projects, that would be terrific.

I think that's the next challenge, to get people to work together pre-competitively. We're beginning to see it, but until there is a common agreement about what is really pre-competitive, it's going to be hard to really maximise the value here.

B&M: If you look at the wider health care industry, are there any issues that particularly concern you at the moment?

Keith Bundy: The whole reimbursement issue. The prices at which some companies are wishing to sell their products is too great for the health system to sustain, particularly when we will need combination therapies to be effective. That plays back all the way down the value chain. It's always a concern that things may get developed here and then not be sold here and benefit patients here (in the UK).

There is also a need for better early-access schemes. One of the problems with many cancer therapies is that they're tested on patients that have already been through every other therapy available. It's then of course very difficult to show therapeutic benefits once the individual is already so compromised. So having schemes whereby you can get new medicines to patients earlier is very important.

B&M: Last question, are there any pieces of advice you would give to early stage researchers and scientists about commercialising their technology and indeed working with CRT to do so?

Keith Bundy: Quite simply, talk to us. That ongoing dialogue is so important, because you never know what we might see in a project or where a conversation might spark a lead. And secondly don't be put off by the fear of the unknown or what you don't know how to do. It's our job to help researchers and bring in the necessary resources, capabilities and knowledge to make commercialisation easy and simple for them ■

Feature: Translational Funding: A Wellcome Perspective

Richard Seabrook, Head, Business Development, Innovations The Wellcome Trust

The Wellcome Trust is a global charitable foundation with a stated aim of achieving extraordinary improvements in human and animal health. It is at the coalface of early stage biomedical research and its influence in the future of bioscience is pivotal. We caught up with their head of translational funding, Richard Seabrook, to discuss translational funding trends, success factors and pitfalls; the drug resistance problem and the state of UK Lifescience plc.

B&M: Richard, you're head of business development for the innovations division of the Wellcome Trust. Can you explain a little bit about what that role entails and where you add the greatest value?

Richard Seabrook: The role involves managing the Wellcome Trust's translational funding. We will fund specialist academic groups, SME's or even larger companies for public health reasons and when we can be convinced that we're not subsidising their shareholders.

The value that we bring is that we're able to develop products which otherwise would not get started because of the risk, economic cost or the difficulty of raising funds in the investment world. By way of evidencing that, we have a number of products that are on the market (no drugs or vaccines) and have had a number of exits with SME's and a few IPO's on the AIM market. Which are all indicators that we are adding value to the eco-system.

B&M: And what is it about the collection of services or offerings that you find unique or stand out for the Wellcome Trust?

Richard Seabrook: We are fortunate, what we can really bring is scientific and biomedical due diligence. Through the Trust's network we're able to bring due diligence which is genuinely international, and we're able to get key opinion leaders not just from the scientific community but also from the clinical, financial and the regulatory communities. We can really get to understand a project before we fund it. It's the advantage that we can bring.

In addition, we have no geographical limitation as to where we fund, which gives us an advantage over regional funders because we are able to compare projects from around the world before we decide which ones to fund.

B&M: What makes for a great project?

Richard Seabrook: Clearly a good project addresses an important unmet medical need. We're not into 'Me Too's' or making incremental differences. It's helpful if the project is based on really good science, although we will fund projects in which the science is less profound if it is addressing an important public health need. And obviously we're looking at funding teams of people who have all the right competences and attitude to deliver on the project.

B&M: I guess the core outcome for you in these projects is to make them ready for follow on funding? How do you manage the relationships with other investors and pharma and the business community?

Richard Seabrook: As a gap funder, a key question we consider is how far do you have to fund a project to deliver the data package that is going to be attractive to the follow on investor? Whether the follow-on is the financial community or an existing company. Obviously that's a bit of a judgement call, and actually the data package that you have to produce sometimes changes during the lifetime of the project as things change in the eco-system.

We keep close contact with projects that we fund so we can feed into what that data package has to look like. We discuss it with potential partners and we'll feed that information in to the project management team so we agree what package of data we have to aim at.

We're fortunate at the Wellcome Trust because we have an investment division and through them good contact with the financial community both in Europe and the USA. We do work with a lot of large pharmaceutical and medtech companies indeed a lot of their people are already giving us advice on our projects. So we are able to contact those companies and find out what it is they are interested in and again what sort of data it will take to get their interest.

B&M: What are some of the pitfalls? Why might projects not follow on?

Richard Seabrook: Things don't follow on for a variety of reasons. One is that there are enough alternative approaches, so you're competing with other approaches and you're maybe a little further behind or there's some aspect of the programme that isn't seen as competitive as another programme.

> Fundamentally if you've got the right data package you will find an investor/partner, it just might take longer if it's unfashionable.
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Sometimes you can be approaching large companies at the wrong point in time in terms of their own cycle and what they're looking at. Sometimes there are fashions as well that you have to try and surf in order to find and attract a big funder. For example, immunotherapies are not new but are very popular with large pharma at the moment.

Fundamentally if you've got the right data package you will find an investor/partner, it just might take longer if it's unfashionable.

B&M: How have you seen the translational funding landscape changing in the last few years?

Richard Seabrook: Definitely the move to single asset vehicles. Mean and lean, it is a model that we've had a lot of experience with for a number of years now. We think it is a very good way to go. The difficulty of course, from the company perspective, is it may be difficult to recruit people because if 1 asset fails there is no backup. So recruitment for companies can be difficult in places.

The other trend which we've spotted is the appetite for pharmaceutical companies to partner a lot earlier. Historically the sweet spot for partnering with a pharmaceutical company is when you have human proof of concept data. This is still the main magnetism between an out licencing group and a pharmaceutical company. Encouragingly though, there is evidence of a lot of interest in partnering at a much earlier stage. Indeed pharmaceutical companies are setting up incubators and innovation centres in hotspots around the world. That is all points to them trying to get to work with academics or SMEs at an earlier stage.

B&M: How do you see this trend affecting what the Wellcome Trust does? Do you see it as an opportunity or as a potential limitation?

Richard Seabrook: The eco-system is getting more and more complex. The differences between major pharma, biotech and academia are all getting fuzzier. And there are complex hybrid models emerging as well such as the open innovation centre Stevenage Bioscience Catalyst. It's just a more complex system. But I think over all we don't see the changes as a threat, it's an

opportunity. There are a variety of ways we can now work with organisations.

B&M: Are there any particular opportunities that you would be hoping to expand upon in the next 12 months?

Richard Seabrook: We're particularly interested in the anti-microbial or drug resistance problem. We want to understand how we can have a bigger impact in that area, so that's a bit of active research which we're undertaking right now which will influence our strategy going forward.

B&M: What do you think are the principle obstacles to achieving success in tackling drug resistance?

Richard Seabrook: There are scientific challenges. It's proving difficult to discover new classes of anti-microbial agents, particularly for bacteria. The target-based approach to drug discovery has been monumentally unsuccessful in this arena. People have gone back to doing phenotypic screens which are expected to be much more fruitful.

The part which is over shadowing all of it of course is the economic incentive component. The difficulty there is if you do get a new approved antimicrobial then it's going to be on the reserve list, it isn't going to be used immediately, this is stewardship to reduce the likelihood that resistance will occur. Therefore there's a disconnect between the market pull and the public health needs. The public need new antibiotics but once they're available they need to be kept on the shelf until needed, and that means low sale volume for the marketing organisation.

B&M: How do you think that can be addressed? Who can solve it?

Richard Seabrook: The Wellcome Trust are hosting a review sponsored by the Treasury and Department of Health in the UK to look at financial incentives for anti-microbial drug resistance, because it is a huge problem. The Office of Health Economics are also doing some work in this area, and there is a lot of work in the USA, e.g. the Infections Disease Society of America and IDSA and the Pew.

B&M: Are you optimistic that you're going to be able to solve the problem? Are we doing enough at the moment to help address it?

Richard Seabrook: The problem has to be solved, otherwise medicine is going to lose one of its greatest beneficiaries for mankind, so I think eventually we will solve it. However, right now, globally we're not doing enough. Pharmaceutical companies over the last 5 years have by and large left anti-infection research because of the economic problem, and we need to turn that around. Bear in mind 30% of people in a European hospital are on antibiotics. And there are some diseases now, in certain parts of the world, where 70% of cases

have got multi-drug resistant bacteria. That's pretty scary.

B&M: Beyond the anti-microbial challenge, what else from a Wellcome Trust point of view do you see areas of challenge in the short and medium term?

Richard Seabrook: There's definitely an issue around major chronic diseases. Until recently we would have considered obesity, type II diabetes and Alzheimer's as being very attractive to industry because of the very large markets, but there's been a number of late stage phase III failures in those 3 major chronic disease areas and the pharmaceutical companies are now very, very conservative in these areas. We are thinking about what our strategy should be in our response to that. These are very serious threats to public health. Of course lifestyle can make a big difference. But that involves influencing human behaviour which is a very difficult thing to change.

The two challenges, the loss of anti-microbials and chronic diseases, if they continue the trajectory they are on, they're going to bankrupt the healthcare systems.

B&M: What do you think the Wellcome Trust can do to halt that?

Richard Seabrook: I think one of the first things we can do is increase the visibility of it so the public and policy makers understand the problem. Secondly we need to think about how our research and translational funding can offer up solutions to these problems. And that includes how do we influence human behaviour. How do we use our understanding of the brain to enable people to make much healthier lifestyle choices?

B&M: On a more positive note, the UK life science sector as a whole is experiencing an upsurge, which is good to see. What in your view is contributing to that of late?

Richard Seabrook: I think it's the result of a lot of hard work by a lot of people, say over the last 5, maybe 10 years. The difficulty is of course that these things may be cyclical. Let's hope the sector remains buoyant.

We need to not get too carried away and just continue focusing and developing the assets, if the sector creates good products then the money will follow.

B&M: What do you think are the threats to UK lifescience plc?

Richard Seabrook: I think the biggest threat to the UK is a lack of critical mass of companies who want to build products and be around for a long time. Those types of companies provide the training, employee know-how and skills that you need in this sector, if the knowledge disappears the sector will disappear. It's not a threat right now, but 10/15/20 years' time, we just may not have enough people with the know how.

I think it's important the amount of government funding going into the sector through TSB, MRC and the NIHR is maintained. It's all providing fuel at the early stage. We also need to make sure the UK is attractive for clinical studies. At one point in time we were the best place to come and do clinical work and I'm not sure that is still the case. We need to get back to where we were.

B&M: What are you thoughts about the infamous 'valley of death' of funding?

"The two challenges, the loss of anti-microbials and chronic diseases, if they continue the trajectory they are on, they're going to bankrupt the healthcare systems."

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Richard Seabrook: I think it is less deadly in the discovery area. In the early stage, there's definitely more funding available. The difficulty is going from discovery to human proof of concept, which is 10 or 12 million pounds - that still remains very difficult.

B&M: One last question to wrap up on. If you were to give one piece of salient advice to an entrepreneur looking for translational funding, what one thing would you impart to them to increase their chances of success.

Richard Seabrook: I would say you really need to understand the target product profile. You really need to understand how your end user is going to use your product. Everything you do at an earlier stage has got to be aligned with this product profile ■

IP: From Intellectual Property to Investable Portfolio

Marks&Clerk
Intellectual Property Services

Simon Portman, Managing Associate, Marks & Clerk

Simon Portman specialises as a commercial contract lawyer for technology companies. He works primarily for the bioscience sector but also advises clients in the defence, software and nanotech industries as well as individuals, public bodies and charities. He advises on a wide range of contracts, including licenses, R&D collaborations, manufacturing agreements and procurement documentation. On the regulatory front he has advised on compliance with clinical trials legislation and novel food applications, as well as freedom of information and data protection issues.

Simon talked to us about the ever evolving world of IP and shares his views on the current trends emerging from early stage science and how he and his clients are positioning themselves for success.

B&M: Simon, you're Managing Associate at Marks & Clerk LLP, but can you briefly summarise what your role entails and where you feel you add the most value?

Simon Portman: I head up the Cambridge office of Marks & Clerk Solicitors. I also head the firm's Commercial Team, advising clients on non-contentious intellectual property and commercial contract issues. I've worked in Cambridge, Europe's leading biotech cluster, since the nineties and clients have ranged from small start-ups to leading universities and big multinationals, based locally, nationally and internationally, engaged in drug development, medical devices, clinical trials and bioinformatics. I therefore like to think I have a good grasp of the sector, its strengths and needs.

B&M: Can you briefly outline Marks & Clerks current service offerings and explain in a little detail how you see your core IP services adding significant value to your clients?

Simon Portman: The Marks & Clerk group comprises patent and trade mark attorneys, lawyers (both contentious and non-contentious) and IP valuation experts. Clients can therefore find all their IP needs met under one roof, both literally and metaphorically. Our fee earners also have a real empathy for their clients' business needs and an in depth grasp of their technology. We don't just supply a "one size fits all" approach. Finally, we have offices in the UK's leading technology clusters and, further afield, a global presence, particularly in emerging markets like Asia.

B&M: How have you seen the demands of your clients change in the last 12 months? Are there particular trends you've seen in what clients are asking of you?

Simon Portman: We've seen real interest in how clients might be able to structure and exploit their patent portfolios to take advantage of the new Patent Box regime. There has also been a lot of interest,

> To smooth the path during negotiations, identify your champion within the other side's organisation
>
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particularly from the US, in the Unitary Patent. On the commercial front, both companies and universities have sought to take advantage of grant funding for R&D collaborations and IP audits. Lastly, VCs are still being somewhat cautious but business angels are turning out to be a useful source of funding so we've been helping putting companies in touch with them where possible. It helps that this is a very networked sector – almost incestuously so!

B&M: How has Marks & Clerk responded to these changing demands / trends?

Simon Portman: Obviously, we have to get up to speed with and often anticipate legal and regulatory developments so that we can help our clients prepare for and take advantage of them. Just as importantly, however, with many businesses still suffering from the after effects of a long global recession, we need to help clients make the most of their IP assets in a strategic, well thought out fashion.

B&M: How do you see IP continuing to evolve in the UK landscape? Do you see this differing to what's going on in Europe and the US?

Simon Portman: Currently there's a lot of concern about the US regime's stance on the patentability of natural products. Recent Supreme Court rulings in this area have left the industry very vulnerable as the US has in effect just done a u-turn on the viability of patents in genetics and the ramifications will be felt way beyond US borders. Unsurprisingly, there is going to be a lot of push back from companies in this field – and from their advisors. It'll be interesting to see what happens.

B&M: What are the key steps universities or biotechs need to be mindful of when preparing their IP portfolios?

Simon Portman: Do proper IP landscaping. Do you have the freedom to operate in that field? What licences might you need from third parties? Also, don't waste money filing willy-nilly. Restrict your applications to those territories where there will be a market or where you will be manufacturing. At the same time, don't be too narrow in your outlook but look ahead; think of the territories and markets you might one day move into and not just of today's. Finally, from day one run a tight ship and, in the case of start-ups, act from inception as if you want to sell the business. It will make the due diligence process that much painful when you go through a round of investment or a company sale.

B&M: What are the key factors in your mind that make for successful IP discussions, collaborations and negotiations? How important is the need for an appreciation of the IP asset?

Simon Portman: Do your homework not just on the technology but also on the other side's team. If you get a bad feeling from any pre-contract negotiations and it doesn't go away, the chances are that, if you sign on the dotted line, the project won't go well either. So don't be afraid to pull out if you have persistent misgivings. To smooth the path during negotiations, identify your champion within the other side's organization and cultivate him/her but, at the same time, have a substitute lined up in case of a change of staff.

B&M: What are the most common oversights or incorrect assumptions you encounter when dealing with clients around IP?

Simon Portman: "There's no point in applying for patents. We could never afford to sue infringers anyway." Not true. Most companies will at least think twice about infringing someone else's rights. In any case, a small company's aim will often be to license out

to a big one that can take on the patent costs. "Patents are all that matter." Again, not true. Even in a "patentist" sector like biotech, much of a company's value may reside in other IP like branding or know how or in being ahead of the competition.

B&M: What still needs to be done to ensure UK universities and biotechs make full use of the IP of their assets?

Simon Portman: These days they are mostly pretty clued up on the importance of IP but lack of funding is still a real problem. In the case of universities it would be nice if alumni started leaving money to their university's technology transfer office instead of a new building or the wine cellar! That's why universities are getting into knowledge transfer – to get money now rather than just sitting there and hoping that the patent royalties will come in at some time in then future. Biotech companies also face a funding challenge because it's a high risk sector and venture capitalists all too often display limited evidence of being adventurous or having capital. The fact remains, though, that these universities and companies are developing products and processes intended to treat diseases and improve quality of life so they have to be helped to succeed.

B&M: What is the single biggest opportunity for Marks & Clerk at the moment? How will you realise this opportunity?

Simon Portman: Taking advantage of the emerging markets which are now no longer just sources of IP or manufacturing expertise but also of funding and custom. With our plethora of overseas offices and foreign associates in Asia and South America we are

well placed to take advantage of these opportunities.

B&M: Conversely, what do you see as the biggest hurdle or challenge to realising that opportunity? How could you see the Marks & Clerk addressing those challenges?

Simon Portman: Needless to say, the above opportunity has occurred to our competitors too but I like to think that, with our breath of reach and depth of expertise, we are one step ahead.

B&M: What is the one golden piece of advice you would offer to a university or biotech in relation to executing an IP strategy?

Simon Portman: Despite the strong temptation, don't cut corners at the beginning just to save funds, time and effort. Doing things properly and enlisting lawyers, patent attorneys and other industry experts to help you all cost money (so by all means get an indication of costs and be judicious) but, if used properly, these advisors will save you money in the long run. Getting it right at the outset is cheaper than hauling these people in to sort out a mess further down the line when it may be too late ■

Marks&Clerk

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To find out how we can help you to protect your best interests, please contact:

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IP – Underpinning Technology Transfer and Start-up Capital

Dr Jackie Maguire, Chief Executive, Coller IP

Dr Jackie Maguire, Chief Executive of Coller IP, has over 25 years technology transfer, commercialisation and consultancy experience. She is a globally recognised IP Strategist and a founder of the International IP Strategists Association, INTIPSA.

In 2009 she was listed by Intellectual Asset Management magazine as one of the top 300 IP strategists worldwide - and in the top ten in the UK, and has been confirmed in this position every year since.

Introduction

The biopharmaceutical sector, like many others, has changed dramatically in recent years. New players have entered the market and the trend is now towards a distributed open business model where innovation is encouraged from outside. At the same time, skilled IP experts have left the major global organisations for new ventures. Some have set up small IP trading/ brokering companies which has facilitated a network for the commercialization of underutilized IP.

The main issue facing most companies in the sector is the need to find ways of bolstering profit margins in the light of the many pressures the industry faces, not least of which, for pharmaceutical companies, is the so-called 'patent cliff.' At the same time as IP teams are being downsized, pharma companies are looking to maximise every bit of value from their IP portfolios including using IP to help protect market share, to monetise it, through licensing and royalties, or by selling the IP portfolio to others to exploit.

Technology Transfer – The Rationale

Organisations are responding in various ways to these business pressures, including outsourcing and offshoring as well as by transferring technology, which can benefit biopharmaceutical companies in several ways as long as the IP aspects are correctly managed. As a result of the huge increase in costs of R&D, they may buy in technology from another pharma company, a hospital, university or perhaps a small biotech company. This may in part, be being driven by a lack of interest from public investment. This lessening of interest is one reason for new collaborative initiatives, such as the $200 million fund created by GlaxoSmithKline(GSK) and Johnson & Johnson with IndexVentures to invest in early-stage biotech companies or the formation of TransCelerate BioPharma by a number of biopharmaceutical companies to accelerate the development of new medicines.

There are some who claim that the current industry business model, despite recent changes, is economically unsustainable and that it is unable to act fast enough to put in place the innovative solutions and treatments demanded by international markets today.

Improvements in R&D productivity, and cost reduction

are key, as is a focused drive to profit from emerging economies. Few organisations can meet these challenges alone, partly because of the enormous costs and because the risks involved are huge, given the fact that many potential products fail clinical trials.

Collaboration, Technology Transfer and Intellectual Property

Hand in hand with the increasing trend towards collaboration goes the need to identify partners carefully, either to work alongside or to transfer technology and assets to. Which organisations have the right technology to fit in with the future goals of another? When it comes to disposing of intangible assets, for universities or biotech companies the issue may be what might be saleable and to whom and the need to understand the steps they need to take to prepare their IP portfolios before they approach another organisation with a view to a technology transfer deal.

Many disciplines are usually involved in these deals, but underpinning all of it is the need for an appreciation of the IP assets. All the players involved need to understand the current and future potential value of their IP portfolios. It may also be worth discussing disposing of parts of the IP portfolio – either by selling or leasing - that no longer fit the business in order to focus on those that do. Those wanting to transfer technology also need to know how to fully protect and commercialize the IP in order to make it attractive and relevant to other organizations that may be interested in a technology transfer arrangement.

A first step is for the IP holder to conduct a thorough portfolio analysis to identify the opportunities, and this is often done by using an independent expert to review the patents.

> All players involved need to understand the current and future potential value of their IP portfolios
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IP landscaping techniques that use recognised databases and registers can construct a map of the intellectual property landscape of an organization's core technology, secondary technologies, processes and know-how. As part of the process, competitor activity is identified that may influence the direction to take and a strategy can be developed. This may involve asserting and/or protecting an organisation's assets and/or developing defence strategies. Considerations might be given to strengthening the existing IP, partnership or licensing options, as well as identifying the value of the intangible assets. A key outcome of the process is a decision on whether, and how, to assert and protect the underlying assets, or whether it might be better to sell or licence them to others.

Also during the process, a number of issues will be examined, These include the future commercialisation strategy; how clear the understanding is of the company's competitive position and how robust it is; whether there is value residing in an underutilised IP portfolio that could be liquidated in order to raise cash; the strength of the IP of a company that another organisation may be contemplating investing in; the best research areas to focus future investment on in order to maximise opportunities for commercial exploitation; areas where there may be the best opportunities for commercial exploitation; what licensing opportunities might exist for the patent portfolio; and which organisations it might be appropriate to collaborate with that may have closely aligned or complementary IP.

Naturally the results of the examination will be different for every company, but the approach to each is always underpinned by proven tools and methodologies. It is critical to understand the context and challenges of the work and to carry out IP market

research to allow the production of relevant results.

An example of a company which benefited from IP landscaping is The National Physical Laboratory (NPL), one of the UK's leading public sector research establishments. NPL has a programme to develop its research and Intellectual Property (IP) . NPL had identified many different activities that might offer commercialisation opportunities, each of which was at a different point in the exploitation process. For some developments, including those for life science applications, there was a need to develop a better understanding of the associated IP landscape, both to inform the direction of the research and to develop a clearer understanding of NPL's competitive position. Coller IP undertook an IP landscape analysis on behalf of NPL in order to understand better the position of its novel diagnostic imaging technology relative to existing or potential competitors, while at the same time identifying possible opportunities for IP protection, collaborative development and licensing, and further development of ideas or technologies.

As a result, NPL obtained a more informed insight both into the opportunities for further development and commercialisation of its intangible assets and also the organisations that are active in the field and were previously unknown to them and was able to plan its strategy for the technology that formed the basis of this analysis and potential business relationships it wanted to develop.

Protecting and Commercialising IP

Although many organisations see collaboration, including transferring technology, as a way forward,

it is not without its risks, including the question of ownership of IP arising, as well as risks to the IP through contracts that just aren't secure enough, as well as the possibility of intentional and deliberate IP theft. Contracts need to be watertight, and the drawing up of one that concerns IP arrangements needs to be managed carefully.

IP and Finance

Another aspect of IP that can be useful to those involved in a technology transfer deal, or a spin-out or start-up, for example, is using IP to raise finance. Together with the acceptance that there are valid and objective evaluation methods that can be properly applied to determine the value of intellectual property, has come the increasing acceptance of IP as a tradeable asset.

Unfortunately banks are still sometimes reluctant to lend against IP, even if there is a credible understanding of how the IP is likely to translate into future profits. Lending partly – or even wholly – using IP assets as collateral is a relatively recent phenomenon. In order to use IP assets as collateral to obtain finance, organisations need to be able to prove they have a cash value which is lasting, and have a realisable market value. All this depends on a properly established valuation.

An option for raising finance, especially for firms with limited resources, is to sell IP rights to a company pension trust fund and buy them back under a long-term leasing arrangement This also ensures that even if the business runs into hard times, the IP remains secure within the pension trust fund.
Even where IP is not being used specifically to raise finance, an understanding of the monetary value of the intangible assets – which of course includes so-called 'know-how' as well as branding, skills, policies and processes- needs to underpin any merger, acquisition or investment scenario.

With the vast proportion of the value of most organisations now residing in intangible assets, the value created by intangible assets is a serious issue to consider. If done correctly and with attention to the many issues involved, using technology transfer and IP strategically can help organisations face the pressures of change, by creating a business model appropriate for the remainder of this decade and beyond ■

Feature: Collaboration innovation: Can J&J's bold approach pave the way for the industry?

Patrick Verheyen, Head, Johnson & Johnson Innovation Centre

Patrick Verheyen heads up the Johnson & Johnson Innovation Centre in London and is on a mission to forge collaborations that will lead to the translation of great science. Focussing on science led fundamental improvements, the global innovation centres have already completed over 60 deals, despite only being in existence for little over a year.

Patrick talks to us about the key success factors necessary to translate science and deliver on J&J Innovation's objectives, the scale of the challenges and opportunities he faces, what he feels are the ingredients to successful collaborations and what he sees is the future of pharma in early stage science.

B&M: What are the core objectives for the London Innovation Centre?

Patrick Verheyen: One of the core objectives of our innovation centre is to create a window on the science throughout Europe in areas of interest to J&J, ranging from pharmaceuticals, devices, diagnostics, and consumer products. So that's kind of task number one.

A second core objective is in establishing collaborations with a view to getting novel transformative products to patients and consumers. We collaborate with partners in academia, clinical centres, venture capital, or in biotech companies.

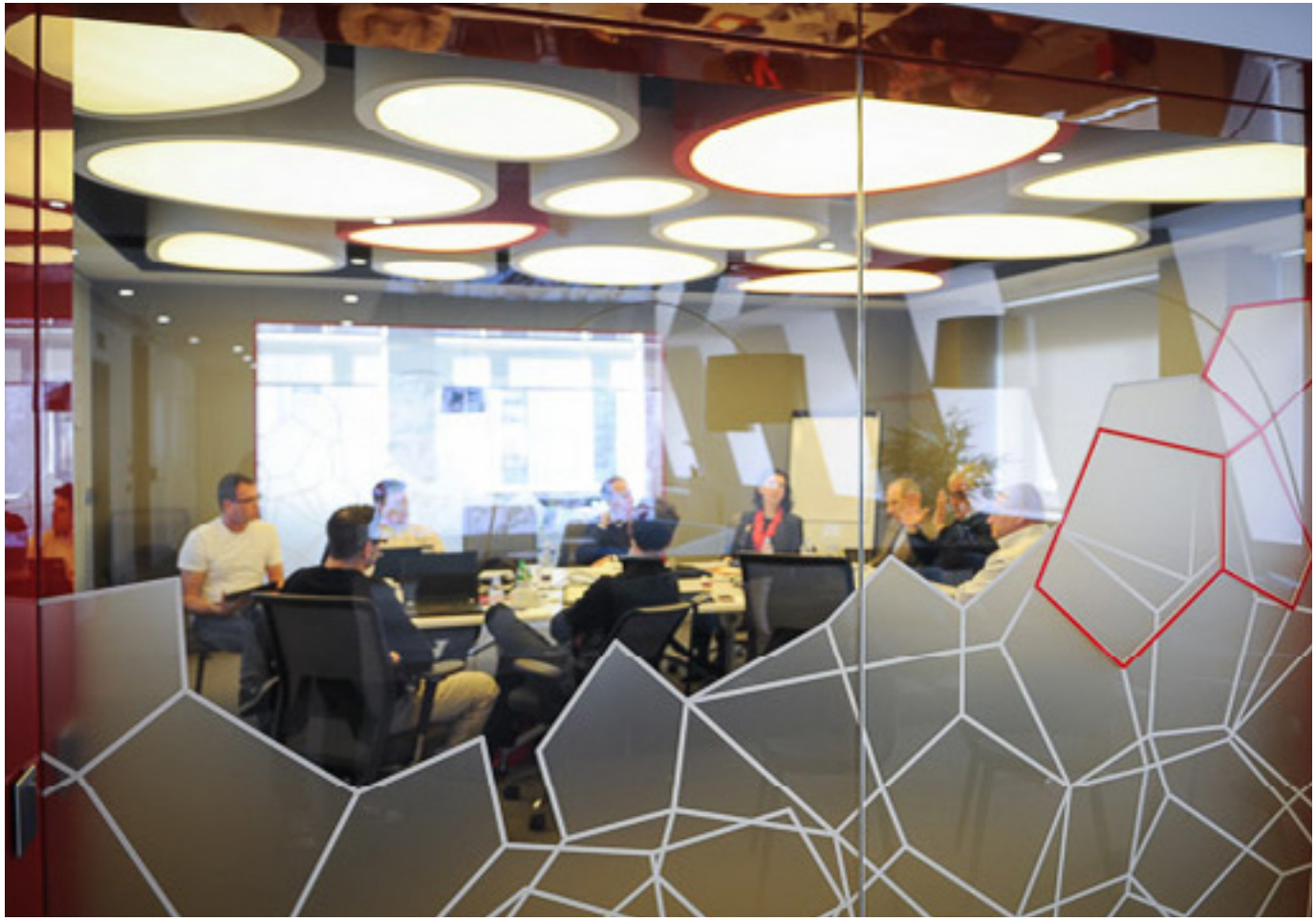
A third objective is simply to be active and engaged partners in the life science community to encourage and support a diverse environment for the translation of great science.

To sum it up, it's knowing what is out there, knowing where the science is leading us, entering into partnerships to really advance that science and working together with the community to lift everything to a higher level in terms of efficiency, and product differentiation. And I think we can do that by putting the right experts together and intensifying our networks across the industry.

B&M: What do you think that J&J gains from the innovation centres exactly?

Patrick Verheyen: We are one of the largest healthcare companies in the world, and for us it's all about delivering value to patients and customers in our various sectors - consumer, pharma, devices, diagnostics. We're looking at really transformative products that could make a significant difference in people's lives around the world. Of course, we have tremendous science internally, but that represents just a fraction of the global scientific innovation. We think by working together with the global healthcare community we can do a better job identifying new and valuable products for patients and consumers.

So I think that's really what we're here to do: drive value



through products that promote longer and healthier lives.

B&M: What do you think are the key success factors that are necessary to achieve your core objectives?

Patrick Verheyen: One KSF is surely about having the deep expertise needed to identify the opportunities. Experts are those people who have a very deep understanding of the basic biology, the fundamental problem of the disease, and connect that with the patient needs. If you have those people close, so that they can interact with academia, clinical centres, through the VC's, I think that's step number 1.

A second KSF are networks. Networks are extremely important. It is by working with other people in the industry, and outside the industry that you really refine your thinking and you get to a better result. If you can couple deep expertise over a really vast network I think we can make better decisions, be more efficient with capital and invest our capital on those ideas and concepts that will lead to the most transformative products, not just 3 years from now but in 10-15 years from now.

The third KSF I would say is about people. It's about conviction and the passion people have to really be successful in this space. I think that's critical. You need to have expertise. You need to have good networks. But you also need to have people with passion. You need to have people who have a long term vision and remain focussed on the science and remain focussed on the patient and can deliver.

B&M: And what do you feel is the biggest obstacle to your success? What is your biggest challenge?

Patrick Verheyen: For me it's about how do you spot ideas, products, and get conviction around those that will be transformative, or could be transformative, 10-15 years from now? How do we know this pathway is going to be a valid pathway, this type of antibody, this type of molecule or this type of small vaccine is going to be the best way to tackle this fundamental product rather than another one? That takes expertise. That takes being connected with the best in the world. And it takes the right expertise coupled with conviction.

B&M: Aside from the expertise, the networks, and the necessary conviction, are there any other factors that can help address the challenge of finding and commercialising truly transformative products?

Patrick Verheyen: There are factors that can complement them. Ensuring proximity of stakeholders is

important. I also think deal structure is very important, in other words how you collaborate. It's about ensuring you set up collaborations where the expertise is there, the network is there, and the people remain incentivised.

B&M: I'm guessing if you get all of the pieces of the puzzle right that translates into an enormous opportunity for J&J. What do you actually think is the biggest opportunity J&J has? And how do you think you can take advantage of it?

Patrick Verheyen: There are many opportunities. I think in the last 18 months with the innovation centres we have made great progress in integrating with the regional scientific landscapes and entering into new and exciting collaborations, but I think we are just scratching the surface. I think there is still a lot of opportunity across Europe in academic centres, in clinical centres, and emerging biotech companies. . And that means tremendous opportunity to get conviction around some great ideas and help those teams to bring them to the clinic and hopefully to patients.. I also think by working together and coming up with better plans, coming up with better visions, I think the industry as a whole can do a better job in attracting capital to bring those transformative products to market.

B&M: And have you seen evidence the innovation centre initiative is working? Can you point to some success stories?

Patrick Verheyen: I think because all our collaborations are all early stage and we've only been at this for a little over a year, we can't really say this product is now available to patients and it wouldn't have been. Check back, watch this space. What we can say is we've entered into collaborations with companies and organisations that we might not have met if we weren't where the innovators are in London, Boston, California or Asia Pacific.

> A great collaboration is one where the parties around the table are incentivised to really put their best expertise in. And a good collaboration allows the people throughout the partnership to continue to work with passion and conviction on the idea
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I can also say we have entered into more than 60 deals globally. Some of them are early-stage academic deals, some of them are already in early clinical stages of development, but they're all science led. They are all focussed on not incremental improvement but fundamental improvements.

B&M: So you would say these things are successful because they're science led, they're fundamental improvements rather than incremental, the deal structure is correct in each of them, and the collaboration is optimised?

Patrick Verheyen: Yes. Another feature is that there are for each partnership very strong internal and externa champions - people with true passion and belief it's going to happen.

Another perhaps unique aspect of our model is that the people who champion a transaction in the Innovation Centre, stick with that transaction, are accountable for that transaction until clinical proof of concept. It's not that we spot something, we find it interesting, we put a deal together, and then say ok, now you take it over There's accountability.

B&M: We've talked a lot about collaboration in the interview, perhaps you could just summarise for me what you think are the key elements of a great collaboration, a great partnership?

Patrick Verheyen: A great collaboration is collaboration where the parties around the table are incentivised

to really put their best expertise in. And a good collaboration allows the people throughout the partnership to continue to work with passion and conviction on the idea. So that means that the relationship needs to be transparent in goals and objectives and that requires a great deal of trust, otherwise people are going to lose their engagement, and engagement is critical.

B&M: And do you see this model of innovation centres, do you see that as the future for pharma in the early stage?

Patrick Verheyen: Well we're learning every day and it's going to continue to evolve. I think what is going to be the constant for us is that it's going to be driven by the patient need and led by the science . But I think we will go to a higher level of collaboration, and partnerships are going to get more complex. The industry is already very complex, there are governments, academics, biotechs, venture capital and plenty of stakeholders, so the way on how we are going to collaborate to really bring the right expertise together is going to get more complex. So I think we will evolve and probably get more comfortable in more broader, more diverse, more complex interactions between the various industry players or participants.

B&M: And within that complexity and evolution, what do you think is the biggest opportunity that will emerge from partnerships and collaborations in the future?

Patrick Verheyen: There is a shift already, and you see it happening, to earlier stage innovation. I think more and more the interest for earlier stage opportunities and the value it can bring to organisations and to patients is increasing. So I think there is great opportunity for innovators and entrepreneurs globally but also here in the UK to participate and help that translation of early science into products. And that is very exciting.

Our job is to create the opportunity for people who have innovative ideas and who are willing to take the risk to create new start-ups succeed in getting that idea to patients. And it's our task, our obligation, but also our privilege to work with those entrepreneurs and biotech companies to make them successful. That's really what drive me, is how can we help as an industry to help those people who really believe in an idea to say ok, I see this great science in Cambridge or in Cardiff or in the Netherlands and this is the plan, let's put a team together, let's bring capital together. It really puts a smile on my face if I can make those people successful.

B&M: So if what's driving you is to help these entrepreneurs and these start-ups to commercialise their great science, what is the converse of that, what is worrying you? What is keeping you awake at night?

Patrick Verheyen: Time. I don't see it enough. I see a tremendous opportunity to collaborate across all industry participants, but time is limited, patients need new products, there are still very significant needs and problems that haven't been tackled yet.

The science is there, there's a lot of people with passion, we need to build on the momentum and I kind of know that time is ticking. Let's move. I see a lot of opportunity, and I can get very impatient. I would like to do more and I think we can do more in a collaborative way and that's why I'm excited about what we are doing through the Innovation Centres.

B&M: If you look at the wider healthcare industry, is there anything in particular that really concerns you at the moment?

Patrick Verheyen: I think there is tremendous opportunity for the industry. And I think there is great momentum. I think we can do things even faster that would be great, if we could accelerate it and intensify our collaborations. I think that's the opportunity, and there is a lot of that happening already, and I would like to build on the momentum. I would say for the early stage that's the biggest opportunity we have, and also the biggest challenge. How do you create that openness? How do you create that high density of interaction?

B&M: One final question. If you had any sort of advice that you would like to give early stage biotech's looking to approach J&J, what sort of advice would you give them?

Patrick Verheyen: Come to us, talk, and reach out. We are looking to partner with all types of opportunities, early, mid-stage, late-stage, where people have the same scientific interest.

Another piece of advice: be prepared to have an open dialogue. We are going to be open, we are going to be as collaborative as possible and we will try to really help our partners to be successful. We also work with a lot of people who are not our partners and still try to give them our time. So be prepared and willing to open into an open dialogue, and I think if you are willing to have a dialogue I think good things will come from that ■

PANELISTS INCLUDE:

JEANNE BOLGER, VICE PRESIDENT, VENTURE INVESTMENTS, J&J INNOVATION DEVELOPMENT CORP. | **NIGEL PITCHFORD,** CIO, IMPERIAL INNOVATIONS

HAKAN GOKER, INVESTMENT DIRECTOR, MS VENTURES

FOLLOW-ON AND GROWTH CAPITAL: VC & CORPORATE VC

6pm-9.30pm, J&J Innovation Centre London, 1 Chapel Place, London, W1G 0BG

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Delivering a focus on excellence between industry and academia

Dr Celia Caulcott, Executive Director, BBSRC

Dr Celia Caulcott is Executive Director, Innovation & Skills at BBSRC. Celia trained initially in microbiology. Following her PhD she joined Celltech Ltd, and progressed her career with ICI Pharmaceuticals and the WellcomeFoundation/ GSK. Celia then became an independent bio-pharmaceutical consultant, working on projects for government departments and agencies including BBSRC and the Medical Research Council. She also worked for the Wellcome Trust, particularly the Sanger Institute. Before joining BBSRC, Celia was Research Manager at Imperial College. Celia's expertise is primarily in management of R&D programmes and technology transfer between academia and industry, particularly in the areas of genomics, biotechnology and biopharmaceuticals.
B&M caught up with Celia to discuss her role in developing and leading BBSRC's innovation strategy, including the strategy around the BBSRC campuses and the support for knowledge exchange and commercialisation.

B&M: Celia, you're Executive Director, Innovation & Skills at BBSRC, but can you briefly summarise what your role entails and where you feel you add the most value?

Celia Caulcott: I'm enormously privileged because I have the role of overseeing how BBSRC supports innovation from what comes out of the research base where we've invested.

The area in which my role makes the most difference is how the research base works with industry. For example, BBSRC funds about 20% of the life sciences PhDs in the UK. We want to make sure that those studying for their PhD's are not just trained to be researchers, but they're trained to be fit for the economy.

In my role, I'm working to get people to understand that knowledge exchange is multi-way, multi-dimensional, multi-purpose, and isn't just about the commercialisation of ideas.

If you invest in research and the research base, it needs to be accessible to users. I think an area where my role, and probably I myself has made a big impact is supporting this idea. If you put money inside universities and have great labs, great people and great ideas, somehow you have to make it easier for people to get at them. It's the whole argument about access.

B&M: Can you briefly outline BBSRC's current strategy around the support for knowledge exchange and commercialisation with academia. Which initiatives are you most proud of at present?

Celia Caulcott: So the first thing is that when people talk about knowledge exchange and commercialisation, they tend to have in their minds a narrow idea. We see knowledge exchange as the whole process by which knowledge and ideas move around. So what does

BBSRC do to support that? Well we've done some big policy thinking pieces – we've actually driven, across all the research councils, the recognition that knowledge exchange is not purely about the idea of becoming a company.

Big initiatives that we have? I'd point to four really major ones.

I've already mentioned studentships. We put quite a lot of money into studentships where industry are involved. Those are a really valuable, great way of enabling knowledge to move around.

We have Research Industry Clubs where we gather companies together in a particular sector to explore the challenges they face. We then look to see where the research base could engage and do great research that equally shares risk with industry – so that industry can actually learn the things to help themselves.

We also have the 'follow on fund' which you might call classical knowledge exchange funding. It's a block of money that people apply to when they already have ideas emerging from a research project with real commercial potential. The funding allows them to explore this potential and follow on with their ideas. The fourth area where I think there's big activity for the BBSRC in knowledge exchange is the 'catalysts'. You may have heard of the Biomedical Catalyst which is a scheme run between the Medical Research Council and the Technology Strategy Board (TSB). BBSRC is involved in two more such catalysts – the Industrial Biotech Catalyst and Agri-Tech Catalyst. They're great because they're designed to bring companies and academia together to do research and address challenges.

So what you can see in all of these initiatives, with the exception of the 'follow-on-fund' is building collaboration between business and the research base. Building collaboration, is in my view, key to enabling knowledge exchange.

B&M: How important is impact? Can you explain briefly what this entails and how BBSRC expects to realise its full potential?

Celia Caulcott: If you go back 6/7 years, when the research councils were first talking about impact in a big way, you could have regarded it as an initiative. But in many ways, impact is a way of thinking.

What the research councils have done is used it as a way of saying to the research base that they need to think about what difference their research will make. The outputs and outcomes of excellent research will make an impact for the good in some way or another, at some time or other, in some place or other. We actually want people to think a little bit more like that. It's pretty clear that government ministers are very supportive of it. In the UK when funding research, the government wants to know that a difference is being made.

B&M: Can you provide an overview of UK work being done with UK research and innovation campuses and how you see them relating to the wider UK innovation eco-system?

Celia Caulcott: Research innovation campuses are incredibly exciting. They're an opportunity to accelerate the whole impact of the research investment we make. But what defines the research and innovation campuses is the presence of one or more significant research institutes – not institutions, not universities: institutes that have got long-term funding from a research council and have a national purpose.

At the moment, I think one would say there are four of these research parks and innovation campuses in the UK: Harwell, Babraham, Norwich Research Park and Daresbury.

Babraham is one I've been very intimately involved in over the last three years. If you look at the Babraham research campus, we've made major investments here since 2011. Two new incubator buildings for new companies, both full already, and a third such building going up now (and virtually full before completion). Double the number of companies on the campus that there were a couple of years ago. We've also enabled the reordering of some facilities at the institute to make these more accessible to companies which is fantastic.If you go to Cambridge University, that will say that 'Babraham is the place to get the small life sciences companies going'. It's nicely complimented by some of the things happening up at Addenbrooks, so you have a bio-medical focus up at Addenbrooks, eventually around AstraZeneca, and a life sciences focus down at Babraham. This is really building the ecosystem. Then you've got the other science parks that companies can move out to when they get bigger. It really works.

B&M: What do you see as the challenges to realising the potential of the Babraham campus?

Celia Caulcott: Often , what emerges as one of the biggest challenges is when a company grows and

I do believe that partnership and collaboration between industry and academia is most effective where there is a focus on excellence. Excellence in research, one of our research council mantras, but also excellence in industry as well.

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doesn't want to leave. Babraham is designed for small companies so there's a challenge about how you build the regional infrastructure. It's almost a cultural infrastructure that enables companies to say 'Ok I'm too big for where I am now – I need to go somewhere else'. Equally, I actually feel that there are going to be real opportunities in that space.

B&M: What are the key factors in your mind that make for successful industry-academic knowledge exchange and collaborations?

Celia Caulcott: What makes for the most successful collaboration,is a partnership – a recognition that everyone brings something to the table. It needs to be an equal partnership as all people have ideas, knowledge and thus everyone learns and benefits. The recognition of mutual benefit really makes a great collaboration. There's got to be something in it for everybody. I know that sounds rather selfish, but the truth is that most of us are at least partly motivated by seeing a benefit.

I do believe that partnership and collaboration between industry and academia is most effective where there is a focus on excellence. Excellence in research, one of our research council mantras, but also excellence in industry as well.

B&M: What still needs to be done to make industry-academic collaborations work more effectively? What role do you see BBSRC playing in this?

Celia Caulcott: If you end up in a situation where there are problems with expectation, that's an issue. If people are not clear at the start about what can and can't be done, there are real difficulties.

It's one of the things that I always say to companies when first engaging with the research base. If they have to solve an immediate problem, the research base might not be the place to go. You go to the research base if you have a medium to long-term problem where you cannot afford to take the risk; it's too big, too complicated and too far away. So understanding what can be done, what people are good and not good at is really important. If you get that wrong and expectations are wrong, it's not looking good. I think if there isn't discipline in the relationship there can be real risk. I think expectations and poor management are probably the two things you have you have to look after really carefully.

So often, the best collaborations are built from knowledge and engagement. You don't start by trying to do a research project together: you start by getting to know each other. By getting to know each other's needs and interests.

B&M: What is the single biggest opportunity for BBSRC at the moment in terms of progressing the industry-academic collaboration model in the UK? How will you realise this opportunity?

Celia Caulcott: Now is a really exciting time to be involved in bioscience. The things we are achieving, such as advances in the understanding of the human genome, genomics and manipulating DNA are providing exciting opportunities. There is huge potential coming through, and we've seen it very strongly from big data through to synthetic biology.

I actually think the Catalysts I mentioned are some of the most exciting opportunities we have in terms of our funding activities. This is because they offer a degree of flexibility to academia and industry, partnering together to effectively ensure science makes a difference.

If we look at the Industrial Biotech Catalyst, that's absolutely focused on the idea of bringing and accelerating bioscience outputs into industrial processes and we know that's going to make a huge difference. The Agri-Tech Catalyst is doing the same in the agri-tech and food space. The opportunity is that bioscience is incredibly exciting.

B&M: And conversely, what do you see as the biggest hurdle or challenge to realising that opportunity? How could see BBSRC address those challenges?

Celia Caulcott: We would be pleased if there was more funding for the catalysts as the quality of demand is fantastic.

£45M for the first and second round of the Industrial Biotech Catalyst has been provided between BBSRC, TSB and the Engineering and Physical Sciences Research Council, but the quantity of money is undoubtedly an issue to meet demand.

There's also a need for capital if we are going to translate some of the biotech outputs into industrial practice, such as the need for demonstration plants which is extremely intensive. It's inevitable that funding is always challenge and we all have to work with this challenge.

B&M: How does the UK life science sector continue to "capitalise" on that progress? How can the UK continue to compete on the international market by encouraging greater collaboration?

Celia Caulcott: The UK is well positioned, but it's also challenged because many other countries are investing strongly in their research and development bases. This investment is often more than the UK makes and that's a generally known fact. We need to understand what we are good at and support these strengths. It's very clear that we're good at a great swathe of life sciences research, but not all aspects.

There are also things we have no control over, for example the whole piece around Pfizer and AstraZeneca – that kind of thing can just happen. We just have to learn and understand how to cope, respond and deliver on what the UK is good at. I think that building on our strengths and making sure they are communicated externally is very important ■

Fuelling the academic-industry dynamic

Malcolm Skingle CBE, Director, Academic Liaison, GSK

Malcolm Skingle manages Academic Liaison at GSK with staff in Stevenage, Research Triangle Park and Philadelphia. His role involves close liaison with several groups outside the Company e.g. Government Departments, Research and Funding Councils, Small Biotechnology Companies and other science-driven organisations. He sits on many external bodies including several UK University Department advisory groups. He also chairs a number of groups including the Diamond (Synchotron) Industrial Advisory Board, the Cogent Science Industry Partnership Board driving skills for the life sciences sector and the ABPI group working on academic liaison.

Malcolm imparts some of his 35 years of experience in the management of research activities as he outlines the importance of stronger a academic-industry dynamic and shares his experiences at the interface between academia and industry.

B&M: Malcolm, you've been Director of Academic Liaison at GlaxoSmithKline for approx. 15 years now. Can you briefly summarise what your role entails and where you feel you add the most value in your role?

Malcolm Skingle: GSK have got more than 10,000 scientists globally. We publish some great science but we obviously need access to more science than we've actually got in-house. We then have to have people who think differently about science so where I add value is pulling in funders and scientists who want to work on scientific areas that help underpin our research.

B&M: How important is that academic-industry dynamic and interface for GSK right now. How high does it sit within GSKs strategic priorities?

Malcolm Skingle: It's very important. Most companies now realise they need to work with Universities more. In the UK its particularly good that the UK Government are being so supportive of science and the HEFCE Impact agenda is actually changing the culture with academics for the better. For the very first time there are a majority of academics who are thinking about the potential commercial impact of the research they are undertaking. The Pathways to Impact agenda, with the various UK research councils is getting academics to think about their science in a more strategic way, and we see that of great value to us. I've always seen the value for the last 20 years in working with academia but I think through a number of successful, targeted Governmental initiatives, the academic sector has become more amenable to a far broader audience of investors and partners, and that's great because that's what I've been doing for the last 20 years.

B&M: You talk about the interactions between GSK and academia and looking to be that partner of choice but what is it that makes GSKs approach so unique? What do academics see in GSKs offering?

> We're benefitting from a diverse generation of scientists, experts, entrepreneurs who are striking out and looking to try something different, which can only be a good thing for UK science
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Malcolm Skingle: I'd like to think that GSK always does the right thing with their academic partners and a smart academic partner would look at the track record of a company like GSK and see a natural synergy, see the value in engaging with us, and see success stories that emanate with their own science. It's something we've been able to build upon for many many years. But simply put, its about selecting the best ideas wherever and whenever we see them and moulding them into our own world. I've had companies come to us and ask me how we do things and when people want to emulate what you're doing that's always a good thing.

Its also about knowing when the engage with other pharma companies. Two years ago we were going to be spending some funding in Manchester University, in the area of imuno-inflammation. They had a critical mass of people, they needed more people to make it the all singing all dancing unit but I actually approached AstraZeneca before I approached Manchester to see whether they'd be up for co-funding, and they did. We put £5m in and they put £5m in and then later, Manchester agreed to put £5m in. We didn't leverage any funding at all and then we went out and got additional recruits, we got representatives from places like Harvard and Imperial to drive it. It's underpinning research that we tap into and we know when we seed science like that it works as the multiplier.

B&M: What is it about that in your mind that makes for a successful early stage collaborations? Is it the synergy, the research, the people you are working with?

Malcolm Skingle: The world leading science bit is taken as a given. We don't work with Division 2 people, so then it's down to who actually wants to work with you to develop the science. There are 'take the money and run academics' and there are people who genuinely want to actually work with you to drive the science forward. That can equally be companies and academics alike. Open communication and transparency and managing Chinese walls, so people like Professors Philip Cohen, Dario Alessi and Mike Ferguson up in Dundee, these are people who know how the game works. They know there's information they can share across the whole piece and when you think about it places like Dundee that get access to the chemical diversity of half a dozen major pharma companies through collaboration.

B&M: You mentioned the TTO interaction earlier in the interview. How important is their role in what you are doing?

Malcolm Skingle: For a decade I've been on the board of PraxisUnico, a training organisation for Tech Transfer Organisations and representatives. The reason I do that is because once or twice a year I will go and teach or give advice on one of their courses and it gives me the opportunity to get to 40 or 50 universities in one hit so they can be very open. I will tell them exactly why we do what we do and how we do it. As a consequence of that we get into positions where its easier for GSK to establish relationships and put agreements in place. So in short TTOs have always been important to GSK, its how we look to engage that offers us a differentiator to other Pharma companies.

B&M: Do you see that as the greatest opportunity for you and what you're doing in GSK? It's developing not just collaborations across disciplines, but also across multiple stakeholders?

Malcolm Skingle: Definitely, and it's joining people up also. In the old days Universities would always tell you they were the best at absolutely everything, which obviously can't be true. Many of our collaborations will not only put different disciplines together but different Universities also. We'll be open with them and get them working together as on the most part they

instinctively want to do it if they don't see the other side as competition.

But everyone gets that now. Within the EPSRC, I chair a an Advisory group once a year up in Edinburgh, and they've got a collaboration with Herriot Watt and Bath, photonics, physicists, A&E physicians, chemists and materials people. 10 years ago you'd have never pulled that group together with funding in the EPSRC world.

B&M: What do you see as the challenges to that type of dynamic? Is it the sheer volume of science that is coming out of these universities?

Malcolm Skingle: You can only fund so much, we are not a research council. There has to be something in it for GSK. But I think you can get to where you need to be fairly quickly if you're honest. Most people will respect that level of bluntness because they don't want to waste their time.

Also I participated in something at Clare College a couple of months ago, it was all about big partnerships, a number of large blue chip companies were present. The IFM, Institute for Manufacturing organised it. A couple of things that really struck me was how a lot of the big companies were saying they're going into far fewer larger collaborations. I only agreed with that to a point. I think there's still pockets of excellence in universities that you wouldn't expect. And I think you don't want to go too far down the all the eggs in one basket. You need critical mass to drive science and diversity so you shouldn't be completely closed to certain sources.

B&M: How have you seen your role changing over the years in terms of interactions with relevant

funding bodies and industry players as well?

Malcolm Skingle: I think governments now actually want a slice of the science base. So Singapore for example, there are tax credits on manufacturing presuming you spend enough on R&D. Wise move, you get a bit of a science base, we've got quite a big unit in Singapore like other countries, and it is a strategic relationship. I think the developing world science bases have got stronger since we've been doing this. The great thing about the UK is the pragmatism, most of the academics, the senior people, the funders, we're very lucky to have The Wellcome Trust in the UK, it's a great organisation for driving a better science base. But I work with multiple co-funders in multiple countries, eg Genome Canada, Invest in Denmark, Science Foundation Ireland, MRC in Africa. It's truly an international game, and with all these initiatives going on, it only helps my role for the better.

B&M: Looking at the industry a littler broader, it's very buoyant in the UK at the moment. How do you think the industry can continue to capitalise on what's happening at the moment in terms of funding, investment, success stories? What needs to happen to continue that progress?

Malcolm Skingle: It's a great place to do your science, but obviously the lack of risk taking culture in the UK has been detrimental. To fail is not seen as an option in the UK. Whereas in America it's like getting your PhD, if your first company fails you just go on and do your next one. What needs to be done is we need to continue to promote entrepreneurship and entrepreneurship training and there's a lot of good stuff going on. I bumped into Steve Caddick on the way to this interview, he does a great job at UCL in that space. The more open and honest the dialogue is the better. There are still academics who think they can take a molecule all the way into a medicine. That's nonsense because they wouldn't have the skill, if it was that easy we'd have already done it and been millionaires. The more you can do to link up good advisors, good networks to increase that communication the better in my opinion.

One of the good things about the consolidation of the pharmaceutical industry of late is as companies have merged the people who have left those organisations have then populated biotechs. So we're benefitting from a diverse generation of scientists, experts, entrepreneurs who are striking out and looking to try something different, which can only be a good thing for UK science.

I also think the mentorship dynamic is important for a dynamic and vibrant sector. Some say there's a shortage of management talent to drive companies in UK, but I see that changing now, and we are now seeing people with both the capabilities and also the personality to build an idea. You need to know your science but you also need to be able to talk to people, tell a story, build a vision and look people in the eye.

B&M: A lot of what you mention in terms of opportunity is around management, so conversely do you see management also as a challenge to realising the potential of this industry?

Malcolm Skingle: On the most part yes. There are people who are a great fit for a certain time in the life of the organisation, but once you pass that point they become a hindrance. Sometimes you'll have the founder academics who actually love the idea of the Porsche in the car park and driving something through to utility, but actually they really want to be an academic, they just don't want to lose control of what they've started. But companies as they go through an evolution need a different type of person to take them to that next stage; some people don't realise that soon enough. I've known entrepreneurs who have started up companies and want to run it, then fall out with their Board, then leave to start another one. That's good, it's healthy. It means the company is passed onto more capable hands, capable of moving forward to a more advanced stage and is finally adding value to its employees, its market and its investors.

B&M: In terms of academic entrepreneurs looking to engage you in discussion, what is it you look are looking to hear to warrant further conversation? And if you could impart one piece of advice on an entrepreneur looking to engage with a pharma company to progress their research, what one piece of advice would you give them?

Malcolm Skingle: Strong science would be the underpinning thing that I would want to hear, that's what pricks my ears up. A good strap line that goes with it, what is unique about it, what is the competition. And a bit of personality, for someone who is going to drive it.

In terms of advice, I would say know your market, know where you fit in the competitive landscape. If you start talking to a company and you clearly don't know what the competition is then, particularly on the scientific side of things rather than the commercial side, you're going to lose credibility. Do your homework, know your competition, know how it fits into the organisation that you're trying to pitch to ■

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Finding, Funding and Fuelling exciting early stage bioscience

Dr Allan P. Marchington, Partner, Apposite Capital

Apposite Capital is an independent investment firm focused exclusively on Healthcare. The firm has an in-depth sector knowledge covering key aspects of the healthcare industry internationally coupled with local insights, a well established brand and a strong healthcare network.

Allan Marchington is a Partner at Apposite Capital. A proven entrepreneur and executive in the pharmaceuticals sector, Allan talks to us about the challenges of finding and funding early stage bioscience, the opportunities emerging as a result of the NHS opening up, his view on how the investment landscape is changing and the key success factors to successful investments.

B&M: Let's first talk a little bit about Apposite Capital. Give us your elevator pitch, what is Apposite Capital and what makes it different?

Allan Marchington: One of our key differentiators is that as a group we're a mixture of people, entrepreneurs, banking experience and investing experience that looks across not only life sciences but also healthcare services. We have an exclusive focus on healthcare and we do it from the angle of building and growing businesses, as well as bringing in the financial investor aspect of that. We also invest globally - both in the UK, continental Europe and the US.

B&M: In terms of your role within Apposite, where do your particular strengths lie?

Allan Marchington: I'm a chemist by training, starting at Pfizer, and then setting up my own company, growing it and selling it successfully to Millennium Pharmaceuticals. I joined, Millennium's management team as part of the acquisition. Millennium was a NASDAQ listed company and provided me with some great experience of the US public markets and US investors. I then came back and moved into venture capital. My bias is really on starting, growing businesses. Some of the challenges in growing companies is dealing with people, which is probably one of my strengths, as well as spotting innovative new scientific opportunities.

B&M: Do you have preferences at the moment in terms of where you traditionally invest, stage of development or geographical nature of those companies? Where are you seeing opportunities?

Allan Marchington: We invest across all stages, start-ups, mid-stage, and growth investments in both Europe and the US. It's 'horses for courses', its where we can see we can make money.

Where we see a major opportunity today is certainly in the technology enabled healthcare service sectors and in medical technologies particularly in the UK where the NHS is opening up. They've created academic health science networks (AHSNs) and Academic health science

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centres (AHSC), in each region and we're interested in seeing what they actually throw up and what opportunities they bring both in terms of getting better outcomes for patients and also be able to make money for our investors at the same time.

B&M: In terms of financing early stage innovation be it biotech or academic entrepreneurs, do you have a particular approach that Apposite uses when engaging early stage science?

Allan Marchington: For us, the science has got to drive a lot of the investment so a lot of people come in to see us and maybe don't appreciate we want to understand the science first and foremost or what the technology does and why it's better than what's currently out there. That's a key driver for us and really understanding the fundamental mechanisms or the reason why one device or drug will work over another, is paramount.

Once we've got over that hurdle of the science and the opportunity, then it's down to the people and have they got the ambition, the vision and the operational excellence to actually drive it to where they want to take it.

Sometimes there are limited resources in place but if the science is good and the idea is good, we'll wrap other people around it to actually make it a success. People are key to great companies but they're not absolutely required in the early stage investments whereas great science is, as it will attract great people.

B&M: What is the most difficult challenge you're facing?

Allan Marchington: Over the last 5 years the IPO market has been shut so the only exit you're ever going to achieve for your company is really going to be an M&A and the people who are going to do an M&A are the large or the medium to large corporates. In the biotech space it's really about predicting what's going to be interesting to those companies in 5 years' time. That's the challenge.

What has changed for me is not trying to predict that but trying to do what's sensible in your own mind about where you think the opportunity is and changing patients' lives, changing clinical outcomes and if that happens then corporates will almost certainly pay for that product, if the market is big enough and the price is right. So rather than trying to second guess it, you just follow your gut in terms of where the opportunity is and how you're going to change the clinical practice.
In healthcare services, the challenge is based on the practice of medicine in the National Health Service and in the private pay market and just trying to predict that as well. The interesting thing, in terms of therapeutics and devices, is how the services are used which can then can help you predict which devices and which therapeutics are going to become most interesting in an NHS setting. The NHS is ahead of other countries in understanding the health economic pressure of providing affordable quality healthcare. Given the downward pressure on payers across the World new technologies and services in the NHS funded by us, will almost certainly translate to other regions of the Globe.

B&M: What do you see as the most challenging part of your day to day job?

Allan Marchington: The challenging part is once you've done the investment is ensuring it stays on track and you deal with the ups and downs of any business. Making the investment is relatively easy, managing and exiting is the hardest.

B&M: What do you think are the success factors to doing that correctly?

Allan Marchington: Communication, realistic

expectation on goals, having a management team that delivers and actually does what it said it would do. Having a supportive, active and experienced board is also a big part of it. It's back to relationships and it's back to people.

B&M: What's getting you out of bed in the morning, what's making you look forward to going to the office?

Allan Marchington: A couple of things, but at the minute there are a number of exciting opportunities emerging as a result of the NHS opening up. There are loads of super smart people who have some great ideas who've never really looked beyond the NHS to get real access to capital to take those ideas from concept to fruition and really change patients' lives.

That's the thing that really excites me at the minute, there's a world there that is still mostly untapped.

B&M: Who do you think is best positioned to take advantage of that opportunity?

Allan Marchington: Probably the NHS actually. They are trying to work out how best to do that given some of the challenges related to the public perception of private financing of the NHS, which can be a difficult concept for some people. There's an education process that's needed to explain how it can be achieved and still meet all the NHS values that were laid down in 1948.

B&M: A quick question about TTOs: what is your perception at the moment of the state of the TTOs in the UK, is it in a good place, does it need a lot of reform?

Allan Marchington: TTOs have a very difficult job to do. They've got a mix of technologies, they're dealing with academics that are extremely bright and will push for their idea but have a mixture of understanding of how to spin out a company. Can it be improved? Yes it can always be but overall they're pretty good.

B&M: What do you think are the ingredients to a successful TTO? What do successful TTOs do right that other TTOs do not?

Allan Marchington: Successful TTOs reach out to VCs and investors in the right way.

B&M: What is the right way and can you elaborate on that?

Allan Marchington: They have an understanding of

what a VC is looking for in an idea, they package it well and they're pretty open and realistic in what they have. Their IP policy is clear and they give the academics the right advice and guidance in improving the idea they have.

B&M: Where do you think most TTOs fall down, what's the most common obstacle they fall down on?

Allan Marchington: They have a tendency to overvalue the technology sometimes given the stage it's at and they don't always look beyond the borders of the UK for competitive technologies. There may be other IP, universities working on similar things in other regions that could be superior. So it's really having that holistic view of the IP landscape.

B&M: How do you see the investment landscape changing? We've already talked about pharma having an appetite for earlier stage investments. What ramification does that have on the use of VCs?

Allan Marchington: I think it's great because in the UK and Europe there aren't that many early stage investors that are out there so there's a real shortage of capital for early stage ideas. For me the more people that are interested in an idea the better so it is easier to syndicate deals, and mitigate your risk effectively because not everything you invest in is going to be successful. Pharma brings a lot of advantage in terms of access to know-how, knowledge, and an internal understanding of the science. On the down side there is a risk sometimes that the pharma company can suddenly change strategy overnight and pull out of an area deciding they are not going to invest further. Instantaneously, you've lost your co-investment partner. It doesn't happen so much, these days but in the past that's been a risk with corporate investors.

B&M: What are some of the other pros of syndication with pharma?

Allan Marchington: One, Corporates are a potential exit route for the investment although that's not always the way. Two they bring validation as they typically have someone internally who is an expert in the space to look at the science and opportunity. Three they're very good people who've had operational experience and four they've got deep pockets so you know they're not going to run out of money.

B&M: The cons against that process?

Allan Marchington: the changes in strategy. That's the largest risk. I don't see integrity and leaking into the research organisation as a risk at all.

B&M: How do you view the UK bioscience industry at the moment? Are you positive about it's prospects?

Allan Marchington: I'm actually really positive, it's fragile but I'm optimistic it's going to grow; there's a lot of capital coming from Europe and the US to the UK. A lot of people see it as a very strong science base and there's capital coming in and if capital comes in then we've got more shots on goal to be successful and if that's the case then success will bring success and it will grow.

The challenges for me are in order to grow substantially large companies we need a strong public market in this space and unfortunately it isn't as strong as I'd like it to be. We are seeing a few early green shoots of IPOs but we need more generalist investors to come in and actually push the IPO market harder. Most VC syndicates can afford to invest maybe $100m in a new company but beyond that it gets very difficult because you've got the concentration and risk exposure effects. So the only way you can actually build a substantial company is by accessing other sources of capital. An IPO route is extremely important to build large companies in the billion dollar range valuations. Until we have a strong public market we're never going to get that because there isn't enough capital.

B&M: How do you think companies should best position technology and themselves to raise capital?

Allan Marchington: They need to be realistic, have a transformational vision on what they're going to do with the technology, and a clear strategy that shows you can make money out of it and it's actually feasible on a reasonable amount of capital. What many people do is they come with a very bold vision but then when you work out the amount of capital required to get there, it falls down; or they come with a great plan but their ambition is quite limited and so you can't see how you're going to get your return. The trick is to present the plan where you can see a good return and behind that, show clear steps on how you're going to get there.

B&M: Finally, if you could give one piece of advice to a start-up looking to raise capital, what would it be?

Allan Marchington: Focus on the science and understand the science fundamentally because that's what's going to drive the investment interest ■

Banking on biotech: a prescription for alternative financing

Nooman Haque, Director of Life Sciences, Silicon Valley Bank

Nooman Haque is the Director of Life Science at Silicon Valley Bank in the UK, responsible for marketing its products and services to the life science market, including therapeutic companies, medical device companies and digital health companies. SVB, a relative newcomer in the UK, is making waves with its novel approach to banking, offering deep sector insight and access to its network of industry connections to life science clients and investors. Nooman talks to us about some of the major trends he's witnessing, when the circumstances are right for venture debt financing and some key words of advice to bioscience companies seeking finance.

B&M: What financing trends are you seeing at the moment?

Nooman Haque: VC funding continues to shrink - there's been a big shake-out in the number of VCs across Europe as a whole. Two things have been responsible for picking up the slack and maintaining overall funding levels in the market: government funding, particularly in early stages, and we've also seen a rise in corporate venture capital from life science firms.

B&M: What are the most common concerns and questions clients have around your offering and the financing environment as a whole?

Nooman Haque: The concerns that businesses have around the financing environment are really about raising additional money. It's never been cheap to start a biotech company or a medical device company! With VC investing getting tighter and some syndicates having to get bigger, it becomes very tough. However, the greater challenge comes when you look beyond seed and series A investing in the life science sector, and consider the lack of availability of follow-on or pre-IPO finance for these businesses. Venture capital can only take a company so far and there will come a point when businesses need to source funding beyond the realms of the VC world.

The US has a very open public market, but in the UK and across Europe listing hasn't really been an option. While we have witnessed a few successful listings this year in the UK, it's not a common route to raising money at present. Scaling is therefore one of the biggest challenges for high-grow businesses. As corporate venture capital increasingly flows into the sector, it will be interesting to see whether it can help to support young businesses at this later stage in their growth.

B&M: This is the valley of death of funding that you're speaking about?

Nooman Haque: That's right, it has all sorts of names and doom and gloom. Businesses in the so-called valley of death are twiddling thumbs or being spoon fed, hampered by a lack of investment and facing the next inflection point which needs a significant amount of capital.

B&M: How do you think that is best addressed?

Nooman Haque: One way is to ask the question, 'Can we get more done sooner?' By pushing early stage funding to work harder and support deeper programmes, businesses can build a stronger IP portfolio and therefore improve their business case to secure future finance and ultimately list.

The other major factor is that we are in a relatively poor public market for deals at present, something that needs to be addressed over the long term.

B&M: The public market environment is obviously hugely important. What are the ingredients that are required to make it more conducive for biotech investments?

Nooman Haque: A significant factor that is hindering the current public market is a lack of industry education amongst the broker community. There are very few brokers that understand the sector well and as a result, investors are failing to become interested about early-stage life science businesses.

The UK would strongly benefit from greater depth and breadth of knowledge amongst the analyst and broker community to advise venture capitalists and angel investors on market developments and exciting ventures.

For the businesses themselves, consideration must be paid to the experience that the senior management team, and the CEO in particular, have when it comes to taking a company public. It is critical to be able to tell a compelling story about your business and be a thought

"A significant factor that is hindering the current public market is a lack of industry education amongst the broker community"

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leader on the wider industry. This will help to publicise the life science sector as a whole and make it a more appealing investment target.

B&M: Where do you see SVB's role in this? We talk about getting a better public market environment, does SVB have a role in order to achieve that so what is it?

Nooman Haque: Silicon Valley Bank aims to challenge the traditional financial services model, focusing our efforts on building deep industry knowledge to support our clients and partners. We are dedicated to the innovation economy and to us, life science is a critical part of that. Our specialist life science team has a responsibility to demonstrate to the investor community that it's an exciting and profitable sector.

There is a need to educate generalist investors a little bit further and we're happy to invest that time.
To be clear, Silicon Valley Bank is not an investment bank so we're not going to be the ones trading on lists ourselves but just the virtue of being a commercial bank in the sector with strong connections and knowledge means that we are in a great position to share that with others.

B&M: Educating generalist investors is a key goal of Biotech and Money. How do you think that is best achieved and what do you think generalist investors need to see in order to invest in biotech?

Nooman Haque: It comes back to knowledge. I'm a fan of qualified pitching events where you put generalist investors and brokers in front of some of these early stage companies, not necessarily those that are looking to list, but just to show them the pipeline of companies that might be looking to list in four or five years.

In terms of effecting real change, it is critical to show brokers and analysts how budding, early-stage life science businesses develop over time. It's not sufficient to pop up on an investor's radar with an immediate need for capital – the business and investor community

Venture debt is most suited to situations where it has the support of investors. It's wrong when it's your only option - when all else has failed and you think debt is going to be the solution

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must take time to build networks that pay dividends in the longer term. I'd like to see some sort of platform that gives industry players visibility into some of these companies and how they develop over time. How much better would it be if you're an investor and I'm a CEO and we've already met two, three, four times before I even go public?

B&M: You talked about CDCs and other sources of funding or investment coming a bit earlier in the chain. In terms of non-dilutive financing options such as venture debt or things like that, where do you see that trend going? Are you seeing more clients being more open to exploring those types of non-dilutive financing options?

Nooman Haque: Venture debt is an important part of the Bank's service offering and we have had a lot of interest from companies wanting to look at it as a solution.

Venture debt is a very useful tool in the right circumstances but it can't help everyone.

It's a product that hasn't been around in the UK market for very long. It is sometimes not well understood and as a result, it's not always had a great reputation. We spend a lot of time educating clients on exactly how we execute on non-dilutive finance solutions and what the implications are for a company of that profile.

B&M: When are the circumstances right for non-dilutive financing?

Nooman Haque: It's almost easier to talk about when the circumstances are wrong. It's wrong when it's your only option - when all else has failed and you think debt is going to be the solution. The simple way of putting it is that we view venture debt as being part of the solution, not the solution itself. If you're opening gambit is, 'I've been trying to raise a financing round. I am yet to secure equity but if you can lend me money for six, nine or maybe 12 months I'm sure I can secure a deal and turn something around'. There are so many alarm bells that it's self-explanatory as to why venture debt is not a viable solution for the business.

Venture debt is most suited to situations where it has the support of investors. It can be part of a solution where a modest amount of non-diluted finance gives a business an extra option to develop more IP or factor in more time but it doesn't cripple the company and it doesn't leave it with a binary situation of 'if this goes well fine, if it fails, I'm looking at a write-off'.

We want to work with early-stage companies and provide them with tailored lending and banking services that enable them to be successful. We hope that by working closely with businesses and their investors, we are able to forge long-term relationships that result in the UK hosting more large corporates in the life science sector in the future.

B&M: So if you had some advice to give to biotech or bioscience companies looking for alternative financing what advice would you give them?

Nooman Haque: Engage early. Don't leave it too late. I have companies that phone me and say that they are just putting an equity round together and they won't require debt for another 18 months. My advice is that they need not necessarily take on the debt now, but fully understanding and opening your options with 18 months' lead time is a more prepared approach. By forward planning non-dilutive products as a complement to VC funding, businesses can in effect secure longer financial support for research programmes and early stage development.

B&M: How do you see the commercial banking

sector changing over the next 12 to 18 months? Do you see a big shift in what banks like yourself are offering or what is being demanded by clients?

Nooman Haque: The regulatory environment for banking is changing all the time, so that has a big impact on both investment and commercial banks. In terms of how that affects Silicon Valley Bank, we see it as an opportunity. We specialise in sectors which have been underserved with a proposition that goes beyond traditional banking. Our growth across the breadth of the innovation sector highlights that this approach is met with positivity in the market.

At Silicon Valley Bank, we like to describe what we offer as a mile deep and an inch wide. Our coverage is very narrow and focused entirely on the innovation sector and its investors, but it's incredibly deep.

In terms of the industries we serve, over the next 12 to 18 months technology will undoubtedly remain a hot sector. In biotech specifically there will be companies that go out and make extraordinary valuations that they fail to deliver on but overall it will continue to experience a modest growth.

Both sectors are becoming more and more important and as a result, investment into them is only going to continue, whether it is from corporates or from traditional VCs as well.

The consumerisation of technology remains a prevailing trend. As technology becomes less distinct from the sectors that it has an impact on, it becomes more ingrained in society and culture as a whole. Health is a simple example, with the rise in digital wearable devices

in the consumer world now beginning to cross over into a clinical environment.

B&M: What role do you think SVB can play in helping the continued upsurge in UK bioscience?

Nooman Haque: At the core, we lend to early and growth-stage companies and that gives concrete, practical help. But our approach also brings an opportunity to share knowledge and open our network in order to really champion the life science sector. Our team at Silicon Valley Bank enjoys working in the sector and we get enormous satisfaction in going beyond what is expected of a bank and trying to do whatever we can to help life science businesses and their investors.

B&M: What one piece of advice would you give to start-ups looking for those financing options? What would you say they must be aware of before engaging with you?

Nooman Haque: I have some general advice, which is to just think about where you're going. You've got to really think through the implications of where and how you get funding rather than just taking the cheque. Having a financing plan for the long-term or at least just thinking about what the options and implications might be is hugely important ■

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