

Summary of the dinner with Dame Ann Dowling, 9 April 2015

Overview

In late 2014, Dame Ann Dowling DBE FEng FRS was asked by the then Minister for Universities, Science and Cities, Rt Hon Greg Clark MP, to lead a review examining how government could support the development of more effective collaborations between businesses and university researchers in the UK. In January 2015, Dame Ann announced a call for evidence, to which the Academy of Medical Sciences responded.¹ In our response, we highlighted several key points:

- In the life sciences sector, the NHS also has a crucial role to play in facilitating productive, long-term partnerships. Although progress has been made, more remains to be done to make the NHS an attractive place to conduct research.
- A key barrier to such collaboration is the cultural gap that currently exists between researchers working in industry, academia and the NHS. Of particular concern is the belief that scientists must compromise their intellectual principles in order to work in a commercial environment.
- Freedom of movement between industry and academia is key to bridging this cultural gap. Multiple stakeholders have a role to play in facilitating the flow of personnel between industry, academia and the NHS.
- Sustained government investment in innovation is required if long-term benefits are to be delivered, and continuity over the coming years is needed if researchers are to gain knowledge and experience of the available routes to collaboration.
- Current VAT rules are a significant disincentive both to university-university and university-business collaborations.

At the request of Dame Ann and with the support of the Royal Academy of Engineering, on 09 April 2015 we hosted a dinner, chaired by Professor Peter Weissberg FMedSci, to further discuss these and other issues. This was one of a series of events organised as part of the review and provided an opportunity for Dame Ann to hear the views of Fellows and others with direct experience of university-business collaboration in the life sciences. It is hoped that this discussion will help to further inform Dame Ann's work, ahead of publication the findings of her review in May 2015.

This report summarises the key areas of discussion and does not necessarily reflect the views of all attendees or of the Academy of Medical Sciences.

A list of attendees is included as Annex I.

¹ <http://www.acmedsci.ac.uk/viewFile/54fd69cf7d54f.pdf>

Key discussion points

Culture: Attendees highlighted the cultural gap that currently exists between researchers working in industry and academia, in large part because of the small number of 'bridge-crossers' who had experience of working in both. This gap was considered to be one of the biggest barriers to successful collaboration, as it undermines trust and understanding and hampers the development of productive working relationships. Attendees stressed the importance of closing this gap by increasing the two-way flow of personnel, at all levels, from undergraduate upwards. One way of achieving this is through secondments and short placements, which allow individuals to 'dip their toe in the water' without making a long-term commitment. Such secondments are a feature of the AstraZeneca-MRC Lead Discovery Centre, in which MRC-supported researchers work side-by-side with industry scientists in AstraZeneca's high throughput screening group. Attendees encouraged the government to incentivise such initiatives.

It was acknowledged that academics and industry researchers tend to have different mindsets – the former are adept at curiosity-driven research whereas the latter are more focussed on delivering milestones. It is right that these differences exist, but there needs to be mutual respect for these alternative ways of working. Negative perceptions of industry were discussed and it was noted that the majority of universities do not have a policy on conflicts of interest in relation to business-university collaboration. It was felt that there is a need for institutions to provide better frameworks to support academics who wish to work with industry. These should be made publicly available to help dispel misconceptions about the independence of scientists collaborating with industry.

Academic incentives: Attendees discussed whether the right incentives are in place to encourage researchers to work in industry. They noted that the risks involved in a move from academia to industry are perceived to be high, in part because academic institutions tend not to value the types of achievements made by researchers working in industry. Opportunities to build academic credentials – for example, publications and grant applications – were also seen to be low in industry, potentially making re-entry into academia difficult. It was suggested that there is a need to mitigate such real or perceived risks at a national level to incentivise the free movement of personnel between the sectors. One solution might be to provide young postdoctoral researchers with access to their own funding, which they can take with them to various companies and academic institutions. It was also suggested that research funders might explicitly require grant holders to consider how their basic science discoveries may be translated into products to benefit society, encouraging a more translational mindset.

Research Excellence Framework (REF): Attendees discussed the potential for REF to be used as a lever for cultural and behavioural change. They noted that funding councils need to be made aware of the benefits of business-university collaborations to ensure that national assessment procedures such as the REF continue to recognise and suitably reward such behaviour. Attendees agreed that the inclusion of the impact element within REF is an important step forward, but does not go far enough in encouraging 'team science'. The need for universities and research institutes to ensure that their recruitment policies and promotion criteria also incentivise collaboration was noted.

Funding: The need for long-term sustained funding from government, to bridge the gap between early stage 'seed' funding for promising academic spin-outs and later stage venture capital, was highlighted. The small window of opportunity for floating companies on the UK market was also seen as a significant barrier, and one which had led to a large migration of life science SMEs to the US in recent years. It was noted that the 10 year venture capital cycle was ill-matched to the needs of the life sciences industry, but that this challenge might be surmounted if better incentives (e.g. enhanced R&D tax credits) were in place to encourage longer-term investment. It was also noted that clinical trials were easier to set up in the US, making it a more attractive base for early-stage research-intensive life science companies than the UK.

Technology Transfer Offices (TTO): Attendees expressed concern about the function and performance of TTOs, which were sometimes seen as hampering collaborations. Current incentives were seen to be problematic. It was noted that many TTOs are incentivised to achieve maximum revenue generation through securing intellectual property, rather than accelerating the translation of research for longer-term economic and social benefit. It was suggested that leaders in universities and hospitals needed to more strongly support the idea that TTOs should focus on accelerating translation and supporting collaboration rather than securing short-term returns. Cancer Research Technology, which commercialises new discoveries in cancer research through business-university collaborations, was offered as a notable example of an efficient TTO that gets deals done speedily with minimum bureaucracy. Attendees also highlighted that TTOs are often not adequately funded. It was suggested that government should make a long-term commitment to increase funding streams such as the Higher Education Innovation Fund and the Knowledge Transfer Grant, to ensure that TTOs are better supported and therefore less driven by short-term revenue generation.

Education: It was felt that academics and clinicians often have a poor understanding of processes related to drug development and commercialisation; for example, subjects such as product development, patent law, deal structures, intellectual property valuation and project management. Hence, there was felt to be a need for experienced business engagement teams to improve the provision of business education amongst university students and academics. This is difficult given the small number of 'bridge crossers', with experience of working in industry, currently working in academia. The need for universities in the UK to be more entrepreneurial was also pointed out. Massachusetts Institute of Technology (MIT) in Boston was offered as an example where entrepreneurship is encouraged at all levels and has resulted in significant innovation.

Open innovation: It was highlighted that the pharmaceutical industry has historically required strong patent coverage to justify the large investments it has made. However, models of drug development are changing and the industry is increasingly reaching out to academics and sharing its data and assets in the hopes of creating knowledge, discovering new molecules and pathways, and maximising return on investment. This highlights the increasing need for better academia-industry engagement. It was also recognised that open innovation can reduce the cost of failure by avoiding duplication of effort and 'de-risking' potential products before industry takes over later phases of development. It was noted that opportunities for open innovation extend beyond small molecules and biologics and include diagnostics and preventative measures. The

Structural Genomics Consortium was highlighted as a good example of open innovation operating across a public-private partnership.²

It was noted that the increasing costs of large randomised controlled trials and advances in personalised medicine warrant the need for more flexible approaches to regulation and licensing (for example, adaptive licensing). This was seen to be fundamental to driving future innovation. However, it remains uncertain whether this will translate to lower prices for new treatments and it was suggested that, if not, continued innovation in the sector would become unsustainable. Resolving questions about how such treatments should be reimbursed was considered critical. Academic research in areas such as trial design, social sciences and health economics will be essential and require a good understanding between academia and industry.

The role of the NHS: In medical sciences the relationship between academia (e.g. clinical academics) and industry also includes the NHS. Attendees stressed the need to make the NHS a more attractive place to do research if the UK is to be a world-leader in translation. The creation of the National Institute for Health Research was seen as a powerful instrument for change within the NHS, and larger teaching hospitals are slowly becoming more research-aware. However, it was felt that the NHS still does not harness its full potential as a research platform, and not just a purveyor of healthcare. There was agreement that without a research-aware NHS workforce, our aspirations to achieve productive, long-term research partnerships in the life sciences will not be fully realised.

VAT: It was agreed that current VAT rules were a significant barrier to business-university and university-university collaboration because of the risk to institutions' VAT-exempt status posed by increased commercial activity. This issue has been particularly evident in the construction of the Crick Institute and the MRC Laboratory of Molecular Biology. Increased use of Gift Aid was seen as a potential solution, but this does little to encourage collaboration. It was suggested that Her Majesty's Revenue and Customs could do more to differentiate between different commercial inputs and activities.

Concluding comments:

At the end of the evening, each attendee was asked to identify a priority for action. These can be summarised as follows:

- 'Bridge-crossers', with experience in both industry and academia, play a crucial role in seeding collaboration and breaking down the cultural barriers that can preclude it. More opportunities, incentives and rewards are needed to increase the flow of researchers between industry and academia.
- Academics of all levels, from undergraduate upwards, should be taught more about innovation, entrepreneurship and the commercial aspects of research.
- Universities should seek to build a culture that encourages and rewards entrepreneurial behaviour and this should be reflected in the work of technology transfer offices, which need to be better supported and more consistent in the quality of their work.

² Several other examples were discussed in our 2014 FORUM meeting on 'Open Innovation in the NHS'. <http://www.acmedsci.ac.uk/more/events/open-innovation-in-the-nhs/>

- More should be done to provide a sustainable source of funding to early-stage life science companies. Inward investment to the sector should be incentivised and there should be consistency in the instruments used to do this. A more stable innovation system is needed.
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The Academy of Medical Sciences

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Annex I: Attendees at the dinner with Dame Ann Dowling

Professor Jeffery Almond FMedSci - Vice President, Research and External R&D, Sanofi Pasteur (formerly)

Ms Victoria Charlton - Head of Policy, Academy of Medical Sciences

Sir David Cooksey GBE FMedSci – Chairman, Francis Crick Institute

Dame Ann Dowling DBE FEng FRS - President, Royal Academy of Engineering

Professor Pete Downes OBE FRSE FMedSci – Principal and Vice Chancellor, University of Dundee

Dr Mehwaesh Islam - Policy Officer, Academy of Medical Sciences

Professor Peter Johnson FMedSci - Professor of Medical Oncology, University of Southampton

Dr Melanie Lee CBE FMedSci – Chief Scientific Officer, BTGplc

Dr Ruth McKernan CBE – Senior Vice President, Pfizer

Ms Jessica Montgomery - Policy Advisor, Royal Academy of Engineering

Dr Menelas Pangalos - Executive Vice President of Innovative Medicines & Early Development Biotech Unit, AstraZeneca

Dr Rachel Quinn - Director of Policy, Academy of Medical Sciences

Professor Caroline Savage FMedSci - Vice President and Head, Experimental Medicine Unit, GSK

Dr Hayaatun Sillem - Director, Programmes and Fellowship, Royal Academy of Engineering

Professor Peter Weissberg FMedSci - Medical Director, British Heart Foundation

Professor Paul Workman FMedSci - Chief Executive and President, The Institute of Cancer Research