

Enriching research, training scientists:

Results of the ABPI 2011 survey of partnership
working between the pharmaceutical industry
and the university sector



UK research: a sought-after endeavour

The past 60 years have seen a revolution in our understanding of many diseases and their treatments. During this time, there has been a revolution in the number, specificity and safety of human medicines. The UK has played an important role in this process, and is recognised as a leader in medical research, with a proven record of high ethical standards and valuable skills in innovation.

Many European-, Japanese- and American-owned pharmaceutical companies fund major research groups in the UK, and research carried out in British laboratories and clinics lies at the heart of many of today's major medicines. About a fifth of the top 100 medicines in use today originated from research in this country – a record second only to that of the United States. Companies continue to invest in the UK and support the training of scientists to discover, develop and manufacture the medicines for the future.

It takes a long time to develop a new medicine – around 12.5 years – and it typically costs £1.15 billion to do all the work necessary before a new medicine can be licensed for use¹. The majority of medicines under development never make it to the market; following thorough studies, they may be found to have unacceptable side effects, or they do not work any better than existing treatments. The industry invested £4.6 billion in UK research and development in 2010 and employs more than 67,000 people, including 25,000 in research and development roles.

The pharmaceutical industry carries out substantially more research than any other industry sector in the UK, bringing major health benefits to patients in Britain and all over the world.

A partnership-driven drug development model

The conventional pathway of drug development has been successful for many years and is still a viable model / framework to develop medicines for certain diseases. Alongside this huge increase in the cost of drug development there has been a concomitant drop off in the number of new medicines being approved year on year. This is due to a number of reasons, including that in some disease areas, the underlying complexity of the disease, involving both genetic susceptibility and environmental factors, can lead to difficulties in identifying the sub-group of patients who are most likely to benefit from a particular therapeutic approach. In some disease areas, no single pharmaceutical company or academic group can provide all the resources, expertise and knowledge to develop new therapies.

Alternatives to the conventional drug development process are increasingly being explored, and it is recognised that strong partnerships between industry, academia, the NHS and regulators must be fostered in order to achieve a reduction in the time it takes to develop new medicines for patients.

Pre-competitive or non-competitive research, for example in areas such as predictive toxicology, drug target identification and validation, and the identification of novel biomarkers, is increasingly being carried out through partnerships including pharmaceutical companies, academic institutions, research councils and charities. As well as supporting the discovery of new medicines these partnerships enrich academic research and support high level knowledge exchange between industry and academia. Many have been supported through several phases and involve several pharmaceutical companies and more than one university.

¹Paul S et al. 'How to improve R&D productivity: the pharmaceutical industry's grand challenge.' Nature Reviews Drug Discovery, 9, 203-214 (March 2010)

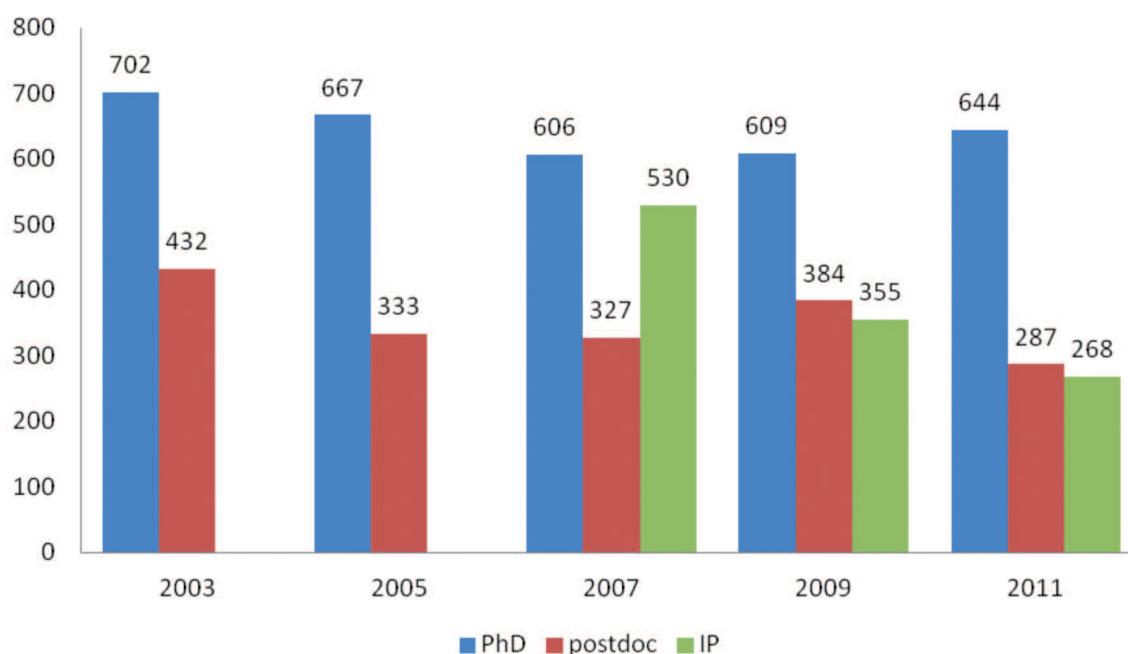
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The Division of Signal Transduction Therapy at Dundee, supported by the MRC and five pharmaceutical companies, is in its fourteenth year and is soon to be funded for a further 4 years. Phase III of the Structural Genomics Consortium is funded by seven pharmaceutical companies and the Wellcome Trust. New partnerships created in 2010 and 2011 include the Manchester Inflammation Centre, funded by GSK and AstraZeneca; the MRC/AstraZeneca compound library; and a number of 'Discovery Partnerships with Academia' agreements between GSK and a range of academic institutions.

Industrial Placements: proposals to meet the demand

However, as partnerships and outsourcing of research and development have increased, the in-house capacity of many pharmaceutical companies has decreased, leading to some sites closing and fewer scientists being employed at others. These changes have impacted on the capacity of companies based in the UK to support undergraduate, postgraduate and postdoctoral training.

Figure 1: Overview of industry-academic partnerships



Our survey has found that undergraduate industrial placements have dropped sharply – from 530 in 2007 to 268 in 2011. Placements are normally of one year's duration, and require intensive supervision at first, so capacity to take students will be rapidly affected by any change to the number of scientists employed.

Industrial placements are highly valued as training for a research career in both industry and academia and students appreciate the opportunity to experience research in an industrial laboratory; hence the decrease in placements offered by pharmaceutical companies is a concern. It is hoped that smaller companies and contract research organisations (CROs) will increase the number of placements they offer to partly offset the decline in placements from large companies.

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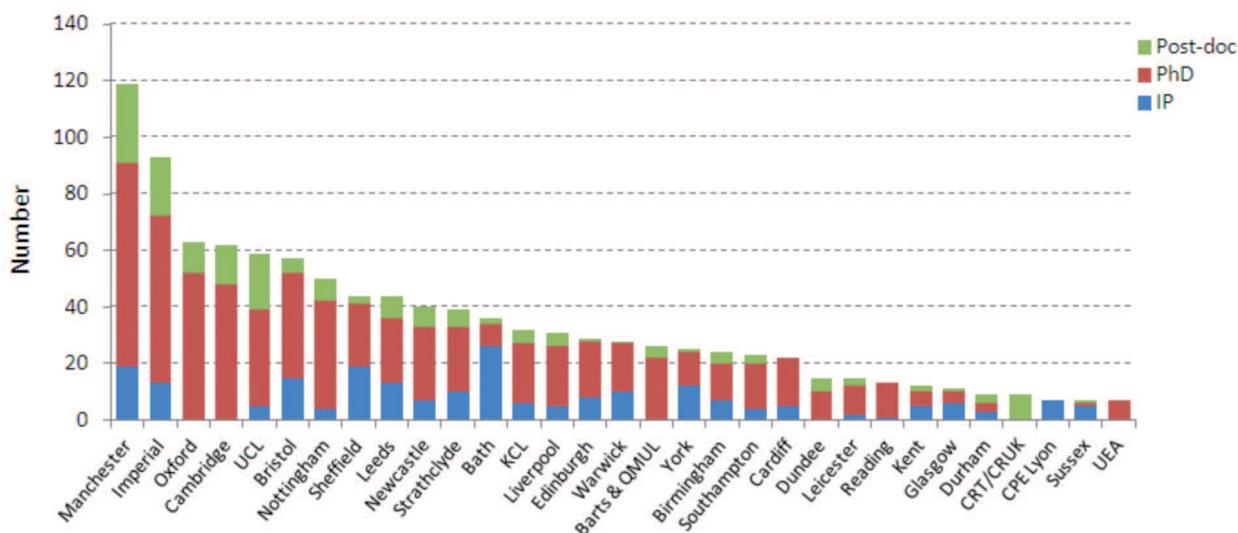
The recently-published *Wilson Review of Business-University Collaboration*² recommends measures to encourage students to take up placements and companies to offer them. These recommendations are welcomed and we hope that the changes suggested will be implemented. Other bodies, including the Cogent Sector Skills Council and the Royal Society of Chemistry, share these concerns and are proposing actions to encourage more companies to offer placements.

Industry support of postgraduate training

Postgraduate training continues to be strongly supported by pharmaceutical companies. The apparent increase in the number of studentships supported by the industry at the end of 2011 results from an increase in the duration for which a student is funded, with 65 per cent of studentships now being funded for four, rather than three, years. Hence, while there has not been a real increase in the numbers of PhD students funded by industry, there has been an increase in the level of support for PhD training. Research Councils also provide substantial support for studentships; companies identified the Biotechnology and Biological Sciences Research Council (BBSRC) as the funding partner for 32 per cent, the Engineering and Physical Sciences Research Council (EPSRC) for 20 per cent, and the Medical Research Council (MRC) for 11 per cent of studentships.

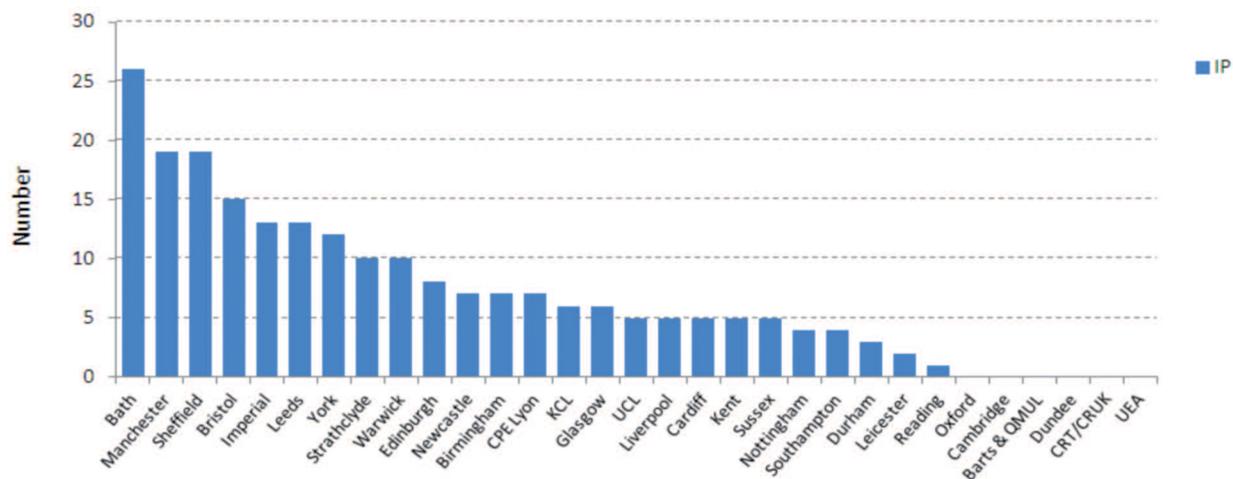
The type of collaboration between pharmaceutical companies and academic institutions varies: some focus purely on research collaborations, whilst others strongly value opportunities for undergraduates to experience research in industry. There is a core group of research-intensive universities that understand the benefit and value of training the future researchers for the pharmaceutical industry.

Figure 3: Overview of industry-academic partnerships



²Review of Business-University Collaboration (The Wilson Review). <http://www.wilsonreview.co.uk/review/>

Figure 4: University industrial placement partners



Conclusion

The achievements of the UK in the development of drugs and the training of scientists are recognised worldwide. However, industry and the university sector need to work together to ensure that this level of achievement continues within a more challenging climate. The ongoing investment in the UK by pharmaceutical companies indicates the value attached to UK academic training. A new drug development model, driven by partnerships between large and small companies, and emphasising the two-way knowledge exchange between industry and academia, shows the potential for the continuing enrichment of research in universities.

The 2011 ABPI survey provides an overview of industry-academic partnerships in the UK over the last decade, and identifies the universities that are currently most involved in collaborations with pharmaceutical companies. The examples discussed above represent ways of enhancing partnerships between industry and the university sector in the immediate future, including ensuring funding for postgraduate research and increasing the availability and uptake of Industrial Placements.

Association of the British Pharmaceutical Industry
7th Floor, Southside, 105 Victoria Street, London SW1E 6QT
t +44 (0)870 890 4333 abpi@abpi.org.uk