abpi

Bringing medicines to *life*

Developing talent and partnerships to create new medicines

September 2016

Acknowledgements

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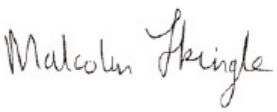
Foreword

Every two years the Association of the British Pharmaceutical Industry (ABPI) carries out research in the form of a survey to identify collaboration and other links between industry and academia. These links can range from interactions with undergraduates to postdoctoral researchers, fellows and professors. This report presents results from the 2015 survey and comparisons with data gathered since 2003, when the survey was established.

Notable in this survey is that the number of apprentices being trained by pharmaceutical companies has more than doubled; this is due, in part, to life science companies working together through the Science Industry Partnership (SIP) to ensure that appropriate apprenticeship standards are developed and that high-quality training is available for these young people.

The report also highlights some of the UK pharmaceutical industry's current significant and innovative collaborative projects with academia, charities, the NHS and the European Union (EU). These include long-term research collaborations between multiple pharmaceutical companies and other partners with a university, and innovative training opportunities for young people, such as the GlaxoSmithKline Doctoral Training Centre which was set up in 2011 in partnership with Strathclyde University to provide studentships for graduate chemists to complete a research-based PhD at GSK.

There is also an increasing trend for pharmaceutical companies to open up their compound libraries and other proprietary resources to collaborating academics. This could lead to repurposing of molecules for different indications and to improved validation of therapeutic targets.



Executive summary

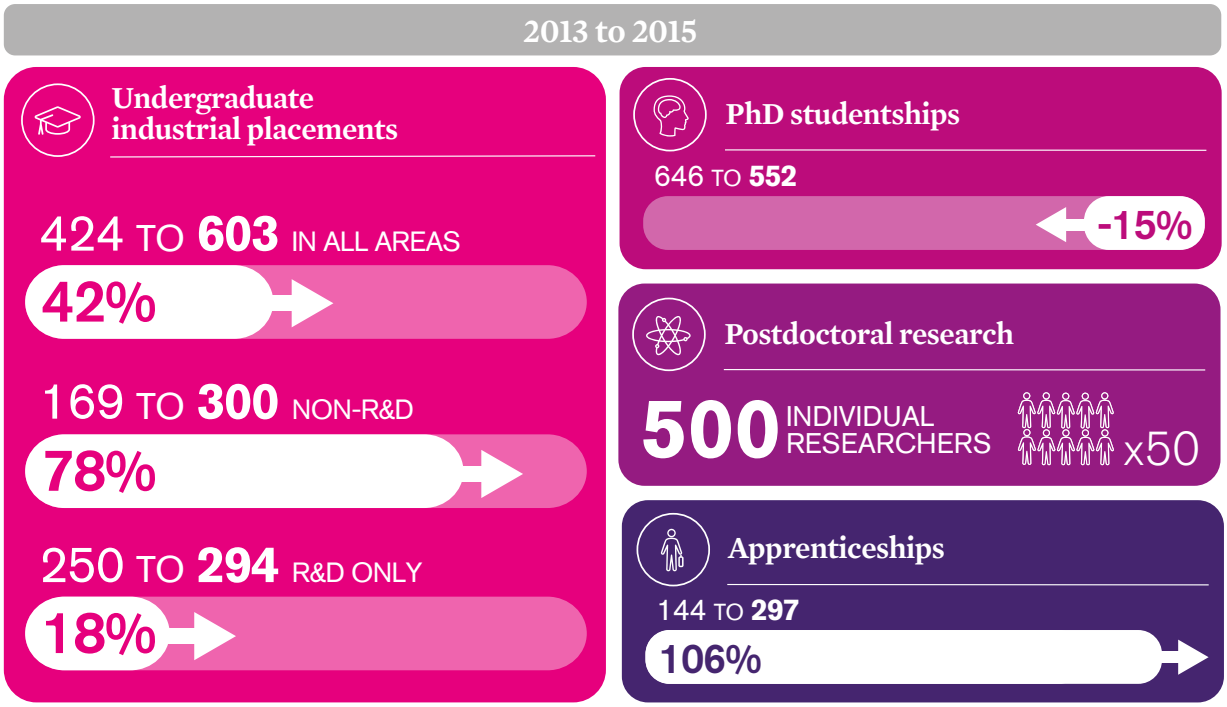
In the two years since the last survey there have been increases in the number of training opportunities for young people in pharmaceutical companies. This includes a huge increase in the number of apprenticeships offered in all areas and at all levels.

The increase in undergraduate industrial placements in research and development (from a low of 250 in 2013) is encouraging, as is the substantial growth in the provision of placements in manufacturing and in other business areas. ABPI's 2015 report *Bridging the skills gap in the biopharmaceutical industry*[1] suggested that industry could help equip graduates with the skills they need to succeed in the workplace through providing more placements for undergraduates.

The number of PhDs supported by industry is at its lowest level since 2003. This is not unexpected as the supervisory capacity within UK pharmaceutical companies has decreased as companies have closed or downsized research and development sites. There are concerns, however, that the move towards Research Councils funding PhDs through doctoral training centres makes it more difficult for companies to closely engage with students. The University of Strathclyde has the highest number of PhD students in partnership with industry. The 75 sponsored PhDs with Strathclyde is around twice the number based at the next highest-ranked institutions, UCL, Manchester and Cambridge.

A number of large-scale collaborations are also highlighted in the report. The Dundee Division of Signal Transduction Therapy, for example, has been continuously supported by several pharmaceutical companies since it was created in 1998. Other examples of innovative partnerships focus on a specific disease area, or aim to address cross-industry concerns, such as validation of therapeutic targets for medicines. The number of major collaborative projects and initiatives is increasing as industry shifts towards long-term open partnerships with academia, charities and other funders.

The key figures from this survey are:



Results of the ABPI industry-academic links survey 2015

The UK pharmaceutical industry is world class in fostering successful partnerships with academia, ranking fourth in the world for research and development (R&D) collaborations.[2] Positioned at the leading edge of drug development and spending billions on R&D each year alone, the pharmaceutical industry is a major, research-intensive contributor to the UK economy, despite three consecutive years of decreases in R&D expenditure.[3]

Since 2003, the Association of the British Pharmaceutical Industry (ABPI) has gathered information biennially from member companies on their links with academia, from individual undergraduate placements to significant collaborations involving multiple companies and institutions. This year the survey continues to measure the extent of such links and identify trends within a thriving industry sector.

The nature of collaborations between industry and academia extends across many disciplines, as exemplified by the variety of links that the 2015 survey has captured, covering both R&D and non-R&D business areas.

Why collaborate?

The case for teaming up in the UK is very strong. The Dowling Review of Business-University Research Collaborations, published in July 2015, provides a comprehensive overview of the current state of UK R&D collaborations. Fourteen out of the top 40 companies cited, based on the number of collaborative projects with academia, are in the pharmaceutical industry; seven of these are within the top 15.[4] These projects allow ideas and expertise to flow between industry and academia, resulting in a whole array of benefits for those involved.

For companies, benefits can include more efficient and successful drug development, greater networking, access to talented graduates, reduced risk associated with investing in innovative research, and the potential for increased gross value added (GVA) per pound spent. For academics, these include access to specialist equipment and data, a greater understanding of real-world problems and industrial challenges, increased job prospects, and new funding avenues.

The Research Excellence Framework (REF) in 2014 provided a way to measure the quality of research at UK universities and the impact created by industry-academic collaborations, illustrating what can be achieved when collaboration is successful. Movement between academia and industry is key to enabling interactions, both short- and long-term, that have the potential to grow into successful collaborations. The ABPI industry-academic links survey captures some of these interactions and how they are changing as the landscape becomes more truly open and innovative.

Partnerships are providing a multitude of opportunities across different career stages

The UK pharmaceutical industry continues to provide industrial training and experience to undergraduates, graduates, postgraduates and postdoctoral researchers by offering placements, funding and support for a variety of research projects either at their own R&D sites or within an academic environment.

Industry-academic R&D trends

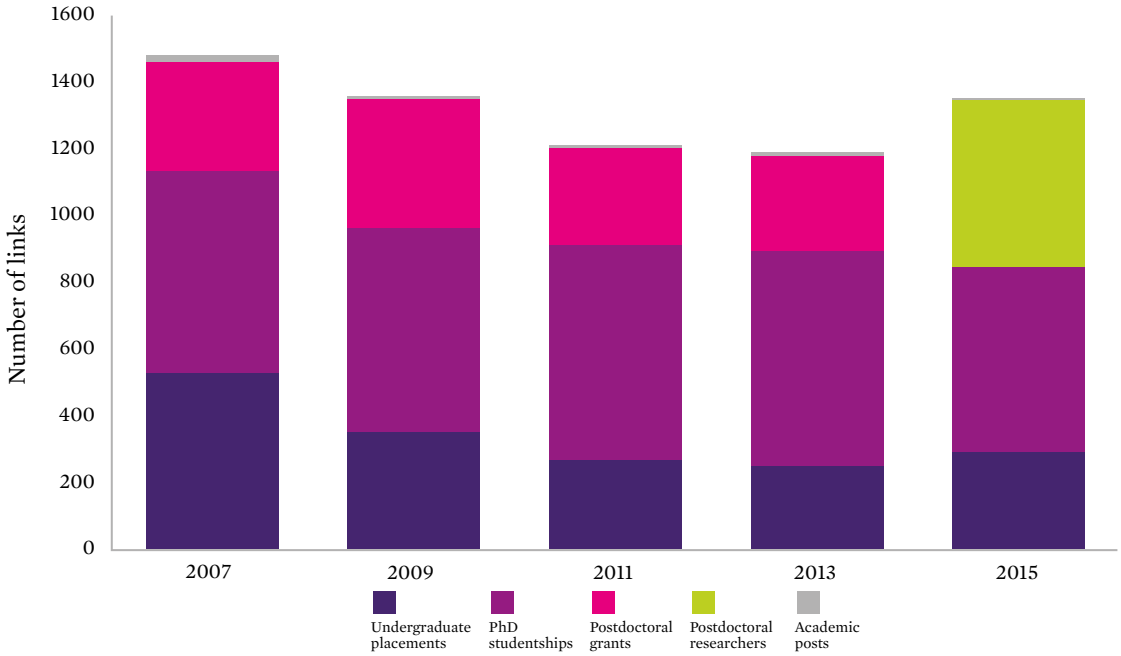


Figure 1. Trends in the number of research and development undergraduate industrial placements (IPs), PhD studentships, postdoctoral collaborations and academic posts from 2007 to 2015.

NOTE: Up until 2015, members were asked to provide the number of postdoctoral grants held (pink); in 2015 the number of individual postdoctoral researchers was sought (green). Academic posts include visiting professors and fellows.

COMMENTS: Undergraduate IPs in R&D areas dropped by more than 50% over a six-year period, from 530 in 2007 to 250 in 2013, but have risen by about 18% in 2015. In 2011 there was an apparent increase in PhD studentships supported by industry which was attributed to a shift in funding from three to four years. This year the number of PhDs recorded has dropped by nearly 100. The sharp increase in postdoctoral collaborations recorded this year was expected because of the change to the way in which this data is recorded.

From 2013 onwards companies were asked about *all* of their undergraduate industrial placements (IPs), including those outside R&D. In 2015, 603 placements in sixteen different business areas were recorded; just under half in R&D. Over 97% of these were one year in duration, the rest were two–three months.

Undergraduate IPs

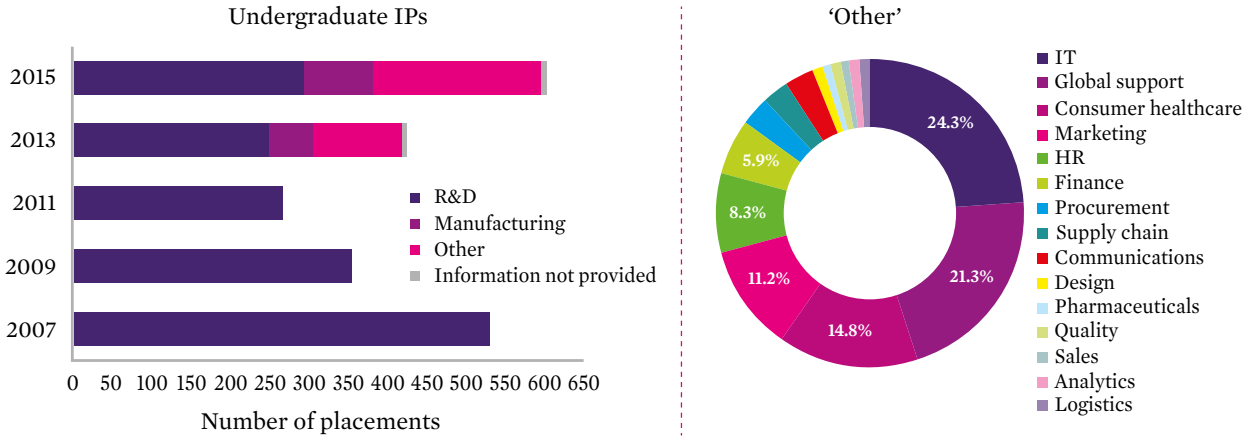


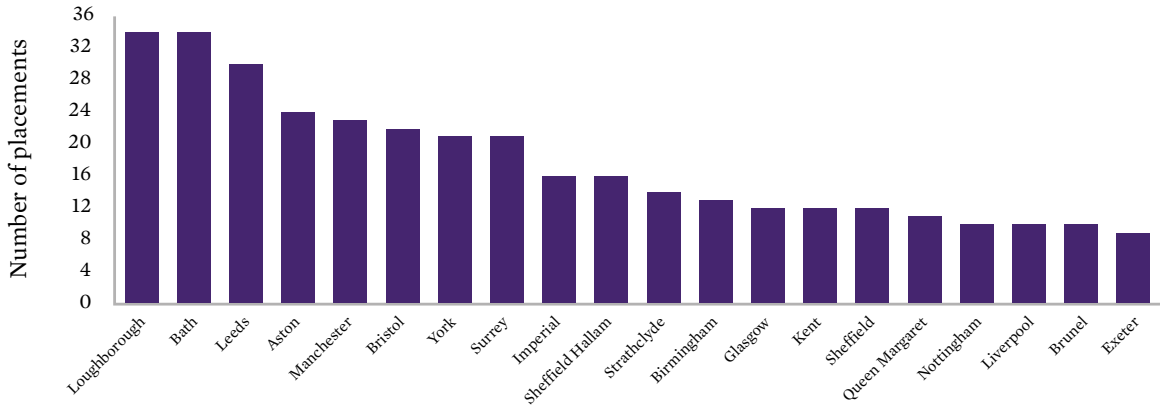
Figure 2. Trends in the number of undergraduate IPs, separated into business area, from 2007 to 2015. The pie chart shows the breakdown of the 2015 'Other' category.

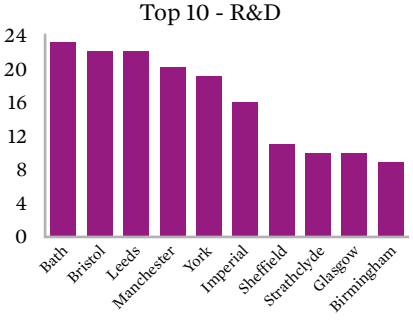
NOTE: No data was collected on non-R&D placements before 2013.

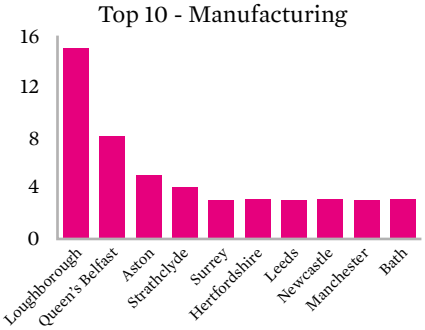
COMMENTS: The number of non-R&D undergraduate IPs (manufacturing and other) recorded has risen from 169 in 2013 to 301 in 2015: a 78% increase. Nearly a quarter of 'Other' IPs are in Information Technology (IT).

Companies were also asked which universities their placement students were registered at; Loughborough, Bath and Leeds were top in 2015. However, as 49% of placements were R&D, 14% manufacturing and 35% 'other', the data is also shown separated into these different categories. The top three universities for undergraduates acquiring R&D placements were Bath, Bristol and Leeds, whereas Loughborough was the most successful for students obtaining placements in manufacturing.

Top 20 UK academic institutions for all undergraduate IPs







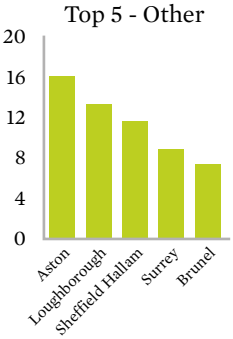


Figure 3. Top UK academic institutions with undergraduate students successfully obtaining IPs in all areas, R&D, manufacturing and 'other' in 2015.

COMMENTS: Aston and Surrey have moved up significantly since 2013, from 9th (12 placements in total) to 4th (24) and 24th (6) to 8th (21) respectively, as their students secured placements across all business areas. Imperial, Strathclyde and Birmingham have also moved up this year and are now within the top 10 for R&D placements.

There has been quite a dramatic change in the top 20 institutions for undergraduate IPs, with only 13 of the top 20 from 2013 still listed – a change is likely to have resulted from the increase in non-R&D placements recorded here. See the appendices for data on academic institutions from 2013.

What about graduates?

Some companies are hosting short graduate placements in addition to their graduate schemes/jobs and collaborative PhD programmes. Shorter placements are often part of an Erasmus programme or MSc degree and are typically less than one year in duration. Longer programmes, lasting around 2–3 years, are also offered by companies. Examples include AstraZeneca's Innovative Medicines and Early Development (IMED) graduate programme and GlaxoSmithKline (GSK)'s Future Leaders programmes.

For those who wish to pursue a doctoral degree there are various collaborative PhD opportunities with industry. The PhDs recorded in 2015 account for around 40% of all R&D industry-academic links (not including graduate schemes/placements) despite a decrease in the total number of PhDs, from 646 in 2013 to 552 in 2015.

PhD studentships

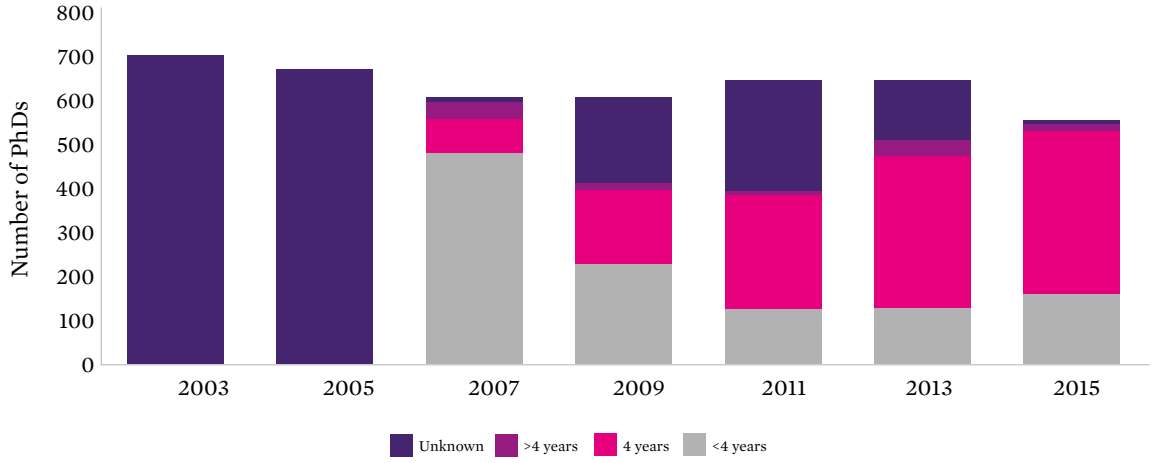


Figure 4. Trends in the number of PhD studentships separated into duration from 2007 to 2015.

NOTE: In 2003 and 2005 duration details were not requested.

COMMENTS: The total number of PhDs for each year were: 702 in 2003; 667, 2005; 606, 2007; 609, 2009; 644, 2011; 646, 2013; and 552, 2015. The number of PhDs recorded in 2015 has dropped by about 15% in the last two years, a figure that is at its lowest since the ABPI survey began in 2003. There is a trend towards 4-year funded PhDs rather than 3–3.5 years.

In future surveys it would be beneficial to gather information on the length of time each PhD student spends within an industrial setting, and the extent of their interactions with industrial scientists, in an attempt to measure potential impact.

Given the decline in the number of PhDs recorded here, it is important to recognise how collaborative PhDs are funded. Companies were asked to provide information on funding partners (funders in addition to the companies themselves). Just over a third are co-funded with the Biotechnology and Biological Sciences Research Council (BBSRC) and around a quarter with the Engineering and Physical Sciences Research Council (EPSRC). Whilst the number of PhDs co-funded with the BBSRC and EPSRC has both stayed relatively stable in comparison with previous surveys, the pharmaceutical companies surveyed reported

fewer co-funded PhDs with the Medical Research Council (MRC), from 63 in 2011 to 33 in 2013 and to 19 in 2015. However, CASE studentship award numbers by the MRC have remained relatively constant over the last six years and the MRC continues to enable partnerships for PhD students funded by other mechanisms. The reported reduction may therefore be due to an increase in successful CASE applications by SMEs and companies that are not ABPI members (and thus will not have been counted in the survey).

PhD studentship funding partners

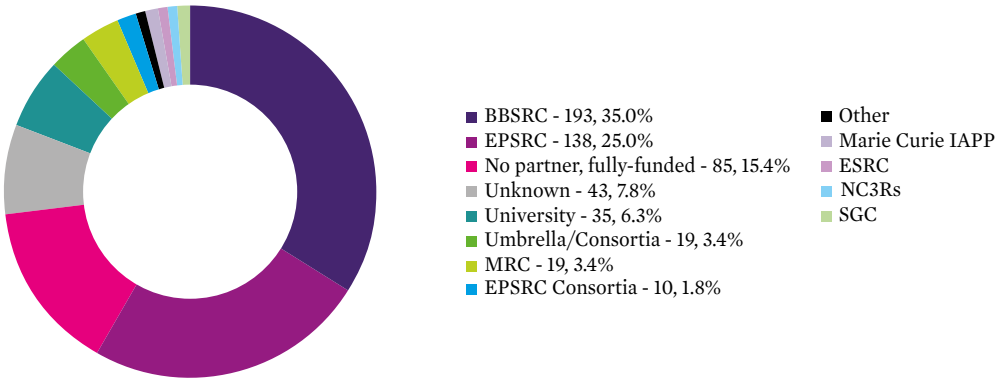


Figure 5. PhD studentship funding partners, 2015.

NOTE: Umbrella/Consortia includes umbrella agreements and consortia where partners were not listed. See the appendices for a glossary of acronyms and 2011/2013 data. Fully-funded are those funded solely by the company.

COMMENTS: The research councils are providing funding for over 65% of collaborative PhDs. Just over 15% of PhD studentships are fully funded by the company themselves.

Furthermore, there has been a change in the way Research Councils allocate funding for PhD students. Whereas in the past a company could apply for a number of CASE awards and use these to fund PhD students with specific researchers in universities, a higher proportion of funding is now allocated by EPSRC and BBSRC to university departments. PhD students at these doctoral training centres may be less attractive to the company as the company has less influence over the research being carried out and the students are often less closely associated with the supporting company. This may explain part of the decline in the total number of PhDs recorded in 2015.

Despite this, the spread of studentships across UK academic institutions remains similar, as 17 of the top 20 institutions are also among those listed in the previous survey. The University of Strathclyde is top for collaborative PhD studentships in 2015 with 75, partly due to the GSK-Strathclyde collaborative PhD programme (established in 2011) which is accountable for many of these.

Top 20 UK academic institutions for PhD studentships

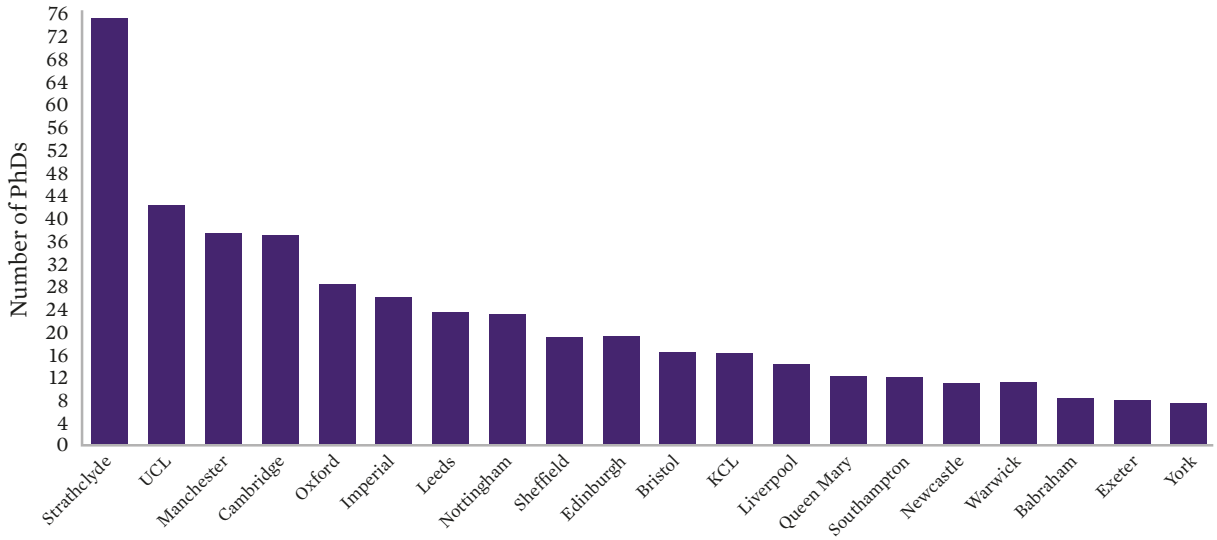


Figure 6. Top 20 UK academic institutions for collaborative PhDs in 2015.

COMMENTS: Strathclyde has moved up from 4th (total 39) to 1st (75) place since 2013. The Babraham Institute*, Exeter and York are in the top 20 for the first time, taking 18th, 19th, and 20th place respectively.

* The Babraham Institute receives funding from the BBSRC, and PhDs are awarded through the University of Cambridge. See the appendices for the top 20 academic institutions in 2013.

The UK pharmaceutical industry also supports a small number of PhD studentships overseas, accounting for around 2% of PhDs in 2015 – 12 in total.

Contrastingly, 56% (280) of the 500 postdoctoral researchers captured here are based outside the UK, making up the largest proportion of overseas industry-academia links in all surveys to date. The length of time postdoctoral researchers spend collaborating with industry varies from less than one year to more than five years and 35% are at academic institutions in the USA. It should be noted that data on postdoctoral researchers was reported from a UK point of view and it is very likely that many outside the UK were missed, such as those involved in the Innovative Medicines Initiative (IMI) – Europe's largest private-public collaborative initiative.

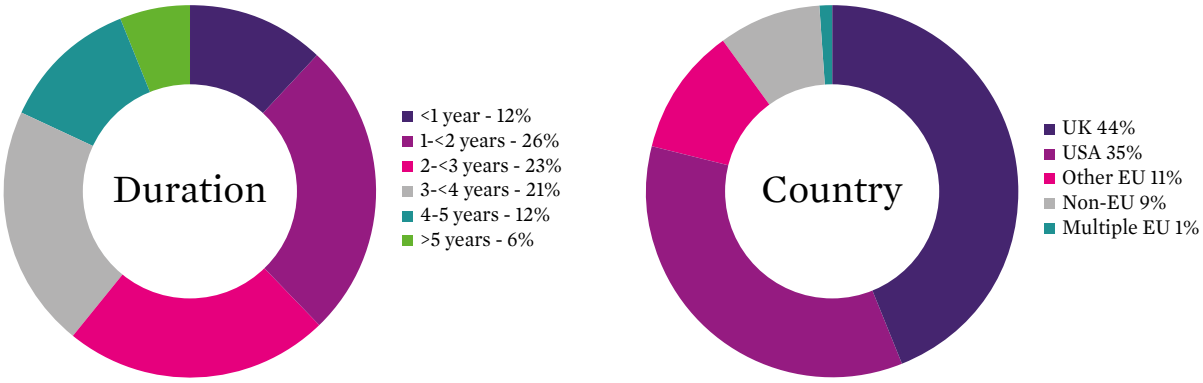


Figure 7. Duration and location of postdoctoral researchers collaborating with the UK pharmaceutical industry, 2015.

COMMENTS: Postdoctoral researchers based at UK academic institutions make up 44% of those recorded in 2015. See the appendices for a full list of countries included within 'Other EU' and 'Non-EU'.

The overall top academic institution for industry links (R&D and non-R&D) in 2015 is the University of Strathclyde, mostly due to the high number of collaborative PhDs. Second is University College London which has the largest number of postdoctoral researchers spending time with industry, and third is the University of Manchester with a broad mix of links across all career stages.

Overall top 20 academic institutions

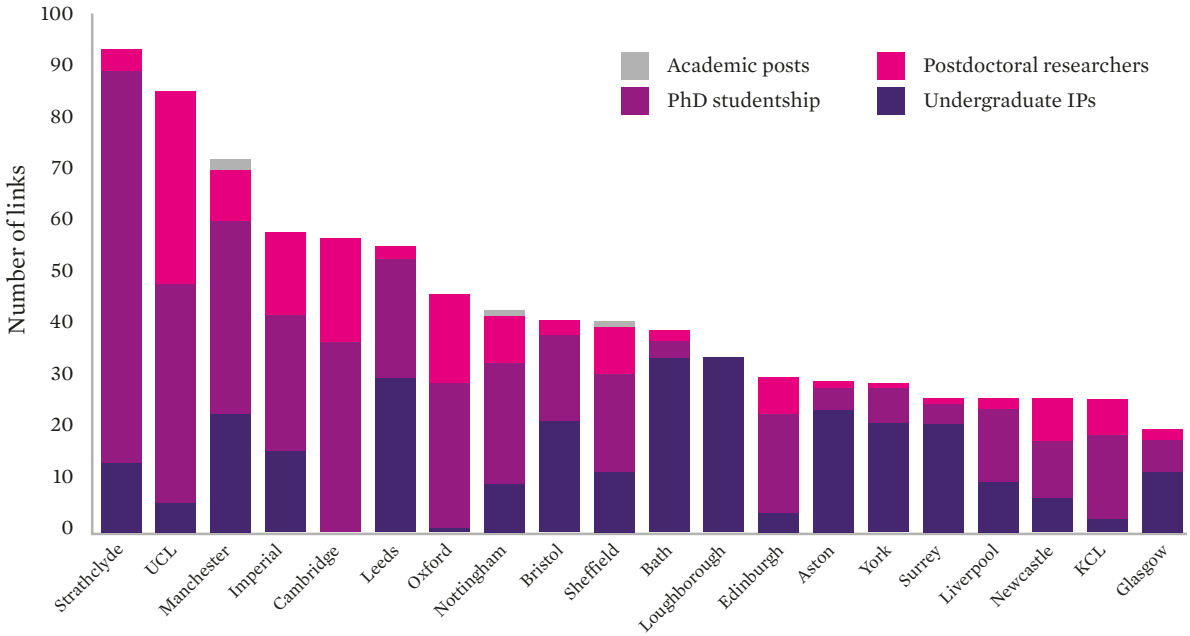


Figure 8. Overall top 20 UK academic institutions for industry links in 2015. The chart shows the variety of types of link each university has with pharmaceutical companies.

COMMENTS: Loughborough is 12th solely because of their students obtaining undergraduate IPs, and Cambridge 5th because of the numbers of PhD students and postdoctoral researchers collaborating with industry.

Other training routes

Aside from the 'traditional' R&D career path from undergraduate student to postdoctoral researcher and beyond, there is a growing emphasis on apprenticeships in the UK which is in part due to the Science Industry Partnership (SIP).[5] 2015 has seen a 106% increase in the number of apprentices being trained within the UK pharmaceutical industry, from 144 to 297; 10% (30/297) of which are in R&D – up from 8% (11/144) in 2013. The proportion of manufacturing apprenticeships has also gone up from 20% (29/144) to 31% (92/297).

Apprenticeships

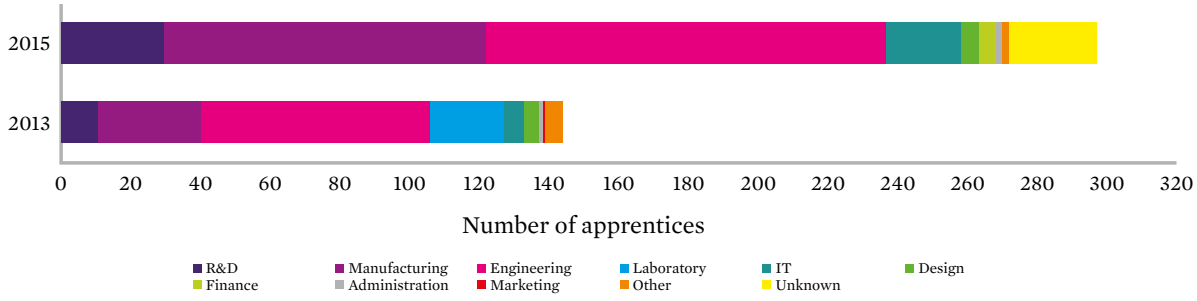


Figure 9. Trends in the number of apprentices separated into business area in 2015 vs. 2013.

NOTE: No data was collected on apprenticeships before 2013. 'Manufacturing' includes apprentices in production, quality and supply chain.

COMMENTS: The total numbers of apprentices for each year were 144 in 2013 and 297 in 2015. Apprenticeships in R&D, manufacturing, engineering and IT account for a larger percentage of total apprentices in 2015 compared to 2013, suggesting that there is a greater emphasis on apprentice training in these business areas.

The 2015 survey has seen a huge rise in the number of companies providing training for apprentices as more than twice as many companies reported having apprentices than in 2013. The majority of these, about 70%, are advanced-level apprenticeships (level 3) which are equivalent to two A levels but over a quarter are high-level (level 4+) with some working towards foundation and honours degrees. Although the spread of apprenticeships across the different levels has barely changed since 2013, companies are recognising how high-level apprenticeships can contribute to their businesses. It is expected that this figure will continue to increase in years to come.

Level of apprenticeship vs. business area

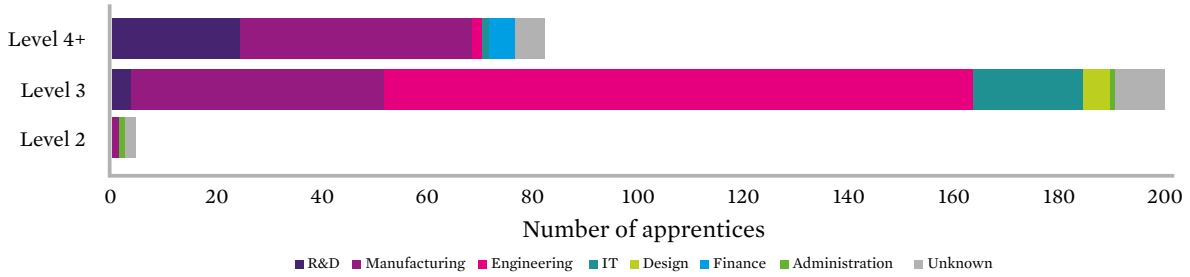


Figure 10. Level of apprenticeships in 2015 separated into business area.

COMMENTS: Level 2 apprenticeships account for just under 2% (5) of apprentices. Level 3 accounts for about 70% (208) with 48 of these in engineering and 112 in manufacturing, making up the largest two business areas. The majority of R&D apprenticeships are level 4+.

Whilst the level of apprenticeships remains virtually the same, there does appear to be a shift towards three-year-long apprenticeships, with 48% (142) of those recorded in 2015 expected to last for three years, a figure that is up from 7% (10) in 2013, where data was provided. It will be interesting to see how apprenticeships within the UK pharmaceutical industry develop in the future and whether there will be a rise in the number of high-level apprentices working towards degree-level qualifications.

Duration of apprentices in 2013 vs. 2015

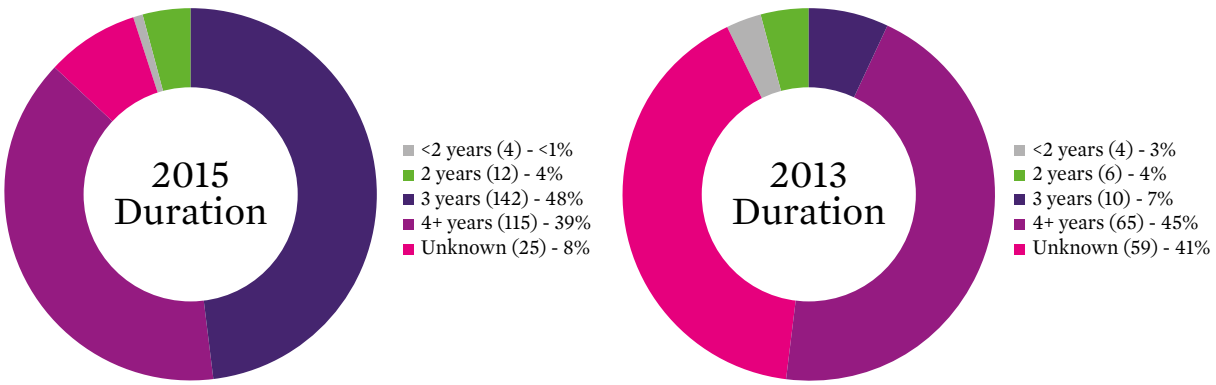


Figure 11. Duration of apprentices in 2013 vs. 2015.

COMMENTS: In 2015, the majority (87%) of apprenticeships are three years or longer in duration; fewer than 5% are two years or shorter. The 2013 survey had a high percentage of unknown duration (41%); however, at least 52% were three years or more in duration.

Finally, since 2007 and 2011 respectively, the survey has collected information on the number of pharmacy pre-registration placements and F1/F2 medical training posts that ABPI members have hosted, and which universities the students graduated from. In 2015, 13 pharmacy pre-registration placements and no F1/F2 medical training posts were recorded.

Significant collaborations

Collaborations arise in many ways and can be: between one company and one institution; one company and multiple institutions; one institution and multiple companies; and can receive support from Research Councils, charities, the NHS and the EU. The number of major collaborative projects and initiatives is rapidly growing as industry shifts towards long-term open partnerships, with each partner contributing and sharing their expertise to ensure pioneering, innovative research in the UK.

*The longest collaboration to date is **The Division of Signal Transduction Therapy** in Dundee, created in 1998, that continues to provide industrial experience to hundreds of academics whilst accelerating the development of drugs to treat global diseases.*

Since the DSTT was established, many more partnerships of all sizes have sprung up across the UK. In 2008, Lilly created the **Centre for Cognitive Neuroscience** (CCN) in Surrey to bring together researchers from six UK universities in a mission to improve success in targeting diseases such as Alzheimer's. Since 2010, the **MRC-ABPI Immunity and Inflammation Initiative**, which started with three consortia, has helped shape the **MRC's Stratified Medicine Initiative** that now consists of 13 consortia and includes 32 academic partners, three charities, and over 50 SMEs from around the world. Furthermore, many UK pharmaceutical companies are providing funding towards the **Innovative Medicines Initiative** (IMI), Europe's biggest collaborative initiative, with more than 50 projects aimed at speeding up drug development and enhancing clinical success. One example is the **ORBITO** (oral biopharmaceutics tools) project with 25 partners including 11 UK pharmaceutical companies, aimed at improving knowledge of oral drug uptake into the body to enhance performance predictors.

The 2015 survey has captured many of the collaborations that ABPI members are currently involved in and highlights the way in which industry-academic collaborations are evolving. The selected examples below show their diversity. Whilst some focus on a particular disease or research area, others take a more holistic approach to drug discovery, and then there are consortia-funded Centres for Doctoral Training (CDTs) and Doctoral Training Partnerships (DTPs) that focus on providing support and industrial training to PhD researchers.

The **Alzheimer's Research UK Dementia Consortium**, founded in 2013, supports collaborative research between pharmaceutical companies, charities, SMEs and academia. The consortium provides expertise, resources and funding for projects seeking to speed up dementia drug discovery, and in 2015 the **Dementia Discovery Fund** was set up to provide further investment in this research area.

AR-UK Dementia Consortium:
AR-UK; MRC Technology; AbbVie; Astex; Eisai; and Lilly

Dementia Discovery Fund:
UK government DoH; AR-UK; GSK; Johnson & Johnson Innovation; Lilly; Pfizer; and Takeda

The **NorthWest Centre for Advanced Drug Delivery** (NoWCADD) is a translational science centre based at the University of Manchester specialising in the development of novel nanotechnologies for cancer therapy. The centre is funded via its collaboration with AstraZeneca and is actively seeking additional partners from academia and the NHS. The University of Manchester is also home to the **Centre for Applied Pharmacokinetic Research** (CAPKR), which was set up in 1996 with multiple industry supporters, and the **Manchester Collaborative Centre for Inflammation Research** (MCCIR) involving GSK and AstraZeneca.

The **Centre for Therapeutic Target Validation** (CTTV) in Cambridge was pioneered in 2014 by three world-leading organisations: the Wellcome Trust Sanger Institute, the European Bioinformatics Institute (EMBL-EBI), Biogen and GSK. Each are sharing their proficiencies in areas such as genomics, bioinformatics, disease biology and drug discovery. The centre is committed to helping all researchers identify targets, as the data is openly available via its Target Validation Platform – an online searchable database.

Open Science

The newly fostered **GSK-Crick** open collaboration is another example of shared science, with the most important driving force being the exchange of people between the two organisations. Integrated teams of researchers will be working on early-stage research to unravel the underlying pathology of human disease which will have huge potential for boosting the development of successful, innovative treatments.

In 2015 GSK created the **Immunology Network** to enhance connections between GSK and the novel immunology research of academic scientists. Scientific leaders at GSK and an expert board of eight world-renowned academics have identified focus areas of immunology research and have selected five top academics to join them on sabbatical in the **Immunology Catalyst** starting in 2016 for up to three years. The academics will set up laboratories at GSK's R&D facility in Stevenage where they will continue their own independent research while gaining access to world-class technologies and developing a greater understanding about pharmaceutical R&D. Embedding leading academic immunologists within industry is a unique approach that will enable scientists from each organisation to collaborate effectively. Together they hope to discover the next breakthroughs in immunology that can be developed into therapies for multiple diseases.

SABS CDT:
University of Oxford; AstraZeneca; Diamond Light Source; e-Therapeutics; Evotec; GE Healthcare; GSK; Hoffmann La Roche; InhibOx; Lilly UK; MedImmune; Moffitt Cancer Centre; Novartis; Pfizer; Sharp; SGC; and UCB.

The EPSRC and MRC funded **Systems Approaches to Biomedical Science (SABS) CDT** is an innovative four-year PhD programme in which every student works in collaboration with industry. Students conduct cutting-edge research in computational and structural approaches underpinning drug and therapy discovery, data-driven drug discovery, and physiological modelling supporting drug discovery. The SABS CDT is an open collaboration between the University of Oxford and 16 partner organisations. This CDT is a good example where a simple contractual framework joins all parties while allowing each company flexibility to select and track individual students and projects, leading to a high level of industry engagement in their work.

Conclusion

The ABPI longitudinal industry-academic links survey continues to show how collaborations are changing over time. It is evident that the UK pharmaceutical industry values the benefit of collaborations through knowledge and people exchange, and is shifting towards a truly open, shared and innovative landscape to maintain the UK's position at the leading edge of pharmaceutical R&D, from fundamental research to drug discovery and development.

Many of these collaborations and other interactions between industry and academia are part of the Innovative Medicines Initiative, or other EU-funded projects. It is hoped that, in the run-up to the UK withdrawing from the EU, UK-based companies and universities will continue to be able to engage with these programmes and that the next survey, at the end of 2017, will not reveal a significant decrease in these interactions.

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5. Science Industry Partnership (SIP). See: http://scienceindustrypartnership.com/apprenticeships/

Appendices

Survey

The survey was divided into 10 sections within an Excel workbook, one for each type of academic link per worksheet, and respondents were asked to complete only those sections that were relevant to them. Data was collected on the number of academic links that were in place as of 31 December 2015 and those that started and finished during 2015, eg placements under one year in length. The survey was sent out to all ABPI full members and research affiliates and was intended to capture the number and extent of collaborations between the pharmaaceutical industry in the UK and academic institutions worldwide. This included both R&D and non-R&D placements, eg those in HR, IT, finance etc. across all company sites. For each section the following information was sought:

Section 1 – Undergraduate industrial placements
Business area (R&D, manufacturing or other), start date, duration, academic institutions where students were registered at, country.

Section 2 – Graduate industrial placements
Same as the above but including academic institutions from where students had graduated.

Section 3 – PhD studentships
Academic institutions where PhDs were taking place, country, start date, duration, funders.

Section 4 – Postdoctoral collaborations
This is the first survey where the number of postdoctoral researchers was requested, rather than the number of postdoctoral grants, in addition to start date, duration, academic institutions, country, funders.

Section 5 – Academic and honorary posts
Title of post (eg visiting professor, fellow, research clinician), business area, employer/s, start date, duration, academic institutions, country, funders.

Section 6 – Academic consultants*
Business area, start date, duration, academic institution, country.

Section 7 – Apprenticeships
Level of apprenticeship, business area, start date, duration, country.

Section 8 – Pharmacy pre-registration placements
Business area, start date, duration, academic institution from where students had graduated, country.

Section 9 – F1 F2 medical training posts
Start date, duration, country.

Section 10 – Significant collaborative projects
Companies were asked to list any significant projects involving industry/academic or industry/NHS partnership.

* Data from section 6 is not shown in this report.

Survey respondents

Pharmaceutical companies

AbbVie Limited	2013
AstraZeneca Plc (inc. MedImmune)	Data from 15 companies (10 of them the same as in 2015)
Almirall Limited	
Amgen Limited	2011
Bristol-Myers Squibb Pharmaceuticals Limited	Data from 12 companies (8 of them the same as in 2015)
Eisai Limited	
Fresenius Medical Care (UK) Limited	2009
GlaxoSmithKline Plc	Data from 9 companies (7 of them the same as in 2015)
Janssen	
Lilly (Eli Lilly and Company Limited)	2007
Lundbeck Limited	Data from 10 companies (7 of them the same as in 2015)
Merck Sharp & Dohme Limited	
Napp Pharmaceuticals Limited	2005
Pfizer Limited	Data from 13 companies (7 of them the same as in 2015)
Takeda UK Limited	
	2003
	Data from 14 companies (7 of them the same as in 2015)

Contract Research Organisations (CROs)

Envigo
Quintiles
Sequani Ltd

Data analysis methodology

Microsoft Excel 2013 was used to analyse data after it had been anonymised to prevent the identification of individual member responses. Three of the companies listed above returned a nil response.

Overview bar graphs of all R&D industry-academic links were created using data from this survey along with the previous surveys in 2003, 2005, 2007, 2009, 2011 and 2013. The overview shown in figure 1 was created using data from 2007 onwards as this was the first year that undergraduate industrial placements were recorded. Non-R&D links were not included as surveys carried out before 2013 were only intended to capture those in R&D.

Bar graphs show numbers of individual links, eg number of undergraduate placements, number of PhD students etc. whilst pie charts show percentages.

Glossary

ABPI	Association of the British Pharmaceutical Industry
AR-UK	Alzheimer's Research UK
BBSRC	Biotechnology and Biological Sciences Research Council
CCN	Centre of Cognitive Neuroscience
CDT	Centre for Doctoral Training
CTTV	Centre for Therapeutic Target Validation
DSTT	Division of Signal Transduction Therapy
DTP	Doctoral Training Partnership
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
GSK	GlaxoSmithKline
GVA	Gross Value Added
HR	Human resources
IMED	Innovative Medicines and Early Development
IMI	Innovative Medicines Initiative
IT	Information technology
IP	Industrial placement
Marie Curie IAPP	Marie Curie Industry-Academia Partnerships and Pathways
MCCIR	Manchester Collaborative Centre for Inflammation Research
MRC	Medical Research Council
NC3Rs	National Centre for the Replacement, Refinement and Reduction of Animals in Research
NoWCADD	Northwest Centre for Advanced Drug Discovery
ORBITO	Oral Biopharmaceutics Tools Project
PhD	A Doctor of Philosophy degree
R&D	Research and development
REF	Research Excellence Framework
SGC	Structural Genomics Consortium
SIP	Science Industry Partnership

List of 'Other EU' and 'Non-EU' countries: postdoctoral collaborations

Other EU	Non-EU
Denmark	Argentina
France	Australia
Germany	Brazil
Italy	Canada
Netherlands	Chile
Portugal	China
Spain	Colombia
Sweden	Japan
	Kenya
	Singapore
	Switzerland
	Thailand
	Uganda

Complete overview

The ABPI industry-academic links survey has evolved considerably over the past 13 years. In 2003 and 2005 information was only sought on PhD studentships and postdoctoral collaborations, whereas now information is sought on nine types of links, ranging from apprenticeships to academic posts.

Industry-academic survey trends

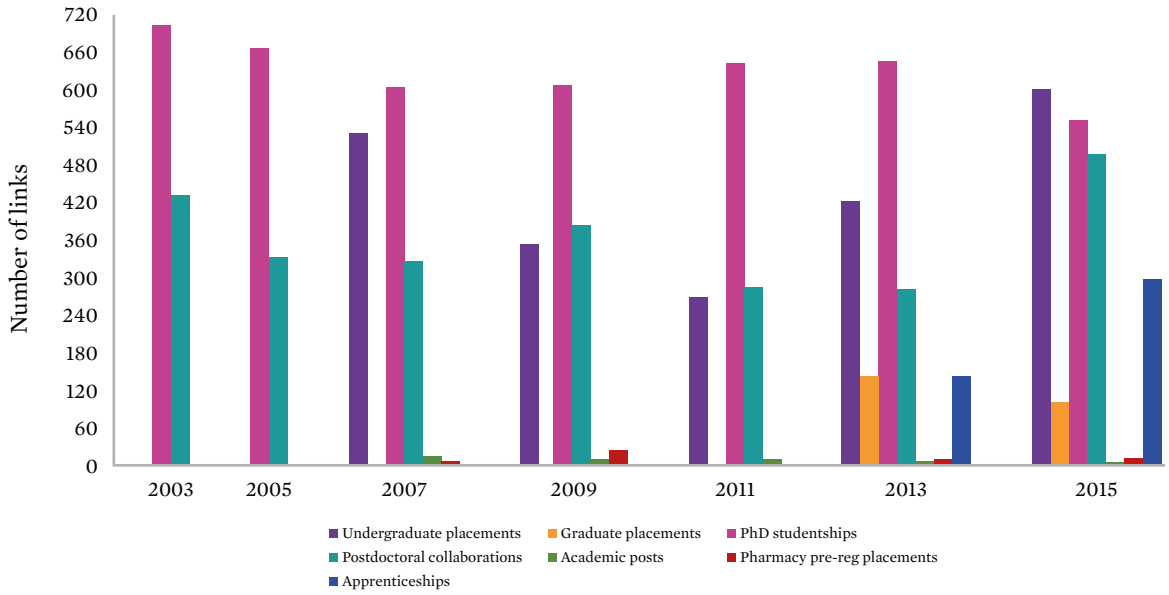

Figure A1. Trends in the number of links recorded from 2003 to 2015.

NOTE: Up until 2015, members were asked for the number of postdoctoral grants; in 2015 the number of individual postdoctoral researchers was sought. Academic posts include visiting professors and fellows. Where there are zero links for a category within a particular year, it is because data of that kind was not sought. F1 F2 medical training posts are not included as none have ever been recorded. Links have not been separated based on business area in this graph; please see previous figures.

Additional data

2013 Top 20 UK academic institutions for all undergraduate IPs

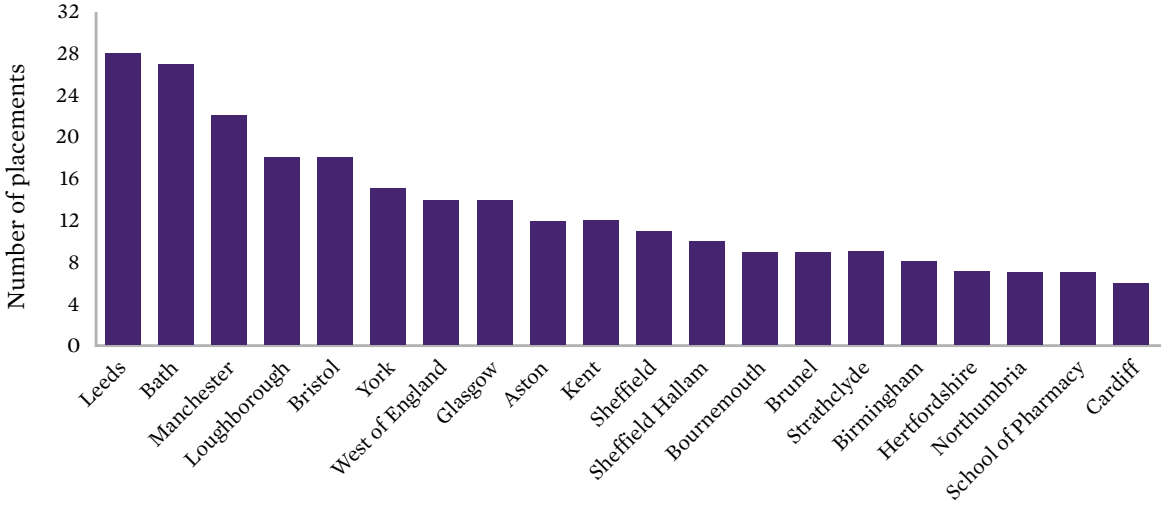

Figure A2. Top UK academic institutions with undergraduate students successfully obtaining industrial placements in all business areas in 2013.

2013 Top 20 UK academic institutions for PhD studentships

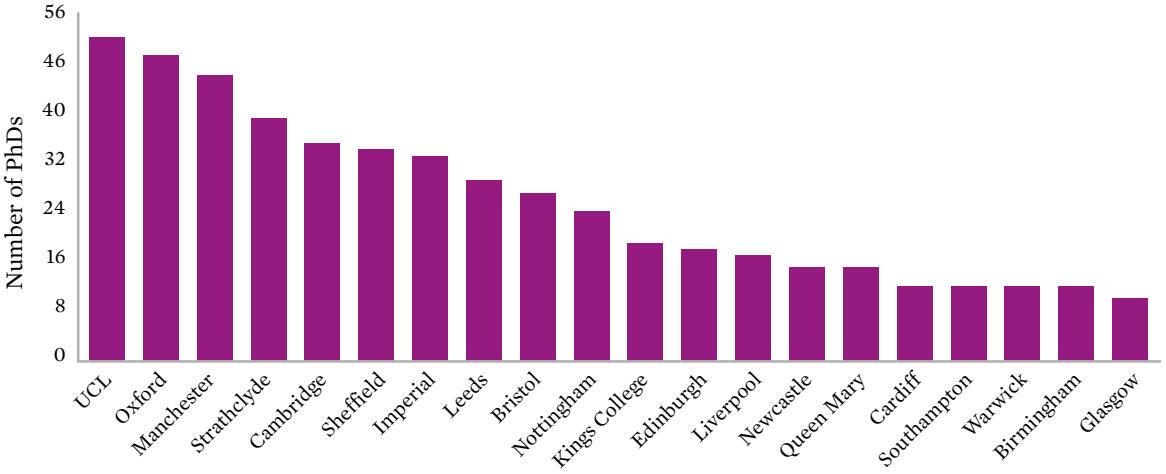

Figure A3. Top 20 UK academic institutions for collaborative PhDs in 2013.

2013 PhD funding partners

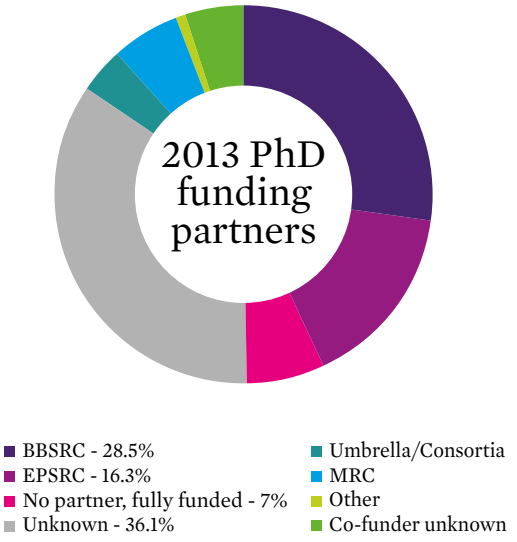

Figure A4. Funders of PhD studentships, 2013. NOTE: Umbrella/Consortia includes umbrella agreements and consortia where partners were not listed.

2011 PhD funding partners

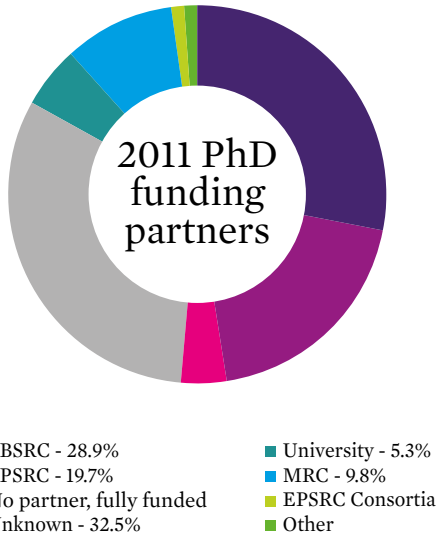

Figure A5. Funders of PhD studentships, 2011.

Notes

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