

PHARMACOLOGY Pm MATTERS



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Today's science. tomorrow's medicines

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The Newsletter of the British Pharmacological Society

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A photograph of several industrial chimneys against a clear blue sky. The central chimney is emitting a thick plume of white smoke that rises into the air. The chimneys are dark in color, and the overall scene is brightly lit, suggesting a clear day.

An industrial revolution
can industry adapt to survive?

25 years in the pharmaceutical industry | future steps | invest in UK research excellence



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Today's science, tomorrow's medicines

Hold the Date!

Meetings & Events

To register or find out more
about our events, please contact:
meetings team on +44 (0)207 239 0176
e: meetings@bps.ac.uk
w: www.bps.ac.uk

Dates in our Programme:

8-9 March 2012

James Black meeting
Challenges in Neurotherapeutics:
From Animal Models to Clinical Needs
Dublin, Ireland

19-21 March 2012

The Biomedical Basis of Elite Performance
Joint Meeting with the Physiological Society
Queen Elizabeth II Conference Centre, London

23-24 April 2012

4th Focused Meeting on Cell Signalling
University of Leicester, Leicester

11 April 2012

Statistics Workshop
King's College London, London

11 May 2012

Rational and Safe Prescribing - the Way Forward
Dublin, Ireland

7-9 June 2012

Focused Meeting on Neuropeptides
King's College London, UK

Editorial

An industrial revolution is underway, the pharmaceutical industry is in transition, and to quote (sort of) Charles Darwin it is those most adaptable to change that will survive. The traditional boundaries between academia and industry are blurring as drug discovery navigates the current economic turbulence.

In this issue, our President shares his thoughts on more than 25 years working in the pharmaceutical industry. It is a fascinating read, recounting the mergers and redundancies that peppered drug discovery throughout his early career and the creation and development of many of the drugs we take for granted today. It is also a very personal retrospective, with plenty of reminiscences about past and current BPS members that will have you reaching for your contact books again. Ray steps down from his role as BPS President at the end of 2011 and I would like to take this opportunity to thank him on behalf of the BPS office, our Trustees and members, for all he has done for the Society over the tenure of his presidency. Phil Routledge succeeds Ray as President from 1 January 2012 and we look forward to welcoming him in the New Year.

Elsewhere in this edition of PM, David Bell, Senior Consultant at Futurestep, offers an insight into life sciences recruitment and how you can get ahead in a fiercely competitive job market on p10, followed by an article on research investment in the UK. Karen Gurney and Jonathan Adams, from Thomson Reuters, discuss the challenges facing, and ways to boost, dwindling investment in the industry.

'The future ain't what it used to be', says Richard Hargreaves and Yogi Berra (US baseball player, manager and coach); Nikolas Dietis echoes this sentiment in his article the domino that 'downgrades' the PhD.

There are also articles from Dr Mark Downs, CEO, Society of Biology, highlighting the vital role of technicians, and our regular updates from the Young Pharmacologists, Education, Meetings, and an announcement on the beta site launch of Prescribe e-Learning!

As we approach the end of 2011 with this issue, it is time to say goodbye and thank you to our President, Treasurer, and Meetings VP, who all step down from their current roles at the end of 2011. Ray Hill, Danny McQueen and Robin Hiley have been unwavering in their support of and commitment to the Society and pharmacology over the years. It is my pleasure to welcome our incoming: President, Phil Routledge; Meetings VP, David Webb; and Treasurer, Robin Hiley.

If you would like to comment or discuss any articles in this issue please email me (hom@bps.ac.uk). You may also want to join the Industrial Pharmacology discussion group, or any of the many other e-groups that are available to you, online within the BPS e-community site at (community.bps.ac.uk).

Enjoy

Hazel



Hazel O'Mullan
Managing Editor BPS

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View from Angel Gate



Kate Baillie BA MA MBA
Chief Executive BPS

I am pleased to report that the new members of the BPS staff team are now all in post, and a new Managing Editor for BJP and BJCP, Dr Stephen Montgomery has joined the Wiley Blackwell team in Oxford, to replace Katie Howard. Our most recent BPS staff recruit, Jess Strangward, Head of Education joined us in August from Understanding Animal Research, where she was Schools Liaison Officer. Jess is now working closely with Nick Goulding, to drive the diverse Education and Outreach agenda at BPS. More information on the Education Committee's activities is on p22. Thanks as ever to all the other BPS staff who provided cover and rallied round during the recent periods of staff shortage.

The Meetings committee and staff team have been kept very busy in recent months with a bumper series of meetings and education workshops. Both the 12th *International Conference on Endothelin* and the first James Black conference organized by the Industry Committee, on *Biologics for the New Millennium* attracted in excess of 100 delegates, and interestingly, in both cases, more than 80% of the delegates were not BPS members, so this presents us with a great opportunity to recruit new people to the Society!

Preparations are well underway for the Winter Meeting, with 500 delegates pre-registered to date and over 300 abstract submissions. We are delighted that to date we have over 30 registrants from the Chinese Pharmacological Society (CPS) and 49 abstracts submitted for consideration as posters or orals. This enthusiastic response augurs well for our first joint symposium on *Drug Development and Clinical Research in China*, with the CPS which is being held on the morning of 14 December. We hope that as many members as possible will attend this session to welcome our Chinese visitors. For more information on BPS meetings see Meetings report on p24.

During September we also held a series of four Prescribing Skills Assessment workshops. As a result of this, we now have around 58 trained question writers. A further two day peer review workshop will be held in February 2012 and it is anticipated that a bank of around 700 items for 20 separate, test equated assessments will have been created by July 2012. We are also delighted to announce that all students and members of staff from medical schools in the UK and Ireland now have the opportunity to take part in evaluating the *Prescribe e-learning* beta site. For more information please see p26 or visit (www.prescribe.ac.uk).

In addition to the Biologics conference mentioned above, and the delivery at this year's Winter Meeting of a joint symposium with the clinical section and the AHPPI (Association for Human Pharmacology in the Pharmaceutical Industry), the BPS industry committee has been active in formulating its objectives for the coming year.

An important new initiative which members would like to explore is the creation of a Guide to Target Validation, which could become a key enabler for Open Innovation activities. It would aim to bring together key data about targets, preclinical and clinical data (especially where clinical trials show no effect) to be able to elucidate key information on trial design, patient selection, and use

of biomarkers in determining the link between compounds, targets and efficacy and safety.

It is hoped that the Guide to Target Validation could be linked to The Guide to Pharmacology (www.guidetopharmacology.org) the online portal to dynamically updated searchable versions of the BPS Guide to Receptors and Channels (GRAC) and the IUPHAR nomenclature database (IUPHAR-DB), due for launch in late 2011.

We continue to pursue links with a variety of other Societies, and have been in discussion with the RSC (Royal Society of Chemistry), ABPI (Association of the British Pharmaceutical Industry), BIA (Bioindustry Association), (SB) Society of Biology, EPHAR (The Federation of European Pharmacological Societies) and the SCI (Society of Chemical Industry) in recent months to look at developing joint activities. An interesting development from attendance at the recent ELRIG/SBS conference in Manchester was the development of an educational outreach programme with the Dana Centre. The use of robotics is becoming more and more prevalent in the drug discovery process, by attending ELRIG the BPS ensured it was speaking to this new audience. It was a perfect opportunity to engage with scientists who have found themselves in pharmacology despite training in an entirely different discipline. It was fascinating (and slightly terrifying) to see how dexterous and fluidly the robots could move however the most terrifying encounter was with Dr Steve Trimmel. His company Venomtech breeds and milks the venom from the most dangerous creatures from across the globe and sells it to research. Luckily Dr Trimmel (and his snakes) is keen to work with the BPS for our outreach event at the Science Museum next year, from *Venom to Viagra: past, present and future of drug discovery*.

This year's AGM will see Ray Hill step down as President, to be replaced by Phil Routledge. I would like to extend a personal thanks to Ray for his boundless energy, enthusiasm, support, encouragement and leadership during the past four years as President Elect and President. I will miss his wise counsel, but hope that he will still be very much involved with the BPS, both as President Emeritus and also as our representative on the Planning Committee for the British Festival of Neuroscience in 2013.

Phil and I are hoping to convene a meeting of the Trustees of BPS to look at planning the agenda for BPS for the next five years early in 2012. We would love to hear views from the membership about future priorities for the BPS. Please send your thoughts to me at (kb@bps.ac.uk).

I look forward to seeing many of you at the forthcoming Winter Meeting, and if you haven't yet registered, please do so soon while there are still places available! While you are on the website, you might like to take the opportunity to donate to the Young Pharmacologists Committee fund to offer a bursary to enable one or more African scientists to attend WorldPharma 2014, which will be held from 13-18 July 2014 in Cape Town, South Africa. So far through the sale of the "I love pharmacology" T shirts and online donations, this fund has raised in excess of £1200 for this important cause.

Thoughts on more than 25 years in the Pharmaceutical Industry



Ray Hill
BPS President

Beckenham and Bristol

My first experience of working in the pharmaceutical industry came in 1970 during my time as a PhD student at the School of Pharmacy. As I was supported by a grant from the Wellcome Foundation, I was expected to spend one day a week working at their laboratories in Beckenham and found myself in the group of Alistair Miller working on discovery of novel anticonvulsant drugs. The environment there was rather formal and old fashioned compared with the academic department where I spent most of my time. Everyone at Beckenham was friendly and interactive although there was not much sense of pressure to succeed. The croquet games at lunchtime on the lawn in front of the mansion summed up the ethos very well! I helped develop some animal models that were helpful in the project that (much later) led to the drug we now know as lamotrigine but I was not inspired to move into industry at that point in my career. My PhD supervisor Donald Straughan advised me very strongly to seek an academic career so I applied for and was appointed to a lectureship in Jimmy Mitchell's department in Bristol where I then experienced a very happy 10 years. I did not completely escape from the influence of industry in Bristol as when John Vane (fresh from the discovery of the mechanism of action of aspirin and recent recipient of a Nobel prize) became the Head of R&D for the Wellcome Foundation and Jimmy was enrolled as a consultant, I somehow became engaged as an assistant to Jimmy in this role and accompanied him on his trips to Beckenham. The scientific pace was noticeably higher there under the new regime especially after Jim Black (the prime mover behind the discovery of cimetidine and propranolol and shortly to receive a Nobel Prize!) also joined Wellcome as Head of Research. One benefit of working with this industrial group was that I had access to some of their novel compounds and my Bristol group was able to work with and publish on some of the first synthetic enkephalin analogues. I remember one particular day when the progress of the Enkephalin Project was being reviewed at Beckenham. It started with a substantial lunch in John's outer office (guinea fowl washed down with fine Burgundy – one of the first indications I had that there might be fringe benefits to life in industry!) with John, David Graham-Smith, Les Iversen, Jimmy and Richard Miller (at that time working for Wellcome at their US site in NC). We then processed to the conference room to be greeted by the senior members of the Wellcome discovery team who presented their latest results. After about an hour of data slides, both chemical and biological, John turned to the senior chemist on the team, Sam Wilkinson, and asked 'well what have we achieved' to which Sam replied 'we have found a more expensive way to make morphine!' This neatly summarises the ups and downs of life in industry that later became very familiar to me.

Glaxo at Greenford

I developed links with other parts of the UK pharmaceutical industry as the reputation of my Bristol research group grew and I had contacts with Lilly (through Bill Dawson who was then the

Head of Research at their UK site), Wyeth and the then ICI. Perhaps most significantly I had been appointed as final year career advisor to the Bristol BSc Pharmacology course and one of my duties was to arrange an industry visit each year to show the students a little bit about potential career choices. In 1981 the trip was to Glaxo at Ware and we were well looked after by Roy Brittain and his colleagues. At lunch I happened to mention to Roy that I was operating under false pretences as, other than my day a week as a PhD student, I had never actually worked in industry and so was not qualified to give the students advice. He then asked me if I would consider taking a sabbatical in industry should the opportunity arise and not thinking about the possible consequences I said yes. About 3 months later he phoned and told me that one of the group leaders from the Greenford site, Ann Hayes (later head of CNS research for GlaxoWellcome), was about to go on maternity leave for six months and he and Mike Tyers (then the Pharmacology department head at the Greenford site) offered me the position of acting Head of the Analgesia Group whilst she was away. I said that I would look into it not thinking that the University would be prepared to let me go. However, the period in question was April to October so much of it was covered by the long vacation and Glaxo were prepared to let me return to Bristol in May/June for my examining commitments. Jimmy Mitchell said he thought that it would be alright for me to be away but suggested I ask the VC, Alec Merrison, to approve my absence. This was the time of the first round of University funding cuts in early 1982 and the VC's first question was 'are they paying your salary?' to which I answered in the affirmative and he immediately said I should go! I then spent 6 months as a commuter to Greenford with a first class season ticket from Bristol Parkway to Paddington. I met a lot of people who have since become firm friends in particular Mike Tyers, Malcolm Skingle and John Brown. I also met up with Donald Straughan once again as immediately after telling me not to take a position in industry he had accepted the job of Director of Pharmacology at Greenford! The six month sabbatical taught me that there was good science going on in industry laboratories and that drug hunting could be fun. I also learned that when you travelled to a conference as an industry scientist you flew business class and stayed in good hotels, which was certainly not the way impoverished lecturers were used to being treated!

Moving to PDRU in Cambridge

My return to academic life was relatively smooth although my experience of a life of plenty on the dark side did not make me enthusiastic about the imposition of charges to my grants for postage and photocopying together with reduction in other services which had previously been provided free by the university. I was therefore in quite a receptive frame of mind when John Hughes (the discoverer of the enkephalins in the 1970s whilst working with Hans Kosterlitz in Aberdeen but then at Imperial) called me at the end of 1982 to ask if I would be interested in helping him set up the Parke Davis Research Unit (PDRU) in

Cambridge which was to work on neuropeptide targets for new drugs. PDRU was a then novel concept being an industry funded research unit that was also an adjunct department of Cambridge University. It seemed to provide an ideal way to work in industry without burning my bridges should I wish to return to an academic position so after some hesitation I said yes. There was then a rapidly arranged trip to Ann Arbor in an extremely cold Michigan winter to gain the seal of approval of the Head of Research, Don Maxwell (a British ex-pat and Downing College graduate), his boss Gerry Weisbach and other new colleagues before I joined John, David Horwell and Colin Clark in a Portakabin on the Forvie site next to Addenbrookes Hospital in January 1983. It was an exciting time of recruiting staff, making plans for our first projects and ordering new equipment. As I had to complete my teaching commitment for the academic year in Bristol and was not planning to move my family to Cambridge until April I became a commuter once again driving from Bristol to Cambridge and back several times a week. My elderly car soon gave up under the strain and after I had travelled from Cambridge to Bristol on the back of a recovery lorry, John thought it might be time to give me a company car! That certainly made life easier and less stressful. I spent five years at PDRU in Cambridge and it was eventful (for example, our Portakabin burned down before our permanent building was ready!), enjoyable and productive both in terms of getting our first drug into development and publishing some original research. Colleagues who worked on the permanent staff and who we recruited have gone on to do great things (eg John Hunter who is now site head at the Merck West Point research site following their merger with Schering Plough). However, the expansion of PDRU that eventually happened was not then on the horizon and even though I had inherited Colin Clark's group to add to my own department when he moved to a job in Ann Arbor, I still only had some 20 people (a mixture of permanent staff, academic visitors and graduate students) under me and thus my research horizons were limited.

SKF in Welwyn

1988 I was therefore ready when the next big change in my life came and I was approached about becoming Director of Pharmacology for Smith, Kline and French (SKF) at Welwyn, a much bigger job with some 70 staff and responsibility for multiple projects. Tim Rink (who became my boss) was VP of Research on the site and had recently taken the position after moving from Physiology in Cambridge. After expressing interest within days I was travelling on a hectic 24 hr trip to Washington to meet George Poste (then Tim's boss) and then to Philadelphia for a 7am meeting with Stan Crooke (then Head of R&D for SKF but who resigned a short time after I was offered the job – I like to think the two events are unconnected), a tour of the labs and meetings with a whole variety of people, dinner with Bob Ruffolo (then Director of Pharmacology in SKF Philadelphia and later Head of R&D for Wyeth) and back to the UK. There was great energy and a real sense of urgency at Welwyn in those days. I was fortunate to inherit Mike Parsons (who had worked with Jim Black at SKF on the discovery of cimetidine) as head of the GI group and Mike Wood (later to move to senior positions elsewhere and now at Vernalis) as head of cardiovascular together with various specialist teams headed by Alberto Kaumann, Roger Eden and others. Paul England headed up a parallel biochemical pharmacology department and the chemistry departments were headed by Larry Kruse and Charlie Brown forming a compact management team under Tim's leadership. Roger Brimblecombe (former head of Porton Down research before moving to SKF and still active as a colleague on ACMD and a very long standing member of

the BPS) was also a senior VP based at Welwyn but then giving most of his attention to opportunities arising outside the company and he gave me the first opportunity I had to visit Japan as part of a team exploring possible collaboration with Suntory. As they were a drink company as well as a pharmaceutical one we had to attend the opening party for a new brewery as part of our duties on the trip – talk about a perfect job for a pharmacologist! I was given the task of reducing the size of some of the existing therapeutic area groups at Welwyn to generate headcount for a new CNS group and was fortunate to be able to recruit Jackie Hunter (later Senior VP for Neuroscience at GSK) to head this new venture. All was going well until in early 1989 it was announced that we were to merge with Beecham. Immediately life became chaotic and I had my first contact with management consultants (in the shape of McKinsey) whilst working on various teams tasked to merge the research portfolios of the two companies. The consultants went around asking all of the research leaders questions about what we were doing and what we thought should happen then replayed the answers to our senior staff after charging a large fee – it seemed a very easy way to earn a living! We had alternate meetings (where I had some of my first interactions with Tom Blackburn as a colleague although we had met previously at BPS meetings - usually in a bar!) at the two UK sites and at the SKF site in Philadelphia and I had my first experience of being a trans-Atlantic commuter! As the merger began to take shape it was clear that the initial management of the UK R&D operation would be by our ex-Beecham colleagues and Tim decided to leave and move to the then new company Amylin in San Diego (he was later CEO of Aurora when it was sold to Vertex and as a financial consequence now has to live in Monaco!).

Merck at Terlings Park

Unsettled by the changes going on I was again receptive to a move when Les Iversen asked if I would be interested in the position of Director of Pharmacology at the Merck Neuroscience Research Centre in Harlow which he headed. In 1990 I made my last move of company and started work at Terlings Park. It was soon apparent that the move back to full-time Neuroscience suited me well (see figures 1 and 2) and I was able to get involved in a range of projects on targets from neuroprotection to pain and migraine to Alzheimers disease to depression to emesis. I met many new colleagues and friends (notably Richard Hargreaves (now worldwide head of Basic Neuroscience for Merck), Nadia Rupniak (now a VP in biotech), Sara Shephard, Jenny Laird (now at Astra Zeneca, Montreal), David Williamson (now at Cambridge) Sue Boyce and David Tattersall (now at GSK Shanghai R&D)) who were already in the department or were hired shortly after my appointment. My fellow department heads (Ray Baker, Ian Ragan and Micky Traub) also soon became new important research collaborators and I renewed contacts with people I already knew such as Les, his wife Sue and John Kemp. The pace of life was rapid and intense with many changes (not the least of which was Sue moving to the Chair of Psychology in Oxford and Les retiring!) but it was never boring. I had the opportunity to travel extensively with responsibility for some research going on in Japan and an oversight role for pain research worldwide as well as having a team of talented scientists in my department. Franz Hefti (later worldwide head of Neuroscience for Merck then very successful in biotech with Rinat and Avid) came in as the new site head at Terlings Park and gave me the additional responsibility for Neuroscience Licensing which I found very interesting and challenging. As a result of research done in my department we were fortunate enough to be able to

launch two new drugs, rizatriptan for migraine and aprepitant for chemotherapy induced nausea and vomiting (the latter project being a mega-collaboration with our colleagues in the Rahway lab in New Jersey). In 2002 I was asked to become head of a new European Licensing and External Research group and I kept this position until my retirement in 2008. I was able to persuade Margaret Beer and Tim Sparey to move with me from the UK research labs into this new venture and I added Manfred Horst from MSD Germany, Hans Bostrom from MSD Sweden and an old PDRU colleague Rob Pinnock to complete the team. We had a happy five years exploring the collaborative opportunities across Europe and did some significant deals.

The present day and conclusions

My choice now is to work with small companies, some of which have kindly given me non-executive director positions, and to try to pass on what I have learned from my time working in large companies.

I consider myself lucky to have been well paid to follow a career that was almost a hobby and to have been given the freedom to work on projects of my choice. I had excellent colleagues throughout too numerous to mention (and have deliberately not mentioned the names of any of my graduate students and postdocs in this account as they were all special people and I do not have the space here to do them justice). I realise that life in industry and in academic life have changed greatly in

the last 10 years and that in some ways I experienced the halcyon years in both environments. Looking back, most of the companies that I worked for or collaborated with no longer exist. The Wellcome Foundation was swallowed by Glaxo to become GlaxoWellcome, Parke Davis was bought by Pfizer, SKF merged with Beecham to become SB which later merged with GlaxoWellcome to become GSK. Nevertheless pharmacology is alive and well (see any recent issue of either of our journals!) and there is still a high medical need for new drugs (see table 1). The boundaries of where drug discovery should be conducted have become blurred and we shall know in the next five years whether this is something that can be followed successfully in an academic environment. There is no doubt that cut backs in large pharmaceutical companies puts the onus on small companies to be our major source of new medicines and thus times continue to be exciting. I encourage anyone who is interested and motivated to get involved in drug hunting and I hope that if you do you will enjoy your time doing it as much as I have. The BPS has played an important part in my life from the time of giving my first oral communication at the summer meeting in 1971 (in a session chaired by Hans Kosterlitz) through to the present day and its meetings have been an important way of keeping in touch with friends old and new, industrial and academic.

The recollections above are entirely my responsibility and any mistakes of fact or timing are likely to be due to my aging synapses. Apologies in advance if your memories of the events described differ from mine!

Figure 1.



The experiment – a very much posed picture of members of the Headache Research group in the *in vivo* lab (taken at Terlings Park in the mid-1990s). From the left Richard Hargreaves, Sara Shephard, David Williamson and Hester Visser. I think this was taken for an internal company publication but never used.

Figure 2.



The project meeting – another posed picture from the same set! Richard and Hester again with Ray and a member of the clinical team.

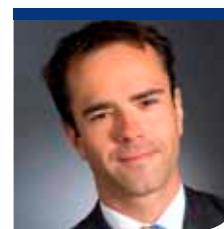
Key medical breakthroughs over the past 40 years (source: ABPI)

Table 1.

1970 - 1979	1980 - 1989
<p>Levodopa (L-dopa) a major advance in Parkinson's Disease Mechanism of action of</p> <p>Aspirin discovered by Sir John Vane</p> <p>Becotide (Allen & Hanburys)</p> <p>Amoxicillin (Beecham) I</p> <p>Tamoxifen (ICI) introduced for hormone-dependent tumours</p> <p>Clozapine (Sandoz) first atypical neuroleptic for schizophrenia enters clinical trial</p> <p>Clotrimazole (Bayer) a major advance in treating fungal infections</p> <p>Nifedipine (Bayer) for angina and hypertension</p> <p>Atenolol (ICI) a beta-blocker introduced for various heart conditions</p> <p>Cyclosporin (Sandoz) a major advance in transplantation</p> <p>Cimetidine (SmithKline Corporation) launched for peptic ulcers</p>	<p>Acyclovir (Wellcome) major treatment for herpes launched</p> <p>Antibiotic</p> <p>Augmentin (Beecham) launched</p> <p>Captopril (Bristol-Myers Squibb) for high blood pressure</p> <p>Ranitidine (Glaxo) anti-ulcer treatment</p> <p>Fluconazole (Pfizer) key advance in treating fungal infections</p> <p>Sumatriptan (Glaxo) major advance in migraine</p> <p>Cholestyramine trial shows lowering of cholesterol and coronary heart disease</p> <p>ACE inhibitor Enalapril (MSD) for high blood pressure</p> <p>Zidovudine (Wellcome) first AIDS treatment</p> <p>Lisinopril (ICI/Zeneca) ACE inhibitor for hypertension and heart failure</p> <p>Diclofenac (Ciba-Geigy) anti-inflammatory agent</p> <p>Erythropoietin (Janssen-Cilag) natural red blood cell stimulator</p> <p>Omeprazole (Astra) gastric ulcers</p> <p>Simvastatin (MSD) lowering blood lipids</p> <p>Fluoxetine (Eli Lilly) depression</p>

1990 - 1999	2000 - 2010
<p>COX-2, a major new target for anti-inflammatory drugs, discovered by scientists at Searle</p> <p>First gene therapy experiment in a person with adenosine deaminase deficiency</p> <p>Filgrastim (Amgen) white blood-cell stimulant, G-CSF</p> <p>Etidronate (Procter & Gamble). First bisphosphonate in UK for osteoporosis</p> <p>Specific monoamine oxidase-B inhibitor Selegiline (Orion) approved for Parkinson's disease</p> <p>Acarbose (Bayer) first alpha glucosidase inhibitor for type 2 diabetes</p> <p>Paclitaxel (Bristol-Myers Squibb) approved in UK for treatment of ovarian cancer</p> <p>Dual serotonin and noradrenaline reuptake inhibitor Venlafaxine (Wyeth) approved for depression</p> <p>Lamotrigine (Wellcome) - major advance launched as monotherapy in epilepsy treatment</p> <p>Interferon beta-1b (Schering Health Care) - first treatment for multiple sclerosis</p> <p>Olanzapine (Eli Lilly) introduced for schizophrenia</p> <p>Losartan (MSD) first angiotensin 2 receptor antagonist for high blood pressure</p> <p>Ropinirole (SmithKline Beecham) launched for Parkinson's disease</p> <p>Saquinavir (Roche) launched – first protease inhibitor for AIDS in UK</p> <p>Malarone [Atovaquone and proguanil] (Glaxo Wellcome) a new treatment for P.falciparum malaria</p> <p>First medicines for Alzheimer's disease available – Donepezil (Pfizer) and Tacrine (Parke-Davis)</p> <p>Latanoprost (Pharmacia & Upjohn) first prostaglandin analogue for glaucoma</p> <p>Reboxetine (Pharmacia & Upjohn) first noradrenaline reuptake inhibitor for depression</p> <p>Viagra (Pfizer) first treatment for erectile dysfunction</p> <p>Rituximab (Roche) launched for rheumatoid arthritis</p> <p>Montelukast (MSD), a new class of inhaled medication, authorised for asthma</p> <p>Bicalutamide (Zeneca) launched for prostate cancer Meningitis vaccination programme initiated</p> <p>Zanamivir (Glaxo Wellcome) first neuraminidase inhibitor for treating influenza launched in the UK</p> <p>Oxaliplatin (Sanofi-Synthelabo) introduced for metastatic colorectal cancer</p>	<p>Herceptin (Roche) approved for breast cancer</p> <p>Rosiglitazone (GSK) and Pioglitazone (Takeda) New class of oral anti-diabetic agents</p> <p>Bupropion (GSK) launched for smoking cessation</p> <p>Caspofungin (MSD) – first of new class of antifungal agents</p> <p>Glivec (Novartis) a major advance in treating chronic myeloid leukaemia</p> <p>Linezolid (Pharmacia) – first entirely new class of antibiotic in 30 years</p> <p>Tiotropium (Boehringer) first long-acting anti-muscarinic agent for treating chronic obstructive pulmonary disease (COPD) launched</p> <p>Varilrix (GSK) First vaccine to protect against chickenpox</p> <p>Xigris (Eli Lilly) treatment for life-threatening sepsis made available</p> <p>Insulin glargine (Aventis) first long-acting insulin analogue for diabetes launched</p> <p>Fuzeon (Roche) for antiretroviral-resistant HIV infections introduced</p> <p>Ezetimibe (MSD/Schering-Plough), a new type of cholesterol-lowering agent</p> <p>Recombinant PTH teriparatide (Eli Lilly) launched for treating post-menopausal osteoporosis</p> <p>Duloxetine (Eli Lilly/Boehringer) First medical treatment for stress incontinence in women</p> <p>Bortezomib (Janssen-Cilag) for treating multiple myeloma</p> <p>Approval of the angiotensin receptor blocker Candesartan (Astra-Zeneca) and aldosterone antagonist Eplerenone (Pfizer) improve prospects for the treatment of heart failure</p> <p>Monoclonal antibody Efalizumab (Sero) launched for treatment of moderate-to-severe chronic plaque psoriasis</p> <p>Erlotinib (Roche) new oral treatment for advanced or metastatic lung cancer launched</p> <p>Anti-IgE monoclonal antibody Xolair (Novartis) introduced for asthma treatment</p> <p>Rivastigmine (Novartis) for dementia in Parkinson's disease</p> <p>Approval of two new monoclonal antibodies – Cetuximab (Merck) and Bevacizumab (Roche) improves survival prospects for patients with metastatic colorectal cancer</p> <p>New type of antibiotic Tigecycline (Wyeth) approved for complicated skin and abdominal infections</p> <p>Anti-TNF- monoclonal antibody Infliximab (Schering-Plough) introduced as first biological agent for severe, treatment-resistant ulcerative colitis, following earlier approval in Crohn's disease</p> <p>Exubera (Pfizer) First inhaled insulin</p> <p>Rotarix (GSK) launched as first vaccine to protect infants against gastroenteritis due to rotavirus</p> <p>Cervarix (Glaxo SmithKline) and Gardasil (Merck & Co) licenced in Europe for prevention of cancers associated with infection by Human Papilloma Virus (HPV)</p> <p>Raltegravir (Merck & Co) – first integrase inhibitor to treat HIV</p> <p>Trastuzumab (Genentech), licenced for treatment of HER2 positive breast cancer – an example of stratified medicine</p> <p>Gefitinib (AstraZeneca) the first selective inhibitor of epidermal growth factor receptor's (EGFR) tyrosine kinase domain, for EGFR mutation positive non-small cell lung cancer patients licenced in the EU – a further example of stratified medicine</p> <p>Denosumab (Amgen) approved in EU and US – the first biological agent for the treatment of osteoporosis</p>

Future steps



David Bell
Senior Consultant, Futurestep

Futurestep is a Leading Global Provider of Strategic Talent Acquisition Solutions. Our solutions range from Recruitment Process Outsourcing to Talent Acquisition Consulting, Project-Based Recruitment and Mid-Level Recruitment. Through these solutions, we help companies and individuals achieve business impact through effective talent operations.

David Bell joined the Futurestep UK division of Korn /Ferry International in 2010 as the Senior Consultant in Life Sciences. He is personally responsible for execution of middle-to-senior level Search assignments across Commercial, R&D and Corporate functions in the Life Science and associated sectors.

David spent eight years in industry, undertaking commercial and operational roles with both GSK and AstraZeneca. He began his career with PricewaterhouseCoopers in London.

If you are brave enough to open a newspaper or watch the news at the moment, you could be forgiven for thinking that the end of the World is upon us. This perception could be reasonable, particularly from an employment perspective, with job losses across many companies in all industries. Traditionally, Life Sciences has been seen as a safe and secure industry to work in. If not a job, most likely a career for life was available to those with solid scientific backgrounds and inquiring minds. Individuals would come in to work in the laboratory or research organization, or in a commercial environment and could then enjoy relative security moving to more senior individual contributor positions, then management and ultimately senior management. Sadly, whichever industry sector you work in these days, this obvious career path within a single organization is increasingly rare.

With high profile changes in the UK, Pfizer closing its R&D facility in Kent, Shire establishing a European hub in western Switzerland and consolidation across the industry, most recently Takeda acquiring Nycomed, it seems we are in challenging times. Further, this downward trend is not restricted to the private sector, with public sector and academic roles being culled in sizeable numbers also. Efficiency benefits by cutting costs in manufacturing, sales and marketing and administration benefit companies and shareholders, but leave employees in a constant state of flux. For example, the Chartered Institute of Personnel and Development (CIPD) has calculated that more than 600,000 public sector jobs will go between 2010-11 and 2015-16. Given this upheaval, Global Novation's Pulse Survey on 2011 Talent Management Challenges suggested that 53% of respondents indicated that employee engagement has been negatively impacted by the economic conditions of the past 24 months. So, not surprisingly, over half of employed people are concerned by issues other than their day to day work at the moment. This creates a downward spiral of productivity and engagement which ultimately is not good for either employer or employee.

However, although the headlines are all very negative, it is not all doom and gloom. In other sectors, such as Financial Services, the employment opportunities are diminishing significantly, but in the Life Sciences industry, there continue to be opportunities at all levels. According to a report by the Work Foundation, healthcare has been pinpointed as a key sector capable of substantial jobs growth in the next 10 years. With an ageing population driving a global demand and a drive by the government to maintain R&D as a stalwart of the UK economy, companies are still recruiting, albeit in restricted numbers. What is changing is the environment in which we all work. People need to be able to clearly differentiate themselves as the opportunities become more competitive. We need to be more flexible and more agile in our job roles and our career views. Working for different organizations gives us a variety of experience and viewpoints which can be of value to a new employer. Using relevant skill sets to work in different organizations can be valuable to growing companies. CEOs across the globe are focusing on creating smaller, more entrepreneurial units, more reminiscent of biotech start ups. Diversification into other niche areas such as consumer, animal health, vaccines and generics is another strategy being employed by the likes of GSK, Novartis and Sanofi Aventis.

So what does this mean for individuals and organizations? In a challenging economic climate, it is crucial that businesses not only attract people, but also make sure they are the right people. But how do they do that during the recruitment process? One way is to look at a CV. This contains the technical and experience information to tell a prospective employer whether an individual could add value. At Futurestep, we call this step the Price of Admission. You need to tailor this aspect of your application in order to get to interview. Your CV should therefore contain your successes and achievements as well as your job role and description. You must highlight what you have brought to the role to add value to the company. The next level is often an initial interview, perhaps informal and unstructured, where an historical review of your background and motivations is undertaken. Here, you need to provide evidence of viable reasons for the roles you have undertaken and what you achieved in each of these. If you are able to provide examples that match the job description requirements and you are enthusiastic about the company and the role on offer, you may well progress. So far, nothing spectacular. But in the current climate, companies are starting to look for something different, using a more scientific and analytical approach. They want to be able to see if individuals can measure up to the core competencies that they have identified as critical to the success of their organization. To that end they are looking to bring Talent to their company, no longer merely filling a job role. Talent is the lifeblood of every successful business. The impact that talented people can have to initiate change and deliver cut-through performance is huge. Successful businesses need to attract talented people and maximise their impact.

At Futurestep, we understand that impact is not about one thing but three: that talented people make an immediate impact, a longer term impact and that both have a consequential impact on the other people around them. What individuals need to think about is what impact are they making in their current role and what can they do, either internally or externally, to make themselves ready for their next role or to get where they want to in their career? What are your strengths, which areas or competencies do you need to focus on to make yourself a better leader, or to grow your leadership potential? At every level, you can develop and reinforce competencies to enable you to succeed in role or at the next level. Korn/Ferry International's ProSpective Assessment, which is available exclusively on LinkedIn, can give you a guide to your strengths and areas for development. Based on the proprietary science of Lominger, a Korn/Ferry company, ProSpective can give you the self awareness you need to improve on-the-job performance and get what you want out of your career. In just 10 minutes, you can learn your top leadership characteristics and your areas for development. You also have the opportunity to validate your results by inviting

select LinkedIn connections to participate in your assessment (<http://linkedin.kornferry.com>). In this case, the results relate to the individual, but companies use these competencies as a scientific method of assessing an individual's suitability for a role within an organization.

Within Life Sciences at the moment, recruitment remains strong. But competition is fierce. Companies are taking longer over hiring decisions and are more cautious generally, but overall recruitment levels at mid-management and more senior level remain relatively buoyant. Smaller organizations, operating in niche environments, offer excellent opportunities and often work alongside academia and research. The EU-backed Innovative Medicines Initiative is trying to bring companies and universities together to facilitate this close working environment. Companies are innovating and adapting to a new environment and way of working. Whilst we are in difficult times, those who are prepared to work on their own development, over and above the day to day work, can and will still flourish.

BPS to explore collaboration with Pharma, Biotech and Academic Societies



Dr Martin Todd
Chair of Industry Committee (BPS)

The BPS, which has around 3000 members at work in drug discovery and development across industry and academia, are pleased to announce our intention to hold cross-sector collaborative talks in the New Year.

The purpose is to highlight areas of synergy between pharmaceutical companies, biotechs and academic societies that might prove beneficial in encouraging growth and investment in the UK, promote a culture of innovation and collaboration, and ultimately deliver new medicines.

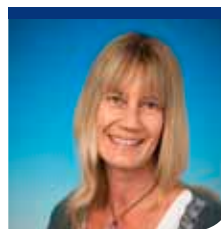
We think the future of Pharma R&D in the UK means long term investment, where innovative ideas and skills at the bench and in the boardroom are critical to success. Collaboration between industry and academia and between scientists of different disciplines is essential, and there is a much higher emphasis on partnerships across organizations and across national boundaries. The UK has a strong scientific skill base which needs to be supported, and we think that Learned Societies can play a key role in promoting scientific dialogue and training and development.

We will invite representatives from organizations at work across the R&D pipeline to meet and identify common messages which could be used to gain support from Government, Research Councils, Trade Associations and Industry. Ultimately, we hope this activity will support the maintenance and development of a skilled scientific workforce that can excel in delivering novel medicines through innovation and collaboration.

The first cross-sector meeting will be hosted in our central London offices in the New Year. If you would like to take part on behalf of your organization or institution we would be delighted to hear from you. Please contact Jonathan Brüün (jb@bps.ac.uk), Director of Communications and Business Development, for more information.

Pharmaceuticals invest in UK research excellence: why don't others?

Karen Gurney &
Jonathan Adams
Evidence Thomson Reuters,
Leeds, UK



Karen Gurney is Manager, Bibliometric Reporting at Thomson Reuters. She works on analyses of the European life sciences research base and has produced reports for pharmaceutical companies in Europe and North America.

Jonathan Adams is Director, Research Evaluation at Thomson Reuters. He was a member of the science policy staff at the UK Advisory Board for the Research Councils.

Where will we find innovative approaches to address future UK quality of life and wealth creation? Life sciences in the research base and pharmaceuticals in the private sector increasingly look like the part of the knowledge economy that works. The puzzles are: why we don't realize our potential more effectively; how we can ensure that companies like Pfizer don't drift away; and when will other science-based sectors start to engage, invest and employ.

Thomson Reuters 'Global Research Report: United Kingdom', published on 21 October, not only confirms the strength in depth of the UK's research base that we have reported in studies for the department of Business, Innovation Skills (BIS) but also finds that the UK's average research impact has now gone ahead of the USA. It has done so primarily because of exceptional research performance in life sciences.

There is no doubt that there is a universal and growing demand for innovative healthcare: more effective health systems in developed economies and affordable remedies in emerging economies. It is also evident that leading companies with an established reputation across the healthcare spectrum are increasingly constrained not only by finances but by their capacity to create new solutions. Some analysis is damning: John Martin, a professor at University College London and Yale University, suggested in Times Higher Education (29 September 2011) that UK 'pharmaceutical and biotechnology firms, the academy and the NHS all fall far short of their potential'. Yet this seems to be happening in an environment where the opposite should be true.

UK research is exceptional not only in performance but also in efficiency and effectiveness, achieving results with fewer resources than many other leading research economies. The UK spends 4% of the world's Gross Expenditure on R&D (GERD) on 6% of the world's researchers, according to OECD data, who are authors on 8% of the world's research articles and reviews indexed on Thomson Reuters Web of KnowledgeSM. These papers attract 11% of the world's citations and so create 14% of the world's top percentile of most highly cited output. Those exceptional UK articles include 17% of the world's research papers with more than 500 citations and 20% of those with more than 1000 citations. It is these highly cited papers that are linked to innovative products and processes and to Nobel prizes.

The UK's achievement is all the more impressive because it has sustained improvement in the face of growing international competition from Asia, much of that in material sciences but also now in biosciences as well.

If you want a highly competitive, knowledge-based economy founded on the strengths of your research-competent workforce then the UK is surely an attractive venue. In theory this outcome should bring industry flocking to feed at the innovation table. The problem is that the private sector is mostly missing.

In a report last year for Universities UK we recapped on the abysmal record of British industry in engaging with the science base. The Business Expenditure part of GERD is called BERD and, within BERD, the part invested in the HE sector is referred to as BE-HERD. This has not risen in line with growing UK achievement.

Data abstracted from the OECD MSTI database show that global BERD rose by around 80% in real terms over the period 1991 through 2008, from \$300 Bn to around \$550 Bn. Much of this rise was driven by the USA, but BERD in Germany also increased and BERD in China rose almost 20-fold as the research economy rapidly expanded. In the UK, by contrast, BERD actually contracted in cash terms into the mid-90s and then rose slowly through 2000 before leveling off recently. It fell throughout the period as a share of national wealth (GDP). Whereas it was close to the OECD average in 1991, it has since declined to around two-thirds of that benchmark. The US, Japan and Germany remain comfortably ahead of the average while BERD in China has now risen to match the UK figure.

Between 1995 and 2007, commercial R&D contract income to UK higher education rose from £170m to around £300m. But, at the same time, it fell as a share of total grant and contract income from about 11% to about 8%. In the last two years, even the value of research grants and contracts to leading research universities such as Cambridge and Oxford has fallen.

It is worrying that this commercial engagement has declined while the public research base has managed to turn itself around from the 1980s, when it was seen as being averse to getting too close to industry. Now, it is much more knowledge-savvy. And it is turning out increasing numbers of research-trained people. UK PhD output has increased to around 17,000 PhD awards per year, well ahead of France and closer to Germany (around 25,000 per year) than in the past. As a consequence of this growth in people output, OECD data show that the UK now has a significantly higher proportion of its workforce as research competent. The UK curve has risen from below to above OECD average, passing its main EU competitors on the way. The number of UK workers identified as researchers approximately doubled between 1991 and 2008 to reach around 250,000 people.

One sector that has consistently taken advantage of the knowledge resources – new ideas, highly trained people – that the UK offers has been pharmaceuticals.

Thomson Reuters data on corporate activity shows the extent of the inter-relationship between the university research base and pharmaceutical companies. Biomedical science companies employ 143,000 people and generate over £30 billion in turnover. Over the last ten years, the UK research base has been involved in more

biomedical sector deals, involving such things as drugs and devices, than any other country outside the USA. The UK has a similar number of clinical trials to Germany and Canada and more than Japan. Thomson Reuters Derwent Innovation Index shows that the UK has more pharmaceutical patent collaborations between universities and companies than any nation except the USA and Japan.

BIS analyses published on its R&D scoreboard, the annual report on the financial performance of UK and global corporate investors in R&D, show that there was more R&D performed in the pharmaceutical sector than any other, with expenditure in 2009 at £4.4 billion for in-house R&D, representing 28.4% of all UK in-house R&D spending. The Office of National Statistics' (ONS) analysis of UK BERD for 2009 shows pharmaceuticals way out ahead while only aerospace gets past £1.5 Bn, the motor industry

exceeds £1 billion and chemicals just stretches past £500 million. The pharmaceutical industry's R&D trajectory rose, up by one-third in cash terms between 2003 and 2008, while BERD for aerospace and telecommunications both fell.

Equally significant, the UK corporate sector accounts for around 10% of national biomedical research output. Around half of corporate authored research papers have an academic co-author, core to the part of the research base that makes UK biological sciences a world leader on impact. Web of Science data for 2001 to 2010 show that seven of the top 20 UK companies in terms of volume of research published belong to the pharmaceuticals & biotechnology sector, table 1. They are also companies that make the most significant investment in research according to BIS's 2010 R&D Scoreboard.

Table 1.

Company	Research papers	Sector	£M 2009 R&D
GlaxoSmithKline	5,062	Pharmaceuticals & biotechnology	3,629
AstraZeneca	2,817	Pharmaceuticals & biotechnology	2,746
Pfizer	1,741	Pharmaceuticals & biotechnology	326
Unilever	1,564	Food products	792
Qinetiq	1,056	Aerospace & defense	7.9
Syngenta	824	Chemicals	96
Merck & Co (Merck, Sharp & Dohme)	619	Pharmaceuticals & biotechnology	2
Eli Lilly	602	Pharmaceuticals & biotechnology	130
Novartis	572	Pharmaceuticals & biotechnology	90
British Telecom	538	Fixed line telecommunications	1,029
Rolls-Royce	435	Aerospace & defense	471
Johnson Matthey	382	Chemicals	87
Schlumberger	376	Oil equipment, services & distribution	497
Hewlett Packard	372	Technology hardware & equipment	36
Roche/ F Hoffman La Roche	327	Pharmaceuticals & biotechnology	208
Celltech Group	321	Support services	47
BP	273	Oil & gas producers	364

Why is the pattern of R&D engagement in pharmaceuticals & biotechnology not shown by physics, chemistry and technology based industries? Why has investment fallen in so many sectors? Of course the economy is a problem but, as the pharmaceutical sector clearly sees, where is competitiveness going to come from if not from innovation? The UK doesn't have a lack of innovative knowledge or a lack of talented people: it comes up trumps on both counts. There isn't a lack of university willingness to engage with companies: co-authorship with a spectrum of companies shows what academics are committed to doing and science park successes are widespread.

So why are we falling short of our potential? How can we boost pharmaceuticals and bring other industries into line? It is time for government to re-examine the tune it has allowed the DTI and BIS to play over the years. The UK's problem is not that it isn't good at seeing the relevance of ideas to money, nor that there is a lack of

'push' from the research base. What we need is a way of linking that to a corporate innovation 'pull'. That means focusing less on faults in the research base and more on enabling companies to acquire and use more high-end talent.

The challenge is risking recruitment when workforce budgets are tight. So what BIS can do is to develop new schemes to underwrite the recruitment of talented people into focused companies which demonstrate a strategy and willingness for innovation. That can only help strengthen our pharmaceutical base, persuade the doubters that the UK is still the place for R&D, and set an example for other sectors to watch and – hopefully – follow.

Thomson Reuters 'Global Research Report: United Kingdom' is available at: (<http://researchanalytics.thomsonreuters.com/grr/>)



About the BPS

With almost 3000 members, the British Pharmacological Society (BPS) is the primary learned society in the UK concerned with research into drugs and the way they work. Its members teach and carry out research in higher education, the pharmaceutical and biotechnology industries, hospitals, and health services. Many members play a key role in teaching medical students the principles of pharmacology, which underpin safe and effective prescribing in the NHS. Others are responsible for the clinical trials that translate new medicines from molecule to society.

Join us

If you are interested in networking with our members and strengthening our community, you should identify which of the individual categories you are eligible to apply for:

Member

For Pharmacologists and Clinical Pharmacologists.

Standard Tariff - £90

Associate Member

Open to individuals having a professional interest in pharmacology or a closely related subject who do not have the necessary qualifications to become Members.

Standard Tariff - £60

Postgraduate Member

Open to individuals studying for higher degrees in pharmacology, or closely related subjects. Also open to clinicians in training who have a specific interest, or intend to follow a career in clinical pharmacology.

Standard Tariff - £20

Undergraduate Member

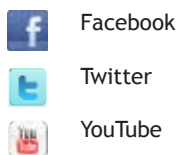
Open to individuals studying for degrees in pharmacology and other undergraduates whose courses include a substantial pharmacology component. Also open to medical students at any stage of training.

Standard Tariff - Free

Benefits

- free attendance to BPS scientific meetings including the Winter Meeting held in London in December
- enjoy access to the full online versions of the British Journal of Pharmacology and British Journal of Clinical Pharmacology
- become eligible for bursaries and travel grants to attend meetings in the UK and overseas
- apply for prestigious study awards and prizes: A J Clark Studentships; GSK Prize for Young Investigators
- receive regular editions of Pharmacology Matters, the BPS magazine
- opportunities to contribute to furthering pharmacology, across a range of activities, through the Society's committees, special interest groups and working parties

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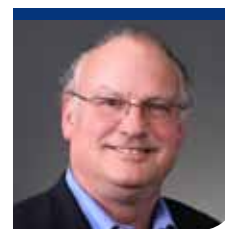


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“The future ain’t what it used to be” (Yogi Berra)



Richard Hargreaves
Merck Research Laboratories

Richard Hargreaves is Vice President, Worldwide Discovery Head Neuroscience and Ophthalmology, Merck Research Laboratories.

The R&D gamble has become a challenge to survive and succeed in an environment that has become more complicated and uncertain. Recently drug industry analysts and commentators have looked to major changes in industry structure and reduced research spending as a solution to the problems of the pharmaceutical industry. In contrast to the heady days of the 1980's and 1990's where promises of increased investment in research stimulated share prices, company stock prices today rise with announcements of research cuts. The bar for new medicines is high as the industry has delivered many excellent products that have had a significant impact on human health and are now available in generic form. The stock markets have now lost confidence that industry research today can deliver the returns that investors demand through the discovery of innovative medicines that have added value over generics through meaningful clinical differentiation. David Shaywitz (Director of Strategic and Commercial planning at Theravance San Francisco) recently commented (in review of a book called "Little Bets" by Peter Sims) that the pharmaceutical companies are "In search of a golden mean": a balance between exploration and execution in the context of opportunity and investment. He highlighted the need for perseverance to deliver on good new ideas through focused, well managed, determined execution on prioritized portfolios and the risks of disrupting innovation through constant experimentation with different research models to control costs and increase the return from investments in research. Indeed a recent 2011 report from the Economist Intelligence Unit entitled "The innovation imperative in biopharma" highlights the need to re-invent biopharma and develop new research strategies that are aligned with the economics of an evolving pharmaceutical market place. Dr Merv Turner from Merck commented that "For a long time the industry felt that the old model was going to deliver. We kept expecting the arrival of a blockbuster drug. Over time, because the failure rate and cost of development were so high, it has really forced the recognition that {the current situation} represents something more fundamental than just another cycle." Indeed it's certainly true that if innovation is too slow no position is defensible. The report concludes with some key lessons from innovators that we have to re-invent how to innovate rather than just cut costs and so need to get the "innovation environment" right by looking beyond internal R&D silos to pursue more open innovation, more biotechnology partnerships and greater integration with early space academic research to identify and validate new targets for drug discovery.

To quote Charles Darwin, ***"It is not the strongest of the species that survives, nor the most intelligent that survives but the one that is most adaptable to change"***. So how does this rapidly changing environment impact the human factors of getting a job and making a career in the

pharmaceutical industry? First, the industry is certainly re-sizing. It can no longer afford to be staffed and resourced at levels commensurate with peak research demands when flow in the discovery and development pipelines is unpredictable. Second, research models have to become more adaptable so that the ebb and flow of success and failure can be managed flexibly. Therefore, large pharmaceutical companies are shrinking their internal research footprints to concentrate on their "innovative core"-doing only what they can do – reducing headcount and moving work outside. Third, the industry was seduced by technology forgetting perhaps that it was only part of the innovation strategy and not a business strategy in itself and since many technologies have now become commodities there is no need for companies to maintain these capabilities and work can be sourced in high quality from the outside. As a consequence of these changes, the number of jobs in the contract research industry is growing rapidly. Contract research companies range from small specialized "boutique" companies in drug discovery that offer rare techniques and technologies to answer specific questions to "full service" chemistry and pharmacology companies such as those in the emerging economies of India and China that can run drug discovery programs on a fee for service basis. In addition there are large global organizations who conduct safety assessment toxicology studies and multinational clinical trial programs for drug registration on behalf of industry partners across the world.

What other changes influence where jobs will be in the future? The pharmaceutical company mindset is shifting from a closed environment of internal knowledge and local funding to a research model that leverages the world's knowledge through open source innovation and partnerships with academia and biotechnology companies to drive drug discovery pipelines. This shift is most apparent in the early space of drug discovery where industry is increasingly forming close collaborations with academia and venture capital backed research to fuel the identification and most importantly the validation of new drug targets. There is also increasingly a realization that the formation of pre-competitive consortia can be a highly effective way to generate new knowledge and share costs across companies, academia, non-profit and government research. Examples here are Massachusetts Life Sciences Center Neurosciences Consortium, Arch2POCM, the NIH Biomarker consortia and the Alzheimer's Disease Neuroimaging Initiative (ADNI). These early space initiatives and consortia will undoubtedly open new opportunities enabling more academic scientists to work together with industry to pressure test their ideas and translate their innovation into medical breakthroughs.

Paul Matthews, Head of Imaging at GSK recently commented that a fundamentally optimistic alternative future scenario to cost cutting and reorganization is embracing the idea that drug discovery and development can be made better by becoming smarter. The paradigm of drug development is undoubtedly changing with a shift towards science based biomarker strategies and a greater

emphasis on translational medical science. Indeed in an article arguing for a greater role for experimental medicine in the early evaluation of drug candidates Garrett Fitzgerald, quoting Tancredi in the *Leopard*, said "if things are going to stay as they are, things will have to change". Biomarkers help ensure that clinical proof of concept testing focuses on the best hypotheses and molecules by proving biological mechanism, target engagement and pharmacodynamics to select the right mechanisms, molecules and doses for large late stage expensive clinical trials. The goal of an aggressive use of translational biomarker strategies especially those (toxicological, genetic, biochemical and imaging) that can bridge the laboratory to the clinic is to reduce late stage failure in drug discovery. In the USA, Francis Collins, Director of the National Institutes of Health (NIH), has proposed establishing a new National Centre for Advancing Translational Sciences (NCATS) to the Federal government. The goal of this centre is to support the development of innovative methods and technologies that could streamline the process of diagnostics and therapeutics development. NCATS will also oversee the Clinical and Translational Science Awards (CTSA) program, and facilitate collaborations between government, academia, industry, venture capitalists, non-profit and community organizations. The growth in the use of translational biomarkers and the dawn of centers such as NCATS holds the bold promise to increase success rates in drug discovery and development. The widespread implementation of this translational strategy should increase scientific opportunities broadly across the biomedical research network.

Competition for jobs within today's pharmaceutical industry is intense. As company research portfolios are prioritized, to invest only in disease areas where each considers they can generate true medical advances and gain a sustainable competitive advantage, there is an increasing need for highly trained scientists with deep subject matter expertise and technical excellence aligned with each company's goals. So what qualities do the companies look for in

their scientists and what do the scientists think are the most important attributes of the companies they work for? These were nicely summarized in a recent 2011 Science/AAAS survey (www.sciencecareers.org). First, the scientists, people who really want to make things happen and translate biology into medicine, need perseverance, ingenuity and enthusiasm, to enjoy uncertainty, are prepared to fail but to learn from mistakes, have the courage to take prudent risks by floating new ideas or trying something new, challenge the status quo with good humor and have well developed communication and collaboration skills. Moreover, pharmaceutical company scientists today need more than ever before to excel in the context of both internal and external research environments. These personal attributes are needed for a job where failure not success is often the norm, as captured by Roy Vagelos (former President Merck Research Laboratories and former Merck CEO) who said "In the life of each drug-development project, there is always a crisis, a moment when it looked like years of research will go down the drain and the drug will never come to market. There are a million ways to fail in this business. We scientists flirt with each and every one."

So what about the future? People, skills and culture will always be the keys to success. Research in the companies may be smaller and jobs fewer but changing research and development strategies will open new opportunities for employment in different biopharmaceutical sectors worldwide. Despite all the changes, the best pharmaceutical companies offer environments for continuous innovation and outstanding research in the context of corporate cultures that value social responsibility, loyalty and respect and so are still terrific places to work. We need to inspire the next generation of scientists, champion science in high schools, focus and fund training in the core disciplines of drug discovery to produce outstanding researchers whose passion is the discovery of new medicines that have an impact on human health worldwide.

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The domino that 'downgrades' the PhD



Nikolas Dietsis
YP Committee member

Nikolas studied Neuropharmacology and Molecular Pharmacology (BSc, MRes, Ph.D) and his scientific interests include GPCR pharmacology and the effect of receptor dimerisation on drug action. He has been awarded the 2010 Schachter Award and the 2009 Bain Memorial Bursary Fund Award by the BPS. Nikolas has been an active member of the Young Pharmacologists Committee of the BPS since 2010, and regularly blogs on the BPS e-community site under the title 'PharmacobLOGology'

Motivation and career paths for Pharmacologists

If we could ask every doctoral pharmacology-student in the UK the question 'why did you start your PhD degree?', I am pretty sure that most answers will fit in one or more of the following: 1) I have a passion for pharmacology research, 2) I want to work in academia, and 3) Because I want a better-paid job. I am sure that if I was to be asked the same question when I first started my PhD, I would have answered all of the above without hesitation. Having said that, if I was to be asked the same question today, living the painfully-slow and energy-consuming situation of trying to find a pharmacology job, I would definitely have to reconsider my answer.

It is true that being a pharmacologist nowadays gives you a broad range of career paths of which you can choose from. Working as a researcher in the academia or a research institute, teaching at a University or a College, experimenting in industrial laboratories, working in forensics, being part of a clinical research team, being a science writer, working in pharmaceutical sales or pharmacovigilance, are only some of a myriad of different work settings that pharmacologists can enjoy.

One would argue that having a PhD in Pharmacology certainly adds a considerable 'weight' to your CV when applying for these jobs. However, the availability of such a variety of career paths is hardly an indication of the ease of employment, even with a PhD degree. To the contrary, I'd say. Looking at the pharmacology jobs that have been generated during the last twenty years, it seems that the diversity of these jobs is directly proportional to specific knowledge, training and skills required by the employers. In short, the more specific a job title gets the more specific the criteria becomes for employers.

Take for example some of the job titles that are currently available in the market: *in vivo* pharmacologist, 'a pharmacokineticist and a cell-signaling pharmacologist' are only a few examples of jobs that are targeted to pharmacologists that have been trained (or have experience in) specific techniques and assays, not to mention the fact that a PhD degree is increasingly included as an 'essential requirement' in job descriptions.

Beware of Supply and Demand

A basic factor that affects pharmacology graduates finding the right job is the logarithmic increase of PhD-qualified pharmacologists coming out from UK universities. The universal law of 'supply and

demand' applies here too, as it does to every other part of our society; the more PhD-qualified researchers are produced (supply), the larger the pool of candidates for an employer to choose from. Employers then 'raise the bar' for a given post and screen for candidates in a much deeper and narrower level, either desiring training in specific techniques or looking for candidates that have more experience (demand).

The fact that there is no apparent increase in the number of pharmacology jobs available coupled with an increase in PhD-qualified pharmacologists, transforms the job market into a more 'specialized' and 'demanding' one.

An expected consequence?

When I started my BSc in Pharmacology, thirteen years ago, a graduate with a good BSc (Hons) in Pharmacology used to be able to find a job in the pharmaceutical industry sector reasonably fast. Needless to say that at that time, having a PhD in Biomedical Sciences meant that not only your career aspirations were mainly focused on academia, but finding a permanent job in a university was pretty straightforward too. The employment market used to be crystal clear: a graduate or postgraduate would prefer to shift towards industry, whereas a doctoral graduate would shift towards academia. Both sectors had a specific pool of employees to choose from, with similar training and skills.

However, the balance started shifting when numbers of postgraduates with a Master's degree in Pharmacology increased notably and most employers added a postgraduate qualification under the 'essential criteria' section of their vacancies, without any apparent change in the responsibilities or benefits of these posts compared to the ones available before.

This change has pushed more and more graduate students in the following years towards a postgraduate qualification, before searching for employment. This has caused the employment market (mainly industry) to become saturated with people with an array of postgraduate qualifications. Subsequently, the increase in the number of postgraduates has affected the PhD itself and a domino-like reaction of this kind has led to the situation that we are in today; highly specific job requirements, highly-specific selection criteria, not enough jobs, overload of PhD graduates.

The situation is not unique to pharmacology it crosses the spectrum of Health Sciences. Although pharmacology, as an independent, defined, specific and multiconcept scientific area, is a fairly 'young' subject compared to Biology or Physiology, all biomedical science areas suffer the same consequences when it comes to science employment and career path choices.

The numbers behind the current problem

According to an article in *The Economist* magazine (16/12/2010) entitled "The disposable academic", US Universities have led

the story, between 1998 and 2006 the annual output of PhD graduates has doubled to 64,000 per year! The story is similar in the UK and other European countries, with proportionally increasing numbers over the same period. Doctorates awarded increased by 40% in all Organization for Economic Co-operation and Development (OECD) countries (1) with Japan leading the way with an increase of 46% within this eight year period. And, of course, the OECD has recognized the problem: in its 2010 "Science, Technology and Industry Outlook", it acknowledged that employment conditions and career paths of researchers has been deeply affected by changes in their international labour market. It stated that "the growing number of temporary contracts in Universities and public research institutes has led to the emergence of a 'secondary' labour market where lack of clear rules on recruitment, employment and promotion may lead to job insecurity and inequity".

The Economist article goes on to say that although some of this growth reflects genuine employment demands by the expansion of higher education institutions, the Universities are not bothered by this situation as PhD students are cheap, highly motivated labour. It seems that a shortage in permanent academic jobs and an increase in PhD graduates is the main factor for the current increase in postdoctoral researchers. Of course, an employment scheme where a University has more postdoctoral researchers than lecturers, with their short contracts and high qualifications, is not only cost-effective for the institution but also research-productive, as they do the most research work. No wonder *The Economist* refers to postdocs as "the ugly underbelly of academia".

The domino goes on

So where are we now? It is very clear already, that the domino continues even today, with no actions taken whatsoever. With a saturated PhD-qualified employment market already in a crisis and a current push towards postdoctoral research for those heading to academia (it is widely believed that the postdoc has been invented to relieve the 'unemployment pressure' of too many PhD graduates before hitting academia).

Nowadays, most academics with permanent jobs have passed through at least two or three postdoctoral contracts (not years) before securing their permanent job. The saturation in postdoctoral market has already started. Doing a simple search at the academic-orientated website (jobs.ac.uk), it becomes clear that nearly half of the pharmacology postdoctoral vacancies available mention that two or three year's postdoctoral experience is highly desirable. We are not far from when postdoctoral experience will no longer be "desirable" but "essential" for most postdoctoral jobs in biological sciences. And when this happens to academia the situation will diffuse to industrial jobs too; as evidenced by PhD degrees these past ten years.

Government policy

In April 2011, *Nature* published a specialized issue on the future of the PhD (472:259-384), with the editorial and various articles urging for a "restructuring of the PhD programme", "fixing the PhD" problem, or wondering if "it was time to stop producing more PhDs than ever before". But, if the research-employment market is saturated with PhD graduates and postdoctoral posts, why do students seem to pour themselves into the research "mill"? As an article in *Nature* argued, "it seems that governments are convinced that higher education and scientific research are the key to economic growth and prosperity". However, their efforts for

creating more scientific jobs and producing a variety of employment settings, is often capped by a lack of real scientific understanding. When science policy-makers are often not scientists, it is no wonder choices in research employment policies have led us here.

Is the PhD the problem?

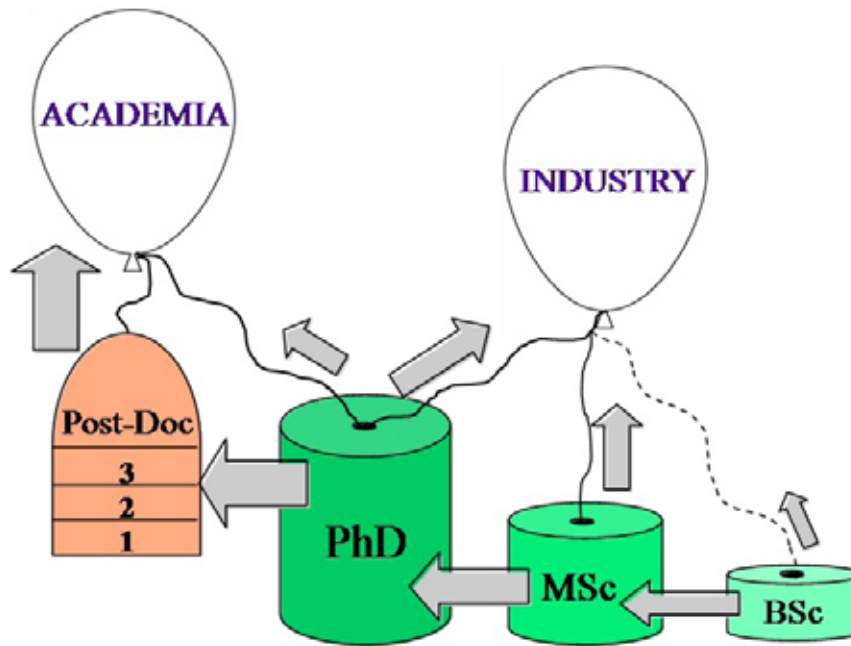
At the recent BPS workshop on PhD standards (15 April 2011), representatives of the Organization for PhD Education for Biomedicine and Health Sciences in the European System (ORPHEUS) presented the PhD standards they had developed. Although these discussions are invaluable for the development and future of the PhD, I wonder if the PhD itself is the source of the problem or even a part of the problem. Will it help if we restructure our PhD degrees, or if we add more regulations and standards? I believe not. I offer one simple argument for this, a simple example that shows the structure and quality of the PhD programme is not part of the problem we are facing today. The American PhD is completely different to that in Europe. In the US an average PhD degree lasts seven years and it can often go up to 10 years, in contrast with a European PhD which lasts between three to four years. The massive difference in programme length between the two continents is underlined by marked differences in all aspects of the PhD, including the teaching responsibilities, skills training, supervision, thesis assessment, admission requirements, form of examination etc. But, despite the differences between the continents PhD programmes, job insecurity, overproduction of researchers, and constant reform of the science-employment market prevails on both continents. In the US in particular, PhD completion rates for doctoral students are only 57% within ten years of starting. An extremely lengthy programme combined with bleak job prospects and underestimated salaries may well bring you to the limits of your patience. The result is that nearly half of their doctoral students abandon their studies half way. If I wanted to be mean, I'd say that the US system is deliberately designed to winnow and filter out excessive influxes of PhD students, protecting the science (or academic) employment market from overloading. If this was the case, it is clearly failing.

The responsibility of the Big Four

An interesting article was published in August's *Pharmacology Matters* entitled "Safeguarding the PhD". Professors M. Mulvaney and N. Goulding write that one of the moves to safeguard the future of the PhD is "to strengthen career opportunities for those with PhD degrees". This is the heart of the problem. In the US for example, nearly 100,000 doctoral degrees were awarded between 2005 and 2009, but there were only 16,000 professorships. The same story is reflected across Europe, with the only exception worldwide being Brazil and China - where there are currently shortages of PhD graduates. It is clearly a global problem there are simply not enough jobs generated to cover the huge increase in PhD production.

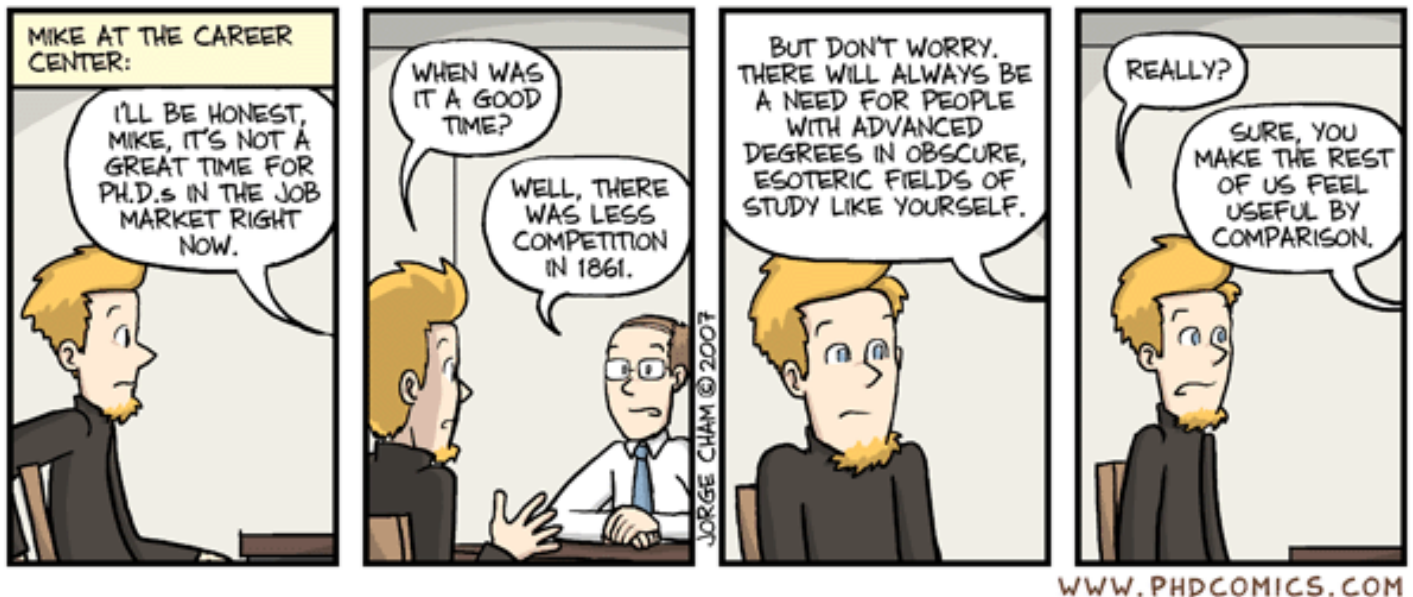
In my opinion the 'shortsighted' strategies of the Big Four: government; science policy-makers; research-employers; and academic institutions, who have all looked to their own interests over the years, ignoring the interests of researchers, the actual science 'work force'. It appears that this is a convenient time for them: the institutions enjoy cheap labour, the industry uses highly experienced employees with 'low-as-possible' wages, the governments enjoy the fruits of 'growth' and everyone is happy. Perhaps the rise of unemployment in science, overproduction of science qualifications and job insecurity is not a 'priority' at the moment.

Figure 1.



Diffusion of scientists (grey arrows) in the employment market. The larger the arrows, the greater & faster the diffusion. Industry vacancies accept medium influx of scientists from non-doctoral qualifications, in contrast to those with a PhD. For accessing the academic sector, PhD graduates have to use the intermediate steps of a number of postdoctoral posts; although this has become a considerable 'burden' to the 'weight' that academic vacancies can bear. In order to avoid overloading the academic and industrial 'vacancy-balloons', more (and diverse) jobs must be generated, instead of trying to invent ways to reduce the PhD graduate 'barrel'.

Figure 2.



"Piled Higher and Deeper", by Jorge Cham (www.phdcomics.com)

The Vital Role of Technicians



Dr Mark Downs
CEO, Society of Biology

Mark joined the Society of Biology as CEO from the major charity for hearing health and deafness, RNID, where he was the Executive director for Science and Enterprise (2004-2009) leading a major retail operation, service deliver social enterprise and the biomedical and technology research programme.

Mark joined RNID after spending three years as the UK's lead policy official for negotiating and implementing a range of far reaching, EU driven, business related environmental legislation at the Department of Trade and Industry. He previously spent five years at the British Embassy in Tokyo as First Secretary (Trade Policy) with responsibility for all UK-Japan bilateral and multilateral trade relations. He focused, in particular, on the medical, environmental, telecommunications and legal services markets.

Earlier in his career, Mark managed and undertook biosensor research, managed Government LINK programmes and worked on innovation and S&T policy. He was responsible for setting up the Government's Faraday Partnership Programme and worked on the 1993 Science & Technology White Paper. He has a PhD from Cranfield University where he worked on the development of DNA sensors for rapid gene identification and a BSc in Biotechnology from the University of London.

The Society of Biology is the UK's single voice for biology, representing over 80,000 biologists through its individual and organisational membership.

Technicians are the unsung heroes of many science based organizations, but their contribution is beyond question. They often have unique skills and expertise that underpin the ability of companies, schools, the NHS and universities to perform their roles successfully. It is not easy to define the term "technician," as the Technician Council rapidly discovered after its inception in early 2010. The range of biology-based technicians is enormous covering general and clinical microbiology, animal husbandry, plant science, ecology and healthcare; the list is almost endless.

There has been concern for some time, that intermediate level scientists (for example new graduates) and technicians do not have clear career progression routes. There is also a sense that they lack the status of others within the science sector. These individuals support vital research, teaching and contract work, but are usually ineligible to apply for Chartered Biologist or Chartered Scientist status.

To try to address this, the Science Council, whose Board I joined last year, is currently developing a new registration scheme for technicians and intermediate level scientists. This scheme aims to raise the profile of technicians and to support a number of initiatives which will enhance learning and development opportunities. Stakeholders throughout the science community will contribute to the development of the scheme and registration criteria.

The Society of Biology is committed to the success of this registration scheme; biology is the most diverse of the sciences, and bioscience technicians work in vastly different disciplines and roles. The register will give technicians working in different fields a new shared sense of identity, and provide a much-needed method to assess and recognize competence across a professional range that is perhaps broader than within other science subjects. Registration will enable us to work with partners to deliver more consistent advice and guidance about development opportunities, to share good practice, and to gather better data about the sector.

The Society of Biology already manages several professional Registers: the UK Register of Toxicologists; the International Register of Fetal Morphologists, and the Register of Eligibility for Qualified Persons. These Registers are highly valued by members - they formally identify levels of competence and expertise, which are difficult to evidence by other means - and also by the industries and regulators of the relevant sectors they represent, as they support confidence and reassurance in the data that Register members generate and their interpretation of it.

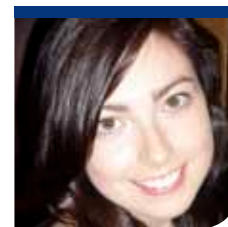
I am delighted to say that the Gatsby Charitable Trust has agreed to support us in this endeavour. Over the next two years we will develop and firmly embed a system that will enable technicians and intermediate level scientists in the biological sciences to become early participants in the Science Council's new registration framework. We hope this will help increase their status alongside the opportunity to offer better co-ordinated and rigorous continuing professional development.

In a structure that is very similar to Chartered Scientist, we envisage that the Science Council will issue registration licences to competent bodies which will in turn offer and manage professional registers. Wearing our hat as an umbrella organization for the learned society sector across biology, we hope to offer the opportunity for any biology technician to join, working with our members to promote the benefits and opportunities this should bring. Timescales are not yet fixed but after wide consultation in the spring, we will aim to launch the pilot programme as soon as possible in 2012.

In parallel, the NHS is looking at ways to develop the NHS career framework through its "Modernising Scientific Workforce in the UK" initiative. This will include the work of many technicians and the associated training and education needed to support them professionally. In looking at the Technician's Register we will seek to work closely with the NHS to ensure as much synergy as possible.

Professional registers and the inherent responsibilities for their membership to abide by a code of conduct, including continuing professional development, have been a part of the historic career landscape for many of the professions. This new initiative alongside broader work on apprenticeships and sector skills gaps is set to be a major area of work for all professional bodies over the next five years and the Society of Biology is keen to take an early leadership role for biology.

News from the Young Pharmacologists



Hannah Watson
Young Pharmacologists Representative

2011 is proving an exciting year for the Young Pharmacologists' Committee! We are working as hard as ever to be involved in the pharmacology community and have already begun planning how to make our mark in 2012.

The Twelfth International Conference on Endothelin 2011

As anticipated, this event was a great success! The conference was held in September of this year in Clare College, Cambridge, UK. It was attended by an international audience and drew much acclaim. Thank you to all those who helped make this such a memorable event.



The cakes went down well!



and in second place!



PHARMACOLOGY

BPS Young Pharmacologists Society invite you to a night of fun this Winter meeting, featuring a pub quiz with prizes to the winning team, and other assorted Christmas treats!

13 December, 19:45

The Tattershall Castle, Victoria Embankment

Student members: £5 (£10 non-student members)

Includes buffet and entertainment
Tickets are available through the online registration system - see www.bps.ac.uk for details

BPS Winter Meeting 2011

The annual meeting will take place from the 13-15 December 2011 in the prestigious Queen Elizabeth II Conference Centre, London. Our Scientific Symposium: 'Stem cells: Pharmacology and Therapeutics' is coming together in perfect time. With Professor Doris Taylor confirmed as our key note speaker the symposium is already building excitement. As always, the Young Pharmacologists will be hosting the ever-popular networking event that will be held in conjunction with the Winter Meeting. Check out the meeting website for up to the minute information!

Undergraduate Bursaries for the BPS Winter Meeting 2011

For those in the science community, this is an event not to be missed. The BPS recognizes this is an inspiring meeting for students to attend and as such are providing Undergraduate Bursaries for those presenting at the event.

IUPHAR 2014

Although not for several years yet, we are already getting excited! It will be held in South Africa and we aim to help fund bursaries to enable African scientists to attend the event. We are already fundraising and have raised over £1200 for this cause. We are passionate about continuing this endeavour and with the time frame left for further fundraising, we are confident of achieving great things! If you too would like to help such a fantastic cause then we are selling "I love pharmacology" t-shirts at all BPS events. T-shirts are just £5 with the proceeds going towards the bursaries for IUPHAR 2014. If you would like a t-shirt please contact the BPS office.

If there are any queries on events or bursaries please do not hesitate to contact Hazel O'Mullan (hom@bps.ac.uk).

Education update

Jess Strangward
Head of Education



Firstly and most importantly I would like to thank everyone, staff, members of the BPS, and the education departments at other societies for helping me through my first two months - from long chats about your visions for the society and copious cups of tea, it all helped me settle in very quickly. I hope I can forge forward with Annie's legacy and help the educational heart of BPS continue to beat fiercely.

Education, education, education is a mantra that is entrenched at BPS, it is at the heart of everything we do. But recently I've been pondering (not in committee meetings I promise) what education means to different people and, in this brave new world of fees changes, the value of it. To some education is knowledge for its own sake, to students, they want a guarantee that their education will fast track them to employment, while employers want graduates with specific skills so they are work ready. Then, as workers progress through their career they want to ensure they continue to enhance their learning. Beyond this, our members the BPS wants to 'educate' the public and government about the importance of pharmacology whilst reaching out to the younger generation.

At the centre of all these discussions is pharmacology at universities. There were rumours that grew to whispers that became discussions about where pharmacology as a discipline is heading. Over the next year we need to hear from you about your experiences of this. Pharmacology's ability to weave itself throughout so many disciplines could explain its 'everywhere and nowhere' status. Coupled to the discipline is the concern about *in vivo* skills - it's something that employers both in industry and academia need but universities struggle to provide due to class sizes and the high cost of animal work. *In vivo* is unique as it requires not only a thorough mind and exact planning but intense manual skill. With the introduction of the European directive and the Society of Biology's Accreditation of *in vivo* courses and dwindling sponsorship from industry, the stage is set for BPS to lead a discussion about the future landscape of *in vivo* training for future drug discoverers.

I believe the suite of educational activities that the BPS have and are continuing to develop, reach out to all these groups.

Prescribe: Open for business

The Prescribing Skills Assessment (PSA) continues apace. The team trained up a score of question writers in September who will reconvene in spring to peer review the bank of questions that selected Medical School students will sit in the summer. A huge thank you to the writers who gave up their time to make this endeavor such a success. To complement this, BPS is now making the Prescribe e-learning platform available to all interested medical schools. This will enable students to learn and test themselves on pharmacological principles in tasty bite sized chunks.

Society of Biology (SB) Accreditation

A meeting on the 17 October looked beyond the pilot and asked members what other courses they would like to see accredited. It also gave members and interested parties the chance to question the SB steering panel about their vision for accreditation and why they chose to focus on specific disciplines rather than a general life sciences accreditation. The Government asked the SB to help produce the next generation of scientists that wouldn't simply regurgitate basic facts but could use their knowledge to build and embark on thoughtful experiments and know how to analyse the data. While we won't know

the outcomes of the pilot *in vivo* accredited courses until March 2012 we are continuing to work closely with the Society of Biology to ensure our voice is heard.

Pharmacology NOW

One of the most exciting projects I inherited from Annie was the new BPS leaflets (figures 1 and 2) and soon they'll be hot off the press. They are best described as dizygotic twins, definitely with the same parent but with their own unique personalities. *How do Drugs Work?* is a whirlwind tour through the history of drug discovery, how pills affect our bodies and where pharmacologists get ideas for drugs from. *Careers in Pharmacology* contains a wide range of case studies from people in the field: clinical, basic and industrial. Thank you to everyone involved we hope you like them and we are looking forward to our inboxes flooding with your requests to distribute them far and wide.

in vivo

BPS continued to fund many different *in vivo* training initiatives over the past year: training courses for undergraduates as well as the ever popular short courses (run in conjunction with the Physiological Society) that help students from universities that don't offer *in vivo* opportunities. The IPF fund continues to provide vital support to *in vivo* PhD students but going forward will expand its remit to Masters students and soon, undergraduate animal projects.

To boldly go...

BPS is taking its first few steps into the schools arena. We have always supported and encouraged members to engage with schools but we are now going to offer (on our new website) a range of resources for teachers and students that will complement the curriculum. The first stage of this is turning Julie Keeble's, King's College, highly successful 'Drug Discovery' Workshop into handy teacher packs. To galvanise and help members engage with these audiences more we are offering a number of grants for 2013:

1. Up to £500 for an outreach event hosted at a school, festival or your institution
2. Young pharmacologists: small travel grants to attend careers fairs
3. Teachers: to help buy the consumables to run our drug discovery day

The forms and terms and conditions will be on the website and we look forward to reading your ideas.

Diploma

There have been six new diploma sign ups since the August edition who nearly all attended the new Enzymes Workshop. The feedback was very positive and we heartily thank the speakers for their efforts. Back by popular demand the GART workshop is running in association with the Winter Meeting. We have an exciting schedule in the pipeline for next year - from Statistics to Safety Pharmacology. Becky Hughes and I are happy to see that many diploma students who were affected by job losses this year are back on track.

Whatever stage you are in your pharmacology career - or if you are unsure you're destined for pharmacology yet - the BPS has something for you.

Thanks and over to David Webb!



Robin Hiley
Vice-President Meetings

The Vice-President Meetings of the Society has a great deal of fun, there is a scientific programme to deliver backed up by a generous budget. The Society aims to deliver five or six meetings a year, including the Winter Meeting, and works with other national and international societies to allow pharmacologists and scientists working in related fields to present their latest findings. Over the last few years a new pattern has emerged in the programme. Sometimes meetings focus on a specialized field, such as a single aspect of cell signalling (this summer, a meeting on cyclic AMP in the context of inflammation) or a new group of therapeutic molecules (September saw an Industry Committee-organized meeting on Biologics). Others, such as the Winter Meeting or the four-yearly meetings of IUPHAR and EPHAR (which are usually strongly supported by the BPS), are a mix of specialized symposia, plenary lectures highlighting the work of leaders in pharmacology, and free communications sessions for new work. These free communications are vital to the health of the discipline as they are often presented by postgraduates who will be the leaders of our discipline in the future. Seeing all this unfold has been every bit as challenging and exciting as I thought it would be when I was elected to the role three years ago.

One of the first things I discovered was that for the first couple of years of office, the job is to deliver the meetings developed by your predecessor. This is a welcome task as it forces you to look at the current state of pharmacology through another's eyes. From Mandy Maclean, I inherited a great programme of symposia and meetings on new technologies and novel developments, especially in cardiovascular and respiratory pharmacology. Also in good health was a series of Focused Meetings on Cell signalling held at Leicester. The meeting in 2009 was one of the first I attended as VP, and I am pleased that next year will see the fourth in this series.

The concepts behind the Leicester meeting, and a planned James Black meeting on platelets, led the Meetings Committee to put together a new strategy. Summer general meetings were suffering a fall in attendance. Symposia, with first rate topics and speakers, were getting disappointingly low attendance. So it was decided to have one general meeting a year, in December, and several smaller meetings throughout the year in which younger scientists could mix closely with the leaders in their fields, exchanging results and ideas. Focused meetings would be larger (80 - 150 attendees) than James Black meetings (up to 80 delegates with a higher ratio of senior to junior scientists). It was also aimed to minimize the number of nights that people would have to spend away from the bench, without reducing informal interaction, by starting meetings later in the day but retaining poster and social sessions. This meant that special care had to be put into choice of venue - it had to be easily accessible from across the UK, Ireland and further afield.

This summer saw this policy begin to take form. Our President Emeritus, Jeff Aronson, organized a James Black Meeting on

the future of Clinical Pharmacology. This was held in Oxford, with support from Green Templeton College, and attracted a small but enthusiastic group - as intended for this meeting series. Members left with an agenda for the development and support of Clinical Pharmacology within the UK. The QEII Conference Centre welcomed a Focused Meeting entitled *Novel cAMP signalling paradigms: New insights into the development and progression of chronic inflammatory diseases* organized by Martina Schmidt (Groningen). This attracted members and other delegates from across Europe (though attendance from London itself was mysteriously low). Starting after lunch, the meeting featured talks by Miles Houslay (Glasgow), Paul Insel (California), Dermot Cooper (Cambridge), Enno Klussmann (Berlin), Frank Lezoulalc'h (Toulouse) and Richard Bond (Houston) among others. The meeting finished in the afternoon of the second day, but still included a busy poster session and a convivial conference dinner. Feedback was very positive and this is especially welcome as this was the first delivered by our new meetings team, Karen Schlaegel and Becky Hughes.

September saw two other smaller meetings. Martin Todd and the BPS Industry Committee launched their programme with a James Black meeting on *Drug Discovery for the New Millennium: Riding the Biological Wave*. This was well attended from industrial laboratories but there were surprisingly few from academic laboratories in view of the new opportunities biologicals offer for therapeutics in the near future. The potential was illustrated by talks about the molecules that are now well established in therapeutics. Speakers included Greg Winter (MRC Cambridge), Iain Chessell (Medimmune, Cambridge) and Stephen Holgate (Southampton) and topics ranged from asthma, through diabetes and rheumatoid arthritis to cancer. Many of those attending were not BPS members, but Martin made a clear case that the Society was the place to gather for those with an interest in any form of therapeutic molecule.

Just a few days earlier, Clare College Cambridge hosted the *12th International Conference on Endothelin*, organized by Anthony Davenport and Matthias Barton. Many stars of the field attended, including Masashi Yanagisawa (Dallas), the discoverer of the peptide, and the doyen of endothelial pharmacology, Paul Vanhoutte (Hong Kong). A packed lecture theatre and poster sessions showed that this field is still very lively and among the established workers in the field were many newly-established investigators who were able to see what the BPS could offer them in their careers.

The American Physiological Society was a partner in this meeting, and the involvement of sister societies is another strand that we have tried to strengthen in our meetings. Next year sees us partner the Physiological Society in a meeting on Elite Performance, planned to take account of interest in the London Olympics, and 2012 also sees us collaborating in the EPHAR meeting in Granada. Further out we shall be guests of ASPET in the Experimental Biology Meeting

in 2013 and we are discussing with our Australasian colleagues in ASCEPT the possibility of a joint Pacific area meeting aimed at countries developing pharmacological expertise. I am also pleased that there will be two meetings in Ireland next year as this is very much part of the Society's 'patch'.

I hand over this great position to David Webb of the University of Edinburgh. I hope he enjoys the meetings that are planned as much

as I did those put in place by Mandy MacLean. I wish him and the Meetings Committee great success in developing the meetings programme from now on. I must end with a heartfelt thanks to the staff at Angel Gate who have been committed to making sure these events happen. There have been many changes in the last three years but all I have worked with have given me all the support I could wish for. We are fortunate to have such a group of great professionals supporting the officers and members of the Society.



Delegates pose during James Black: Planning a 5-year Agenda for UK Clinical Pharmacology



James Black: Biologics for the New Millennium



Harry Potter style dining at the Twelfth International Conference on Endothelin

Prescribe e-learning

BPS Launch Beta Site Offering Free Access to UK Medical Students

Jonathan Brüün
Director of Communications and
Business Development



Many of our members, and indeed many from outside of the BPS, will have followed progress of the Prescribe project with interest over recent years.

Prescribe is an e-learning resource to help medical students (and students of other healthcare professions) develop a firm grounding in the principles of basic and clinical pharmacology, which underpin safe and effective prescribing in the NHS.

The project, which began life as a partnership with the Department of Health's e-Learning for Health (e-LfH) initiative, has been supported by the BPS over the last year following the withdrawal of funding from the e-LfH scheme. We're therefore delighted to tell readers of *Pharmacology Matters* that, as a result of this support, BPS has been able to launch a new online platform featuring 15 e-learning sessions covering pharmacodynamics and pharmacokinetics, and a range of other resources. The site can be accessed at: (www.prescribe.ac.uk).

The new website, which is a beta version of a much larger resource planned for development over coming years, may now be accessed free of charge by students and members of staff from medical schools across the UK and Ireland.

Professor Simon Maxwell, *Prescribe* Clinical Lead, highlights the options:

"There are a small but growing number of sessions available to users of the site. Each session has a series of learning objectives, pages of information with dynamic illustrations, and regular knowledge checks to test the user's growing understanding of the subject.

"We've built the site on a learning management system, so users can keep a record of their progress through the sessions. We've also included a range of other resources such as a library, a glossary and links to further learning.

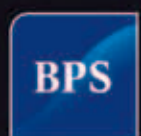
"The intention is that this relatively limited beta site will be tested over the coming year, and will form the basis for a much more comprehensive resource which will be available for years to come."

Students from medical schools in the UK and Ireland can register for *Prescribe* without charge, and we would encourage you to share this information with your colleagues or students. To register, simply follow the links at (www.prescribe.ac.uk).



Prescribe

e-Learning for Clinical Pharmacology & Prescribing



BRITISH
PHARMACOLOGICAL
SOCIETY

Today's science, tomorrow's medicines

Winter Meeting, London 2011
Queen Elizabeth II Conference Centre
Wednesday 14 December

Stem cells: Pharmacology and therapeutics

Organizers:

Young Pharmacologists' Committee

e: meetings@bps.ac.uk
w: www.bps.ac.uk
t: 020 7239 0176

Programme

9:00 – 9:15	Introduction to stem cells in pharmacology <i>Professor Sian Harding, Imperial College London, UK</i>
9:15 – 9:35	Pharmacological mobilisation of endogenous stem cells <i>Professor Sara Rankin, Imperial College London, UK</i>
9:35 – 9:55	Stem cells in drug safety testing <i>Dr Chris Goldring, University of Liverpool, UK</i>
9:55 – 10:15	Stem cells and regeneration of conducting airways <i>Dr Sally Dickinson, University of Bristol, UK</i>
10:15 – 10:30	Selected Abstract from the Young Members Section
10:30 – 10:50	Coffee break
10:50 – 11:00	Stem cells and pattern recognition receptors <i>Mr Daniel Reed, Imperial College London, UK</i>
11:00 – 11:20	Studying neuroprotection using human stem cell-derived neurons <i>Professor Giles Hardingham, University of Edinburgh, UK</i>
11:20 – 12:00	Engineering Cell Based Solutions for Cardiovascular Diseases <i>Professor Doris Taylor, University of Minnesota, USA</i>

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or
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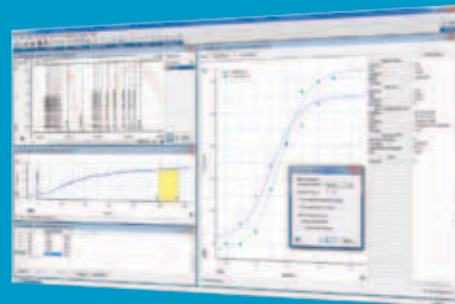
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