Pharmacology Matters

BRITISH PHARMACOLOGICAL SOCIETY
Today's science, tomorrow's medicines

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European Pharmacology

EPHAR 2012

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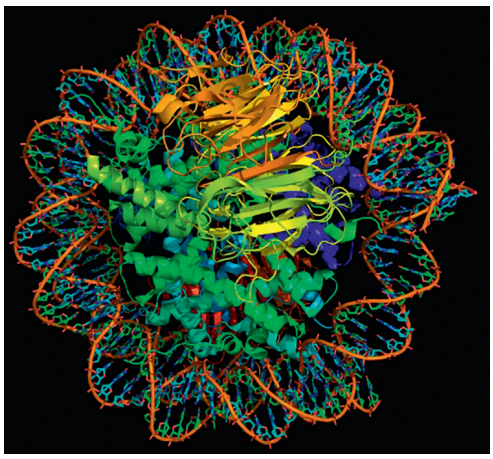
Biochemical Society
Advancing Molecular Bioscience

11–13 December 2012
University of Leeds, UK

DEADLINES:
Abstract submission 9 OCTOBER 2012
Earlybird registration 12 NOVEMBER 2012

The Biochemical Society Annual Symposium

Epigenetic mechanisms in development and disease



Organizers:

Adele Murrell
Paul Hurd
Ian Wood

Overview:

Epigenetic mechanisms play pivotal roles in development, differentiation and cell identity. Epigenetic regulation is influenced by environmental factors such as nutrition, and inappropriate epigenetic regulation contributes to diseases such as diabetes and cancer. This symposium will cover our current understanding of epigenetic modifications and the functional role they play in regulating development and contributing to disease biology.

Topics:

* DNA methylation * Gene regulation * Histone modifications
* Non-coding RNA * Stem cell fate * Genomic imprinting * Epigenomics

*Impact Factor up! 3.989

Reviews by the speakers, based on their presentations at this major international meeting, will be published exclusively in *Biochemical Society Transactions** (Volume 41, part 2) and as a stand-alone volume of the *Biochemical Society Symposia* series.

For a full programme please visit: **www.biochemistry.org**

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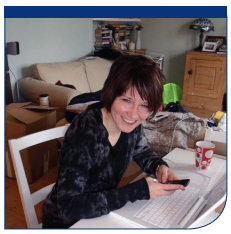
Editorial



Hazel O'Mullan
Managing Editor BPS

The European Congress of Pharmacology is hosted this year by the Spanish Pharmacological Society and is taking place in the beautiful city of Granada. EPHAR 2012 provides an opportunity for pharmacologists to come together and attend symposia covering the whole process of drug development from molecule to medicine. BPS is delighted to be joining Pharmacological Societies from across Europe to support the *6th European Congress of Pharmacology.*

In celebration of EPHAR 2012 this edition of *Pharmacology Matters* focuses on some of the issues that affect, and hopefully interest, pharmacologists from across Europe.

Offering us a glimpse into how pharmacology is administered across nine European countries, Professor Ulrich Forstermann (EPHAR President) and members of the EPHAR Executive Committee have produced a fascinating report, describing pharmacology and the activities of Societies across Europe, see p6.

We then turn our attentions to Sweden, p10, and an account of how Karolinska Development has created a sustainable model for identifying and supporting innovations by utilizing the brightest life science ideas from Nordic academia. Karolinska Development is a model for how closer collaboration between academia and industry can work, and how it has stimulated innovation during these times of economic instability.

Open access continues to divide opinion. Sue Thorn and Steve Byford's article *Academic Spring – a seasonal variation or global warming?*, p12, presents an update on the open access debate. This fascinating article on p12 will be of interest to those of you who publish research in UK journals.

The introduction of the EU Directive 2010/63/EU in January 2013 was addressed at a recent workshop organized by Understanding Animal Research, the Physiological Society and BPS. Ellie Hughes takes a look at the impact this new legislation may have on the way future research is conducted, p14.

Our new Chief Executive, Jonathan Brüün, penned his first instalment of *View from Angel Gate* having taking up the baton from Kate Baillie on 6 June. *A view from Angel Gate* will of course be an important part of Jono's new role as Chief Exec, but his main focus over the next few years will be primarily around ensuring delivery of our five year strategy. The proposals developed from the BPS strategy retreat will form the core of our strategy over the next five years. You can read our strategy on p22, please take some time to consider how you might support your Society in achieving its five year objectives.

Finally, I would like to thank Martin Todd for his support of, and erudite contributions to, *Pharmacology Matters* over the last three years, thank you Martin.

If you have any comments or would like to discuss any articles in this issue please email me at hom@bps.ac.uk.

Enjoy!

Contents

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View from Angel Gate

Jonathan Brüün
Chief Executive BPS

Hello everyone, and a particularly warm welcome to those attending EPHAR 2012. BPS is delighted to be attending this prestigious congress in Granada, and grateful both to EPHAR and our hosts, the Spanish Society for Pharmacology, for producing what I'm sure will be a fascinating event.

This is my first View from Angel Gate, having succeeded Kate Baillie as CEO in early June 2012 and it is my pleasure to pay tribute to the work Kate has led in recent years. Kate has been enormously successful in harnessing the contributions of our members, the skills and shared interests of our sector partners, and the hard work of the staff at Angel Gate to drive the Society forward. BPS now has a reputation in the sector, the country and abroad, as an engaged and engaging organization, and is all the better for it.

I'm sure you will join me, the Officers and Members of the BPS, and the team at Angel Gate in wishing Kate all the best in her new role as CEO of the Biochemical Society.

While I appreciate Kate will be a hard act to follow as CEO, I hope I can bring a mix of continuity and further development to the BPS, following her 4 ½ years of fantastic service.

I was recruited to the role of Head of Communications and Development at BPS in 2009, with a remit to support the External Affairs committee and its responsibility to engage more openly with our members and members of the public. Over the past three years I have helped deliver a public relations portfolio that included new online services, enhanced outreach activities, and improved relations with press and media outlets.

I gained further experience in a more central role as Director of Communications and Business Development from 2011, taking charge of the Society's relationship with its publishers, Wiley-Blackwell, supporting our relationships with national and international partners, and managing a larger team of Angel Gate staff.

I am absolutely delighted to have been given the opportunity to manage this terrific organization.

Looking over the activities undertaken on behalf of our members in the past few months, it is clear that collaboration with other Societies and organizations from the sector has been important.

A BPS delegation attended the Experimental Biology meeting in San Diego in April, to promote the Society and our journals, support editorial meetings and discuss closer working relationships with our colleagues at the American Society for Pharmacology and Experimental Therapeutics (ASPET). The result was confirmation of a joint meeting between our two Societies, which will be held at Experimental Biology, Boston, in April 2013.

The fascinating scientific programme provisionally includes over 30 symposia, key note lectures, networking events, a GPCR colloquium and a joint workshop on the Future of PhD Education in Biomedicine. Bursaries to attend will be available for BPS members, so keep your eyes on the BPS website and e-bulletins for more information.

Our events team have again been busy, delivering the popular *4th Focused Meeting on Cell Signalling* in Leicester, and the Safe and Rational Prescribing meeting in Dublin, contributing to *The Biomedical Basis of Elite Performance*, joint with the Physiological Society, and working with our Education team to ensure workshops on Statistics and Pharmacokinetics & Pharmacodynamics were a great success.

Another collaborative meeting, *Time for Change*, organized with Understanding Animal Research, The Physiological Society and Society of Biology, attracted 80 delegates and was held at the Wellcome Trust in April. Alongside four workshops from a range of contributors, Judy MacArthur Clark (Head, Animals in Science Regulation Unit, Home Office) gave the keynote speech.

The Clinical Section has been busy, supporting Professor Munir Pirmohamed's lecture on Personalised Medicines, the challenge of individualising treatments at the All Wales Medicines Strategy Group in Cardiff, and attending the Royal College of Physicians Medical Careers Day - a one-day careers conference offering advice and guidance for medical students and Foundation level doctors.

Our close links with Society of Biology are starting to bear fruit across a range of activities. In May, Professor Chris Garland, BPS Vice President for External Affairs, was elected to the Society of Biology Council, College of Organizational Members, and we should congratulate him on this terrific achievement.

We are also harnessing our relations with Society of Biology to make new inroads into the policy arena.

In March, eight members of our Young Pharmacologists group attended Voice of the Future – an initiative which enabled young scientists to sit in a Select Committee environment and ask questions of the Minister of State for Universities and Science, David Willetts, and Shadow Minister Chi Onwurah among others. Feedback from the event was excellent and can be summed up by one of our attendees, Liang Yew-Booth:

"I particularly appreciated the opportunity to personally ask Chi Onwurah my question regarding how the gender imbalance at higher levels in science can be redressed. I was pleased to hear that she agreed this was an important issue, in fact one of her priorities, and one that in her opinion can only be tackled by the scientific community as a whole".

Liang's full report can be found at: http://bit.ly/LANgWz

On the same note, our Women in Pharmacology (WiP) committee continues to deliver first class initiatives in promoting scientific careers. In April, a mentoring training day took place for 12 delegates who had applied to take part in our 2012 scheme. BPS now has over 70 mentors covering a variety of careers, ready for future mentoring matches.

The WiP committee have also organized a training day on 17 October entitled, *Career Crossroads to Career Activist: attracting opportunities in the current climate*, and you are welcome to get in touch with Hazel O'Mullan (hom@bps.ac.uk) if you are interested in attending.

With all of this activity, it's clear I'll have a busy time ahead as CEO of the BPS. I'm certainly looking forward to the challenge.

Kate Baillie - an appreciation

Presidents Emeritus Jeff Aronson, Graeme Henderson, Ray Hill and President Phil Routledge

In June of this year Kate Baillie stepped down as Chief Executive Officer of the British Pharmacological Society, moving on to become CEO of the Biochemical Society.

When the Society's Executive Officer of more than ten years' standing, Sarah-Jane Stagg, stepped down, the Society decided to move up a gear and appoint a Chief Executive Officer, to build on the foundations that Sarah-Jane had so capably laid and to develop the Society further. Head hunters were engaged and candidates were short-listed. The field was strong, but Kate, who had previously served as CEO of the British Society for Rheumatology and the International Association for the Study of Obesity (IASO), was the outstanding candidate. She took up office in 2007. Before too long she was making her mark.

The major project that she undertook in her first year was a complete restructuring of the office at Angel Gate, both physically and administratively. She rationalized staff roles and created a more efficient management structure. She then set about re-designing the office space on four floors, creating the meeting rooms on the ground floor, a reading room with hot desks for members on the first floor, and staff offices on the two uppermost floors. She created a comfortable environment and appointed members of staff who could work easily together. The friendly atmosphere at Angel Gate reflects that.

At about that time the Society was also engaged in negotiating new contracts for the British Journal of Pharmacology and the British Journal of Clinical Pharmacology with several powerful publishers. Those negotiations were a strong communal effort, conducted by a large group of members of Council and Presidents Emeriti, and Kate played an active part in steering them through. When the two journals came together under the banner of a single publisher, it was important to ensure that there was a smooth transition from previous editorial practices, particularly while the editorial offices of the British Journal of Pharmacology were being moved from Angel Gate to Wiley-Blackwell's offices in Oxford; Kate expertly negotiated those sometimes hazardous waters with tact and aplomb.

Other highlights of the time that she has spent with the Society include:

- the development of a new website and enhanced communications with members of the Society
- the transition from pA2 to *Pharmacology Matters*, the Society's newsletter
- the introduction of proactive public relations activities, including the appointment of a Head of Communications
- the formation of closer links and joint activities with a wide range of other societies, both national and international, particularly with other closely related learned societies, such as the British Toxicology Society and the Biochemical, Physiological, and Endocrine Societies
- the development of the Society's involvement in social network channels, including Facebook and Twitter, and other public engagement activities, such as the introduction of BPS sponsored lectures at the Cheltenham Science Festival, our annual contributions to which have been enormously popular and have led to further outreach to schools
- increasing involvement with the press and the Science Media Centre, through the work of the Director of Communications and Business Development, providing comment and expert opinion as stories break and ensuring that the Society is very often the first port of call for comment

Kate has also given enormous backing and support to members of the clinical section, in their dealings with the Department of Health and the Medical Schools Council, in the development of the Society's e-learning program, *Prescribe*, and the Prescribing Skills Assessment for final-year medical students.

Kate has worked with four Presidents of the Society and has developed excellent relationships with them all, whole-heartedly supporting them in all their endeavours. Her long experience in the management of bioscience societies has stood us in good stead. She has wide interests, including a deep affection for beach huts, and the Russian dictionary that sits on her bookshelves is just one of many books on diverse subjects. We are delighted that she will be succeeded by Jonathan Brüün, who joined the Society as its Head of Communications and Development in 2009, and has been Director of Communications and Business Development since 2011. Jonathan will be as hard an act to follow in the communications department as Kate will be in the role of CEO. We hope that Kate will keep in touch.

Chris Kirk and Kate, past and present Biochemical Society CEO's

Pharmacology across Europe, a status report

Ulrich Förstermann
President of EPHAR

This article was prepared by Ulrich Förstermann (Germany), President of EPHAR, and the members of the EPHAR Executive Committee: Pascal Bousquet (France), Filippo Drago (Italy), Thomas Griesbacher (Austria), Aletta Kraneveld (The Netherlands), Charis Liapi (Greece), Eeva Moilanen (Finland), Daniel McQueen (UK), and Michael Mulvany (Denmark).

The Federation of the European Pharmacological Societies (EPHAR) was founded in 1990 by originally eight member societies (including the British Pharmacological Society). EPHAR has now grown to 26 member societies, representing over 10,000 individual pharmacologists across Europe. For the last 22 years since its establishment, EPHAR's mission has been to promote co-operation between national pharmacological societies in Europe and to advance research and education in pharmacology. In pursuit of this goal, EPHAR has organized and supported key scientific events, the most important ones being EPHAR congresses. Five such congresses took place in different European cities (Milan 1995, Budapest 1999, Lyon 2001, Porto 2004 and Manchester 2008), the sixth will be held in Granada, Spain 17-20 July, 2012. The congress is expected to be the biggest held in this series so far with over 1000 participants attending. There is a significant commitment of EPHAR member Societies to this congress with many organizing and/or sponsoring symposia. In addition, EPHAR's annual activities include the sponsoring of EPHAR Lectures (3-4 per year), EPHAR Symposia (1-2 per year) and EPHAR Instructional Courses with a limited number of participants (1-2 per year).

Pharmacology as a unique discipline was established in Europe in the middle of the 19th century, with a number of chairs and institutes of pharmacology being founded in several European universities. The formal beginnings of the discipline coincided with the discoveries of the first defined drugs: morphine 1806, glycerol trinitrate 1849, phenacetin 1887, acetylsalicylic acid 1897, heroin (as a cough medicine) 1897, cocaine (as a local anesthetic) 1900, etc. However, the context in which pharmacology is taught, and the role and scope of pharmacology departments in universities still differs between European countries. Therefore, on the occasion of the 6th European Congress of Pharmacology, the EPHAR Executive Committee (consisting of nine pharmacologists from nine member countries) has written this short account on the status of pharmacology in nine different European countries (in alphabetical order).

Austria

The formal history of pharmacology in Austria began in the late 19th century with the setting-up of chairs of pharmacology, generally in combination with other medical disciplines like general pathology (Graz 1863, Innsbruck 1869). The emancipation of pharmacology as an independent discipline was followed by the establishment of university departments of pharmacology in Vienna (1890/1891), Innsbruck (1892) and Graz (1903). Today there are 11 departments of pharmacology in the Universities and Medical Universities of Vienna, Graz and Innsbruck, the University of Veterinary Medicine in Vienna and the Paracelsus Private Medical University in Salzburg. Some of those departments are independent whereas others form sections of university centres that are composed of several related disciplines.

Pharmacology is a regular part of Austrian university curricula of medicine, dentistry, pharmacy and veterinary medicine. Pharmacology is also taught in schools of biomedical analytics or nursery. In recent years, most universities have set up PhD programs, and many of the Austrian pharmacology departments are organizers or co-organizers of graduate schools within these programs. Pharmacology is also recognized as a medical specialization by the Austrian Medical Association. In recent years the standards for the training of specialists in pharmacology have been formalized and certification exams have been introduced, which are supervised by the Austrian Medical Association and the Austrian Pharmacological Society (APHAR).

APHAR was founded in 1995 and thus is a relatively young scientific society. At the moment (2012) APHAR has 168 members of whom 61 are also members of the section of clinical pharmacology. Since the year of its foundation, APHAR has been organizing an annual scientific symposium. Since 2004 pharmacological societies of other European countries (usually neighbouring countries) have been invited to take part at these symposia. Accordingly, the meeting language of the meetings was changed from German to English.

An important aim of APHAR symposia is the support of young scientists in the field of pharmacology. Most presentations are given by PhD students or young scientists, often as their first exposure to a scientific event. APHAR also provides travel grants for the participation in APHAR meetings for students (including students from institutions located in the countries of invited guest societies).

Denmark

In Denmark, pharmacology is an integral part of the curriculum of medicine, dentistry, veterinary medicine, and pharmacy and of a series of education program aimed at medical industry e.g. molecular medicine or human biology. However, the mode of teaching pharmacology differs considerably in the four Danish universities. In some cases pharmacology is integrated with other subjects, in other cases there are regular pharmacology courses with lectures and problem-based learning. Syllabuses and teaching intensity also vary, with the most intensive pharmacology courses being given to students in pharmacy and veterinary medicine.

For many years, pharmacology has played a less important role in the curriculum of medical students, in part because pharmacology had been assimilated in larger departments at all universities. However, there is an increasing public and political awareness

that medical students should receive independent courses in basic and clinical pharmacology, and be required to learn the concepts of pharmacology to ensure proper use of drugs and awareness of side-effects and drug interactions. As a consequence, clinical pharmacology and the practical aspects of drug application are receiving increasing attention in recent years.

Scientifically, pharmacology in Denmark focuses on protein pharmacology, receptor pharmacology, and clinical pharmacology in close collaboration with clinical departments. Recently, the five different pharmacology societies established an umbrella organization, the Danish Society for Pharmacology, to strengthen the subject and to co-ordinate its promotion. This society hosted the IUPHAR 2010 congress in Copenhagen in 2010, WorldPharma2010.

The Danish departments of basic and clinical pharmacology collaborate on updating a traditional Danish textbook of basic and clinical pharmacology, which was started in 1941 by Professor. Knud O. Møller, University of Copenhagen. The book focuses on drugs that are normally prescribed in Denmark.

Finland

Academic pharmacology in Finland has nearly 200 years of history – a professorship in pharmacology and pharmacy was established in 1844 at the Imperial Alexander University, which became the University of Helsinki with Finnish independence.

In Finland, pharmacology as an academic discipline is studied in five medical schools, at the Universities of Helsinki, Tampere, Turku, Oulu and Eastern Finland (Kuopio) and in three Schools of Pharmacy, at the Universities of Helsinki and Eastern Finland (Kuopio) and at Åbo Akademi University (Turku). Four of the Medical Schools also have Chairs in Clinical Pharmacology. Pharmacology in Finland is a dynamic discipline attracting talented young investigators from the medical, biomedical and natural sciences. Pharmacologists are actively involved in many areas including postgraduate medical education, development of evidence-based therapeutic guidelines and national pharmaceutical safety, regulatory and quality assurance services.

The strongest research areas in Finnish Pharmacology are neuropharmacology, cardiovascular pharmacology and immunopharmacology. The clinical pharmacologists focus mainly on drug metabolism and transporters in their research.

The Finnish Pharmacological Society was established in 1948 by 14 founding members. Today, the Society has more than 500 members, an impressive number in a country with about 5 million inhabitants. The members are physicians, pharmacists and scientists interested in pharmacology and drug treatment. The Society organizes two scientific meetings annually focusing on specific developments in pharmacology. It operates in close collaboration with the national FinPharma Doctoral Program to support doctoral education in pharmacology and related scientific disciplines.

France

The discoveries of the first antihistamines by Daniel Bovet and Paul Charpentier (Paris, in the 1940's), the further development into the first neuroleptic drugs by Henri-Marie Laborit, Jean Delay and Pierre Deniker (Paris, in the 1950's) and the discovery of hypoglycemic sulfonylureas by Marcel Janbon and Auguste Loubatières (Montpellier, in the 1940's) were some of the French seminal contributions to modern pharmacology and drug discovery.

At present, pharmacology is represented in all French universities: in the 27 medical schools and 15 faculties of pharmacy.

Pharmacology is also present in academic institutions belonging to the National Institute for Medical Research (INSERM) or the National Centre for Scientific Research (CNRS) as part of biochemistry, neurobiology, or cancer research. Academic pharmacologists are active in many programmes: medical and pharmaceutical education, master degrees, graduate and post-graduate programmes.

Many different areas are actively covered by French pharmacologists: cardiovascular and neurobiology and renal pharmacology by tradition, anti-cancer drugs, clinical pharmacology, and pharmacovigilance are some examples.

The first Association of Pharmacologists in France was founded in the sixties. It became the French Society of Pharmacology in 2002 and merged with the Society of Therapeutics in 2004. The unified French Society of Pharmacology and Therapeutics (SFPT) presently have more than 600 members. Members are from academia and industry. For the last eight years, the Society has been organizing annual meetings together with the French Society of Physiology. The last meeting in Dijon 2012 gathered more than 800 participants. SFPT has two different journals, "Thérapie" (articles in French) and "Fundamental and Clinical Pharmacology" (international journal published in English). In addition to the annual meeting, the SFPT organizes several specialized meetings focusing on clinical pharmacology, pharmacovigilance, pharmaco-epidemiology and other topics.

Germany

German pharmacology started in 1847 with the first department being founded by Rudolf Buchheim at the German-Baltic University of Dorpat in the city of Tartu in Estonia. He was succeeded in Tartu by other founding fathers of German pharmacology namely Oskar Schmiedeberg (later moved to Strasbourg) and Rudolf Böhm (later moved to Leipzig). German pharmacology flourished at the beginning of the 20th century, often with successful collaborations between university pharmacologists and industry. The discoveries of the first barbiturate barbitone (Emil Fischer and Joseph von Mering, 1902), the anti-syphilis drug salvarsan (Paul Ehrlich 1909), the anti-malarial agent mepacrine (Werner Schulemann, 1932), the antibacterial sulfonamides (Gerhard J.P. Domagk, in the 1930ies) and many others demonstrate the productivity of that period. Pharmacology slowly recovered in postwar Germany, initially hampered by the lack of qualified personnel and the existence of two German states separated by the Iron Curtain.

Today, after the reunification, Germany has 37 departments of pharmacology in university medical schools and ten in pharmacy schools. Approximately ten more departments are to be found in faculties of veterinary medicine, non-university research institutions or big hospitals. In Germany, unlike other countries, pharmacology has always been and still remains an integral part of the curricula of medicine or pharmacy. As a consequence, until the 1970's almost all Germany pharmacologists were either physicians or pharmacists by training. More recently, there is an increasing number of scientists from other biomedical areas working in German pharmacology departments with the number of physicians decreasing. In Germany, pharmacology is still considered an important component of medical and pharmacy training and – unlike the development in other countries – has not been abandoned by any faculty of medicine or pharmacy. Lately, a few universities have also established bachelor-, master- or PhD courses in pharmacology.

German academic pharmacology in the 1960's and 1970's was largely receptor pharmacology. Since the 1980's pharmacology in Germany became more molecular and was dominated by signal transduction work and neuropharmacology. Today the spectrum is more diverse with pharmacology transgressing boundaries with related disciplines and immunopharmacology, pharmacology of inflammation, or pharmacology of ion channels playing an increasing role. German pharmacology has strongly focused on basic science, interdisciplinary and translational research and has developed into a biomedical research field, which strongly supports and facilitates the foundation of new coordinated research centers and initiatives at many universities in Germany.

The "Deutsche Pharmakologische Gesellschaft" (today Deutsche Gesellschaft für Pharmakologie/German Society for Pharmacology) was founded in 1920. At the time, it was a society representing the German-speaking pharmacologists of central Europe. For instance, the Austrian pharmacologist Hans H. Meyer (Vienna) was one of the founding fathers of the Society, and the oldest list of Society members (from 1925) shows that about one third were from neighboring countries.

Greece

The first Medical School at the University of Athens was established in 1837 and the first Department of Pharmacology was established in 1845. It is interesting that the term "pharmacology" is derived from the Greek words "pharmakon", meaning a drug or medicine, and "logos" meaning the truth about or a rational discussion.

A role model for pharmacologists, as well as for other scientists in Greece, was Georgios Ioakeimoglou, who became professor of pharmacology at the Medical School in Athens in 1928. After completing his studies in Germany, Professor Ioakeimoglou worked with Arthur C.W. Heffter, whom he succeeded at the University of Berlin in 1922. Professor Ioakeimoglou was highly respected in the pharmacological community of the time, both in Europe and the United States. He was a particularly talented instructor and creator of pharmacological techniques and methodologies, he had a profound influence on several generations of physicians and scientists until his retirement in 1963. Indeed, many of the first professors in new departments of pharmacology in Greece were his students.

Currently there are nine departments of pharmacology in Greece totaling approximately 50 faculty members. Seven departments are located in medical schools, and two in schools of pharmacy. In earlier years most of the faculty members were physicians and pharmacists, but nowadays pharmacologists are drawn from different biomedical fields. Basic pharmacology at the medical schools is complemented by other elective courses such as molecular pharmacology, rational prescribing, social pharmacology, and social, political and economic aspect of drugs. Although clinical Pharmacology is an obligatory course in many Medical Schools, and for many years a postgraduate course, Clinical Pharmacology has been in place at the University of Alexandroupolis, the first Professor of Clinical Pharmacology was only elected in 2010 at the Medical School of Aristotle University of Thessaloniki.

For over a decade pharmacologists have been struggling to establish bachelor, master- or PhD courses in pharmacology, but so far without success. University research funding in Greece has always been very limited, and pharmacological research has mainly been supported by grants from international interactions.

The majority of Greek pharmacologists actively participate at European and overseas pharmacology meetings, both clinical and basic and many Greek pharmacologists are part of European Committees involved with drug therapy. Many international collaborations and publications in prime journals demonstrate the quality of pharmacological research in Greece and the contributions of Greek scientists to the discipline.

Italy

Pharmacology started officially in Italy with the foundation of the Italian Society of Pharmacology in 1939. The discipline has grown over time and currently the Italian Society of Pharmacology has over 1,200 members. In the last twenty years, Italian pharmacology has gradually changed from a typical scientific community devoted mostly to the exchange of scientific information among its members to a kind of professional society which, without severing its scientific roots, aims to promote pharmacology in Italy by fostering pharmacological education at universities and also in non-university institutions. Founders of the modern pharmacology in Italy are names which remain in the history of medicine: Leonardo Donatelli, Emilio Trabucchi or Egidio Meneghetti. Not to be forgotten is the pioneering work of Vittorio Erspamer who discovered, synthesized and tested over sixty pharmacological substances among them (in the 1930's) an amine he named enteramine, which later became known as serotonin.

The major research fields today are those initiated by the fathers of modern pharmacology: neuropsychopharmacology, cardiovascular pharmacology, neuroendocrinepharmacology, to which molecular biology and biochemical pharmacology have been added in the last 5-10 years. In these areas, eminent Italian researcher have made exceptional contributions also in foreign countries, where many worked and lived for long periods of time: For example Erminio Costa, Sandro Guidotti, Ezio Giacobini, and more recently Napoleone Ferrara who received the 2010 Lasker-DeBakey Clinical Medical Research Award.

The National Health System in Italy has benefitted significantly from the work of pharmacologists in committees for drug assessment, approval and reimbursement. This is probably the best demonstration of how pharmacology is not only a research or academic discipline, but can contribute to the maintenance of a good standard of public health.

The Netherlands

On May 2 1908, the Dutch Queen Wilhelmina appointed Rudolf Magnus (1873-1927) as Professor in the Medical Faculty of the State University of Utrecht for the specialty pharmacognosy and pharmacodynamics. This appointment was the first chair in pharmacology in the Netherlands. Since then pharmacological research has spread over almost all universities in the country.

At the Rudolf Magnus Institute Utrecht psychopharmacologists investigate brain (genetic) mechanisms in psychiatric disorders to unravel new targets. At the Utrecht Institute for Pharmaceutical Sciences, new compounds and specialized nutritional concepts targeting the immune system are investigated in allergy, inflammatory bowel disease, chronic obstructive pulmonary disease and asthma. In addition, at Utrecht Institute for Pharmaceutical Sciences the interface between the nervous and immune systems is investigated as a new target for therapy of psychiatric disorders associated with intestinal problems.

Animal pharmacology is studied at the Faculty of Veterinary Sciences of Utrecht University. At Groningen University Institute for Drug Exploration, research on immunological regulation mechanism of the pathophysiology of asthma and chronic obstructive pulmonary disease aims at the development of novel pharmacotherapeutics. Within the Clinical Pharmacology group at Groningen, investigations focus on the improvement of current therapies and/or development of new (gene) therapies to halt or improve loss of cardiac, renal and vessel function.

The program of the Department of Pharmacology, Vascular and Metabolic Diseases of the University Medical Center Rotterdam (Erasmus Medical Center), is devoted to a better understanding of the mode of action of drugs and their interaction with endogenous mediators in diseases such as migraine, hypertension, myocardial ischemia and heart failure.

Research at the Department of Pharmacology of Maastricht University Medical Center also investigates new targets for the prevention of heart failure, reduction of end organ damage in hypertension and diabetes.

At the Leiden-Amsterdam Center of Drug Research scientific work focuses on molecular pharmacology of histamine and human/viral chemokine receptors and on pharmacokinetic-pharmacodynamic (PK-PD) modeling.

The Department of Pharmacology and Toxicology of the Radboud University Nijmegen Medical Center aims to improve the efficacy and safety of drugs. Research focuses on toxicokinetics, regulation of drug transporters, transport ATP-ases, cardiovascular diseases and diabetes.

At Wageningen University, the group Human Nutrition and Pharmacology focuses on the study and evaluation of bio-active compounds in food in disease. On the edge of dietary intervention and pharmacotherapy the research program aims to translate and integrate knowledge in obesity and its metabolic complication in order to find better therapies.

United Kingdom

The British Pharmacological Society (BPS) is an educational charity established in 1931 in Oxford, by the founding fathers of British pharmacology James A. Gunn (Oxford), Walter E. Dixon (Cambridge and London) and Henry H. Dale (Wellcome Research Laboratories, Nobel laureate 1936). The BPS is committed to promoting pharmacology in the UK and abroad. It is actively responding to challenges, which the discipline currently faces as a result of the severe financial pressure being experienced by universities, hospitals and the pharmaceutical and biotechnology industries in the UK and overseas.

BPS supports pharmacology through various national and international initiatives for the benefit of its members (over 3000 biomedical scientists and clinicians in 60 countries, covering all elements of the subject), as well as other scientists and the wider public. This support includes provision of undergraduate and postgraduate education and training, organizing scientific meetings and symposia, and engaging in policy making with other societies, government agencies and politicians. BPS owns and edits high quality international journals (British Journal of Pharmacology, British Journal of Clinical Pharmacology, published in collaboration with Wiley-Blackwell). The Society also communicates information to the public via its website www.bps.ac.uk, the house magazine (*Pharmacology Matters*) and social networking. The web-based BPS Guide to Receptors and Channels (GRAC) is being enhanced in collaboration with IUPHAR and their nomenclature database. A Guide to Target Validation is being explored as a key enabler for Open Innovation activities in global drug development, safety and clinical trials.

Education is vital for sustaining and developing pharmacology as a discipline. The Society provides web-based learning aids, runs courses, including the Diploma in Advanced Pharmacology, an *in vivo* programme, e-learning for Continuing Professional Development and is leading the development of the national online Prescribing Skills Assessment for junior doctors. Careers advice is provided for pupils and teachers in secondary schools and the Society engages with national Science Festivals. Free undergraduate membership of the Society is also offered, with complimentary attendance for all members at BPS meetings and symposia, together with the incentive of competitive prizes and awards.

BPS recently revised its management, restructured its organization, enhanced its web presence and interactions with other Societies, negotiated new journal contracts and reformulated its fiscal reserves policy in order to increase its effectiveness. Pharmacology's profile in the UK has been raised, and BPS continues to support pharmacology in Europe through various special initiatives in collaboration with EPHAR, including: the 5th Congress in Manchester 2008, lectures, symposia, courses at various joint meetings of European societies, and WorldPharma 2010 in Copenhagen.

The British Society is sponsoring and organizing symposia at the 6th European Congress of Pharmacology in Granada, Spain, July 2012, and its members and officers greatly look forward to active engagement with fellow pharmacologists during the Congress.

Karolinska Development – commercializing top class research

Torbjörn Bjerke
CEO Karolinska Development

Torbjörn Bjerke, MD, has over 20 years of experience in the pharmaceutical industry, including as President and CEO of Orexo AB, a position he held from 2007 until January 2011, President and CEO of Biolipox AB and Director of Pharmacology at AstraZeneca. He has also served as Executive Vice President of R&D at ALK-Abello. Other appointments include Chairman of Pergamum AB and Board member of NeuroSearch AS, Axelar AB, Aprea AB, Pharmanest AB and Paris-based DBV Technologies.

The listing of Karolinska Development marked the start of a new phase of its development and was a confirmation of the strength of the Karolinska Institutet Innovation system. Since 2003, Karolinska Development, provided with access to a large flow of innovations and a cost-effective model for the development of medical innovations, has built one of Europe's largest investment companies within the life sciences – to the benefit of all stakeholders.

April 15, 2011

The first day of trading with Karolinska Development's shares on Nasdaq OMX Stockholm. This was a milestone for the company and for the Karolinska Institutet Innovations system. In connection to the listing, Karolinska Development raised more than MSEK 600 through a number of institutional Swedish and international investors, as well as private investors, providing financial strength in order to be able to continue developing a life science portfolio of mature clinical projects as well as new innovations to for the medical demands that exists today and in the future.

It all began in 1999 when Professor Hans Wigzell, at that time President of the Karolinska Institutet, decided to create a sustainable model for identifying, evaluating and supporting life science innovations. The result was the Karolinska Institutet Innovation system.

A few years later, he founded Karolinska Development. To date, Karolinska Development has raised more than SEK 1.6 billion and, through the exclusive agreement with the tech transfer organization Karolinska Institutet Innovation AB, evaluated more than 1.300 innovations, resulting in a portfolio currently consisting of 36 projects, of which 15 are in clinical development.

The Karolinska Institutet Innovation system

There is a steady and increasing flow of promising research results and innovations in the life science sector. Many of these have great potential to contribute to a better life for millions of people but also, if exploited successfully, to be the basis for new jobs and growing businesses. At the same time, investments in early development projects decrease in parallel with increased demand from the pharmaceutical industry for late stage clinical projects, making the need for effective models and guidance in the commercialization process of valuable research universal.

The Karolinska Institutet Innovation system comprises supporting functions for all phases of the innovation development, with close cooperation and with the same values and overall goal – to create the best possible conditions for a viable development of interesting research findings.

Innovation and entrepreneurship

Taking a promising idea into an actual commercial set-up is a crucial step for the researcher teams in order to realize the therapeutic potential. Professional guidance in this process is often essential to get a solid platform for further progress of the innovation and the business opportunity. Karolinska Institutet Innovations has a network of experts with extensive experience in every step of the development process, from assessment of the potential of early discoveries in life science, to the sale, licensing or incorporation. Whatever decided, Karolinska Institutet Innovations assists in developing a patent- and marketing plan. In addition, the network of experts provides additional scientific evidence to validate the concept in commercial terms.

A service concept for growing companies

A growing company needs more than just office space to function well. Through the Karolinska Institutet Innovations system, companies are offered a complete service concept and a creative environment with excellent service to stimulate the expansion of the companies as well as the important transfer of knowledge between the commercial world, the academy and the society.

Karolinska Development – commercializing top class research

Being close to cutting-edge academic research has enabled Karolinska Development to build a highly innovative portfolio, where more than 20 compounds have first-in-class potential in their respective therapeutic areas.

Karolinska Development selects the most commercially attractive ideas from a unique flow of innovations, where Karolinska Institutet Innovations, along with other cooperation agreements with leading Nordic universities, deliver a continuous flow of innovations. To refine and develop these innovations the company works with a wide network of individuals throughout their development. The network includes over 300 individuals with experience from development work within life sciences, project managers, and people with management and board skills. It also includes professors and researchers at Karolinska Institutet, as well as at many other universities in Sweden, Denmark, Norway, and Finland.

Karolinska Development's management team has extensive experience from pharmaceutical development, business development and finance from global pharmaceutical companies and investment banks. It utilizes this experience through close collaborations and representation on the boards of its portfolio companies, and by tapping a wide-ranging network of contacts to ensure that each project has access to the right experts and business contacts.

In most cases Karolinska Development assumes the role of lead investor, usually with an ownership stake in its portfolio companies of over 40 percent. This lead role is important in that it allows Karolinska Development to be an active owner, which is a cornerstone of its strategy.

Projects in all phases

Since its inception in 2003, Karolinska Development's portfolio has evolved from projects mainly in lead optimization phase into a balanced portfolio of pharmaceutical development projects in all phases from discovery to Phase II. Among Karolinska Development's pharmaceutical development projects, 25 have reached lead optimization phase or beyond, and 15 projects are in clinical phase. In addition to the pharmaceutical development projects, the portfolio also includes nine medical technology projects.

Axelar is one of the companies in the Karolinska Development portfolio that was developed from an early preclinical stage to a promising Phase II drug candidate, targeting lung cancer and potentially a range of other cancer types. Axelar's lead compound AXL1717 has showed a good tolerability profile from the completed Phase I/II trial. Most encouragingly, there were also signs of clinical efficacy even though the trial was primarily set up to evaluate the safety features of the drug candidate. Late 2011 the project was therefore swiftly moved into a Phase II trial where it is compared with an existing standard treatment for lung cancer patients.

Oncology is an important area for Karolinska Development. Besides Axelar, there are four other companies in the portfolio focused on pharmaceutical development in oncology, three of which are in clinical development phase and one that develop diagnostics and therapeutic devices. Other areas where Karolinska Development has projects in clinical development phase are skin infection and women's health.
Karolinska Development has a flexible exit model, reflecting a surge in the need from the pharmaceutical industry to insource research and development of new products rather than the traditionally carrying those activities in-house. Typically the best return of investment for pharmaceuticals occurs after Phase II clinical trials when efficacy on patients has been shown.

Mitigating risk - large sales potential

Karolinska Development's investment strategy is to diversify risks through active ownership of a large portfolio. It manages the risks inherent in pharmaceutical and medical technology development by continuously monitoring each project's progress and in this way can focus its resources where they do the most good at any given time.

Karolinska Development's investments are aimed at meeting large medical needs and in that way generating a high return on the portfolio. Since Karolinska Development doesn't have a limited investment horizon, the company can capitalize on a large percentage of the future income potential of its projects. Many drug candidates are focused on markets with multi-billion dollar sales potential if the product reaches its targets. This is because they are clearly differentiated and have the potential to increase life expectancy, improve quality of life and sometimes save lives.

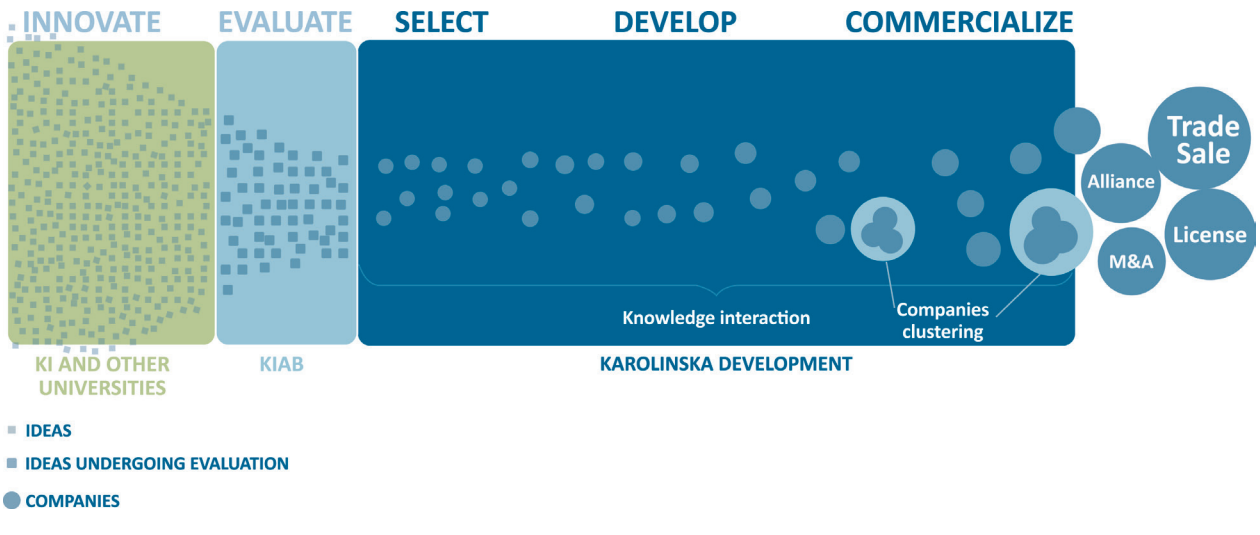
A resilient development model

Since inception, the Karolinska Institutet Innovations model has proved efficient and resilient, easy to adapt to changed market needs and business cycles. The complete chain of support, from the first sign of commercial potential in early discoveries to the sale or out-licensing of products, gives the researcher a solid platform to work from. Ultimately it improves the chance for us all to benefit from new valuable life science innovations.

Fig 1.

Commercialization in three steps

Karolinska Development's business model is to: SELECT the most commercially attractive medical innovations; DEVELOP innovations to the stage where the greatest return on investment can be achieved; and COMMERCIALIZE the innovations through the sale of companies or out-licensing of products.



Academic spring – a seasonal variation or global warming?

Steve Byford
Independent STM publisher

Sue Thorn
Managing Director, Sue Thorn Consulting Ltd

Steve Byford FSB has over 25 years' experience in academic journals publishing, including 17 years at the Society for Endocrinology and its trading subsidiary, BioScientifica, most recently as its Publications Director. He has spoken publicly on open access issues, and is a member of the Society of Biology's recently-convened Research Dissemination Committee.

Sue Thorn FSB currently runs Sue Thorn Consulting Ltd. She has 30 years' experience in academic journals publishing and the management of learned societies. She was CEO of the Society for Endocrinology for almost 20 years and Managing Director of BioScientifica. She was Chair of the Association of Learned and Professional Society Publishers for three years and currently chairs the Society of Biology's Research Dissemination Committee.

"Wellcome Trust joins 'academic spring' to open up science", blazed the front-page headline of *The Guardian* on 10 April. The Trust was to "throw its weight behind a growing campaign to break the stranglehold of academic journals and allow all research papers to be shared online".

The campaign for "open access" (OA) to research outputs, free to any reader with access to the web, has been debated vigorously for at least a decade, but these things don't usually make the headlines. So why now?

From the outset, a possible alternative business model for OA scholarly publishing had been identified. Instead of charging readers for access (usually via their libraries), publishers could charge authors (or their funders or institutions) and then make the resulting online article free to all. This is now known as "Gold" OA.

Many (but not all (1)) publishers of scientific journals were decidedly cool or even hostile to calls for any form of OA from stakeholders concerned about what they saw as the high costs of research dissemination and validation. As a result, research funding bodies, institutions and their libraries, and even governments, started to take things into their own hands, seeking to bypass publishers' access controls by setting up open repositories into which researchers were encouraged or even mandated to deposit their articles for free online dissemination – so called "Green" OA. It involves no fee and no business model.

These stakeholders have seized the initiative, also proposing revisions to copyright law to provide more public access to copyright materials, both to the full articles themselves and via text mining.

Matters have reached a renewed head in just the last few months. Last summer, *The Guardian's* George Monbiot opined that "Academic publishers make Murdoch look like a socialist". Then, in the early months of this year, open antagonism towards publishers escalated.

In January, Cambridge mathematician and Fields Medal winner Tim Gowers blogged that he would no longer cooperate in any way with Elsevier, either as an author, referee or editorial board member. Elsevier, amongst its massive portfolio of scholarly journals, publishes many prestigious mathematics titles. Gowers objected to its prices, its policy of selling online journals in bundles and its lobbying activities, especially in the USA, in opposition to proposals that he saw as improving access to journal content.

The online discussion that followed led to the creation of a public campaign against Elsevier. On the "cost of knowledge" website, academics could publicly commit to boycotting Elsevier's journals. At the time of writing (May), the number of signatories had reached over 11 000.

It is this that has caught the attention of the news media, and the coining of the term "academic spring". A few days after the Guardian article quoted above, an editorial in *The Economist* (14 April) pronounced *"When research is funded by the taxpayer or by charities* [our italics], the results should be available to all without charge".

Strikingly, when a representative of the Publishers Association wrote an earlier *Guardian* piece saying "Branding academic publishers 'enemies of science' is offensive and wrong" on 27 January, all the online comments found the article objectionable.

When academic publishing reaches the front page, we know things are really heating up. And, although much of this invective is specifically targeted at Elsevier's reported 35% profit margins, often critics are at least partly using this as shorthand for 'for-profit, non-OA' publishers. These same publishers, of course, publish the journals of most learned societies, including BPS, so societies may well be directly affected by this negative PR.

We focus here on three interesting aspects of this debate:

1) The 'public access' argument: 'publicly-funded research should be publicly available'

2) The 'too much profit, too many restrictions' argument: widespread reaction against what is seen as excessive profits being made by some publishers, who at the same time are perceived as seeking to impose unreasonable restrictions on the ways published outputs can be used.

3) The 'rampant capitalism' argument: a broader reaction across much of society against perceived corporate greed, where excessive salaries and profits are achieved, especially in a low-risk business environment.

The public access argument

Journal articles are funded by the taxpayer, written by academics for no fee, reviewed also by academics for no fee, so why should there be barriers to anyone accessing the material who wants to? Publishers say they add value in several ways. Even though critics say this is overstated, publishers do invest in systems and staff to manage and facilitate timely and rigorous peer review, to edit, code and format the text, to add context and discoverability to the content in the wider digital environment. All of these certainly cost something to achieve, and are valued by authors and readers. But there is also more to it than just the process of dealing with individual articles. Learned societies work with their publishers to actively build the profiles of their journal brands by keeping them relevant to developments in their disciplines. This can represent a long-term investment of time and resources. The result is that the prestige of publishing in journal A is different from that of journal B, giving readers a clue as to where to find the research most valuable to them.

Nonetheless, it is surely by now clear that Gold OA is a viable business model to support this. There are still practical challenges in making it work, in particular authors' ability to access funds, especially after a grant has ended. It is also clear that there are particular difficulties for research that is not comprehensively supported by grant funding. This includes much clinical research, for example. In these cases, Gold OA, if required, would need to be funded by the university, hospital or some other body.

The argument about whether OA is the way forward is perhaps largely over – the question is now turning to *how*. Funders and governments are increasingly insisting on free public access within a short time of publication. There is strong political momentum towards this in a number of countries including the UK, and also at EU level.

The 'too much profit, too many restrictions' argument

The feeling that Elsevier's margins are unacceptable has been a significant contributor to the "cost of knowledge" boycott, especially in extremely tight economic circumstances in which libraries say they are making very difficult spending cuts. Some publishers do indeed appear to make large profits. However, it is not fair or correct to tar all with the same brush: not all publishers' profits are unreasonable, and often much or all of it goes back into the academic community via learned societies. The work by reviewers and editors can then be thought of as helping to earn resources for the benefit of their discipline.

Though we may insist that not all publishers and societies deserve criticism, some vociferous and influential parties are not listening. They are attacking the publishing industry generally. And what is a fair profit margin?

Broad reaction across society against rampant capitalism

The wake of the 2007-8 global economic crash has led to ordinary people seeing themselves paying for years and possibly decades to compensate for the failings of bankers who seem to be suffering much less, if at all. This is having a knock-on effect on perceptions of private enterprise as a whole, and especially of large corporations.

In a normal market, income is determined by the customer's appetite for your product or service at the price you are asking, and this usually limits the level of profit margin. However, for this model to work well there has to be pressure on prices, so that they are positioned low enough to encourage the market to buy. However, with journals, those who 'consume' the product (the author and reader) and those who pay (the library) are not connected in their decision-making. This has led over many years to a dysfunctional market: the decisions on what journals to subscribe and submit to are divorced from decisions about value for money. With the caveats stated earlier about funding, Gold OA has the potential restore functionality to this market. It will probably drive prices and profit margins down, but the publisher who provides prestige, quality, service and functionality at a good price will attract more papers, so their actual profits could even rise. There is finally an incentive for publishers to deliver what all parts of the market want.

There are unstoppable forces at work. Gold OA can deliver if the practical issues are resolved collaboratively by all parties as recommended by Universities UK and the Research Information Network in 2009 (2). With Gold OA, the link between price and value is transparent, which is surely as it should be. If publishers get it right and deliver what the market wants at a fair price, there are probably still good opportunities for academic and financial success.

In conclusion, the way forward is surely for publishers to meet and engage with the needs of the library community, funders and governments. The debate with these groups is maturing and publishers can now get beyond the earlier antagonistic rhetoric to deal with the practical issues. The UK Government appears to understand the subtleties and complexities, as evidenced by David Willetts MP's speech to the Publishers Association on 2 May (3). As well as recognizing "the value which publishers add", he also acknowledged that it "would be deeply irresponsible to get rid of one business model and not put anything in its place." We can't prevent new business models, but we can shape them. To quote the former Vicar of Badminton, "If you can't prevent the wall from collapsing, at least push it the way you want it to go."

And if publishers and other stakeholders could work together to deliver a genuinely sustainable model that meets everyone's needs, that would surely be worthy of a few headlines.

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3) Willetts D Public access to publicly-funded research 2012 http://www.bis.gov.uk/news/speeches/david-willetts-public-access-to-research

Since the above article was written in May, Dame Janet Finch's working group has published its report "Expanding access to research publications", recommending a coordinated move towards sustainable open access and echoing many of the themes set out above. The full report is at http://www.researchinfonet.org/publish/finch/.

Time for Change: Addressing Changes to the Animals Scientific Procedures Act

Ellie Hughes
BPS member

Ellie has recently finished an MRes and PhD at the Centre for Integrative Mammalian Physiology and Pharmacology (CIMPP), Imperial College London. Funded by a partnership between numerous research councils and the pharmaceutical industry, the Imperial College London CIMPP is one of four UK centres whose mission is to train young scientists in in vivo skills and advance such research throughout the UK. Ellie has been a volunteer school speaker with Understanding Animal Research since 2008 (and would wholly recommend it to anyone thinking of joining the scheme!) Her PhD involved the use of in vivo techniques to investigate the inflammatory response during endotoxaemia, for which she won the GlaxoSmithKline Young Investigator's Award at the most recent BPS Winter Meeting. She has now taken a job as a medical writer.

In January 2013, new UK legislation will come into force regulating the use of animals in scientific procedures. The EU Directive 2010/63/EU will replace the Animals (Scientific Procedures) Act 1986 (ASPA). On 27 April 2012, representatives from government, industry, academia, research councils, and communications divisions met in London to discuss the impact of these changes in the UK at the Time for Change Symposium.

The impressive turnout reflected how well the meeting was run, thanks to the hard work of Bella Williams at Understanding Animal Research and her colleagues at the BPS and Physiological Society. The atmosphere was informal and relaxed with engaged and frank discussion throughout – hopefully fulfilling the wishes of Chair Clive Page who opened the meeting. The main changes and key discussion points are outlined below.

About the New Directive

Judy MacArthur Clark of the Home Office delivered the keynote speech. She was followed by David Reynolds of the European Federation of Pharmaceutical Industries and Associations, Paul Brooker of Huntingdon Life Sciences (HLS) and Barbara Mortimer of the University of Bristol who gave perspective from industry, a Contract Research Organization (CRO) and academia, respectively. The afternoon session consisted of four workshops on the requirement for the new Animal Welfare Body (AWB) and National Committee; Communication Strategy; Revision of Schedule 1; and Accreditation Competencies. All were filled with lively and erudite debate, the salient points from which were fed back to Judy MacArthur Clark in a final discussion at the end of the meeting.

The keynote outlined the major changes that will take place when the directive comes into force: those that are definite and those that are still under discussion (see The Home Office's To-Do List and Timeline). The rules applying to housing standards will be delayed until January 2017, due to the cost, disruption and ongoing dispute over issues such as rodent cage sizes and stocking densities.

Much of the feeling was 'if it ain't broke, don't fix it' – and there is much about the current UK system that doesn't need fixing. Many of the Directive's requirements are similar to ASPA, although the Home Office and others in the field consider it an opportunity for review of ASPA. All speakers agreed that more simplicity and less bureaucracy is required; the aim is to distill the system into one that is more lightweight and flexible, but with the current robustness intact.

It is proposed that the Directive consists of three parallel sections: mandatory parts will be in bold text, EU guidance in regular text, and UK guidance in italics (see Anatomy of the New Directive). The latter section is hoped to be of particular use to new startups by providing good advice and relevant literature, as well as allowing evolution of the code as new scientific evidence emerges.

Personal Licences

The current UK system of licences and certificates works well in terms of high scientific standards; therefore there are no plans to significantly alter its approach and most changes will apply to terminology. Personal licences (PILs) are not a requirement of the Directive, but Article 23 states that individuals must be trained and competent (assessed via accredited courses). The new licences will involve training in range of core techniques, with more specific training added as required. A system of reassessment will be implemented (although the details have not yet been established), which will ensure users are up-to-date with their training whilst simultaneously affording more freedom and less paperwork. An e-submission programme for the simplified outcome-focused project licences (PPLs), currently on trial, should aid this further.

Training records must be kept for translation to other member states. This will afford greater freedom to researchers than under the previous scheme because licences will no longer be tied to a particular establishment (with the exception of a permanent address so that the Home Office knows where to send its bills!) In the final discussion it was mentioned that a centralized EU-wide training and competency register of people and courses would facilitate this freedom. A major concern amongst delegates was the assessment of competencies and their standardization throughout Europe.

AWBs and the National Committee

The role of the AWB laid out in Article 26, will be similar to the existing Ethical Review Panel (ERP) in that it will support PPL holders, provide advice on animal welfare and Reduction, Refinement and Replacement (the 3Rs) at a local level, and monitor training. Its makeup is less specifically defined than the ERP – it must include a Named Animal Care and Welfare Officer (NACWO), "input from a vet" and "a scientist" – and so may consist of active sub- or working groups, particularly in larger establishments. The academic opinion was that the role of the AWB would become diluted but there is nothing to

stop establishments from going beyond the Directive's minimum requirements. The AWB is unlikely to change much from the existing ERP system, then, with the caveat that it should "generate a vibrant culture of care" with a greater instilment of the 3Rs.

The new National Committee will replace the Animal Procedures Committee (APC) in advising the Home Office and AWB. Its major focus has still not been decided upon, although the Home Office is clear that they do not simply want a renamed APC. One delegate offered as a potential role "horizon scanning and capturing key issues of concern that have national importance – continuous or not – usually within a social context", which was particularly well received. Other ideas included animal acquisition and breeding, accommodation and care, and use and sharing of best practice. Membership has not been confirmed but suggestions included a core for general overview that can focus on issues and deal with them swiftly, with a range of experts available when necessary.

Inspection

The Directive's requirements for inspection are below the UK's current standards. David Reynolds and Paul Brooker stressed that the existing inspection practices should be maintained, as regular visits are deemed beneficial for establishments (through interactions with their inspectors) and for public confidence. Both felt that the new Directive should increase public confidence and help implement the 3Rs by focusing on outcomes of the research rather than techniques.

Communications/Public Confidence

Non-technical/lay summaries on PPLs will be more prominent and good for public confidence. Here also lies another chance to simplify the system, by shifting the focus of the PPL from detailed techniques to the balance of adverse effects with research outcomes. Barbara Mortimer raised an interesting point specific to academia, asking for clarity in Section 24 (the confidentiality clause) over whether institutions would be at liberty to release licences under Feedom of Information requests.

Most discussion on Communication Strategy came from the afternoon workshop, which started with a round robin introduction where everyone had to reveal a secret about themselves (including, but certainly not limited to, re-learning musical instruments, black belts in martial arts, and discovery of three new primate species!)

Many delegates stressed that public confidence will not happen by osmosis. Feeling was that the new legislation should not be put out quietly and instead the Home Office should provide chances for the scientific community to speak out about animal research. Judy MacArthur Clark warned that the Home Office must remain neutral, which would also give voice to the anti-vivisectionist groups. Despite this delegates were still keen to speak publicly on the matter – a sign of how far things have progressed since ASPA in 1986.

Protected Species and Schedule 1

Cephalopods will become a protected species. Their guidance document is still a work in progress, which was reflected in the Revisions to Schedule 1 workshop as delegates discussed the best way to recognize pain, distress, suffering and lasting harm and the best methods for killing. Many thought that overall, the EU proposals for the equivalent of Schedule 1 were poor. The UK will probably use an opt-out on anaesthesia or sedation for Schedule 1, or electrical stunning for cold-blooded vertebrates, again going beyond the Directive's requirements. A retrospective review was suggested in several years' time, recording the methods commonly used on each species so the Home Office could look to potential refinements.

Suppliers

HLS were unsure about accreditation of non-human primate suppliers (mostly based in Asia), and whether this would come from the UK or the EU. As HLS have a good relationship with their suppliers and have worked to improve standards through audits and visits, they are keen to develop the situation further through government approval.

Conclusions

Although the UK seems to be in a better position than other member states, we should avoid being complacent or patronising towards those who face a much tougher switch on 1 January. The UK still has a key hurdle to jump, as the Directive will be taken to the Houses of Commons and Lords in the autumn – as this is statutory guidance, Parliament can only issue a "yes" or "no" answer so the bill could still be rejected. Suggestions from the communications workshop included lobbying of MPs by researchers prior to the bill reaching Parliament, as was done with reasonable success in 2009 when it was first proposed. Several individuals also called for the Home Office to encourage buy-in from other governmental departments such as the Department of Health, which benefits from medicines developed through animal research.

Overall, the feeling is that we should see the new Directive as a chance to better our current system. There are still concerns over interpretation and implementation of the regulations, but the focus should be on welfare rather than bureaucracy so that the UK can continue to reassure the public of its high ethical standards together with its strong scientific research.

Acronyms

Our sector is full of acronyms, which doesn't help transparency. The communications workshop suggested cutting down on them to help make it more communications-friendly. Here is jargon you are likely to hear:

3Rs – Reduction, Refinement, Replacement [of animals in research]

AWB – Animal Welfare Board

APC – Animal Procedures Committee

ASPA – Animals (Scientific Procedures) Act 1986

CA – Competent Authority

CoP – Code of Practice

CTO – Competency Training Officer

ERP – Ethical Review Panel

NACWO – Named Animal Care and Welfare Officer

NVS – Named Veterinary Surgeon

NC – National Committee

PIL – Personal Licence

PPL – Project Licence

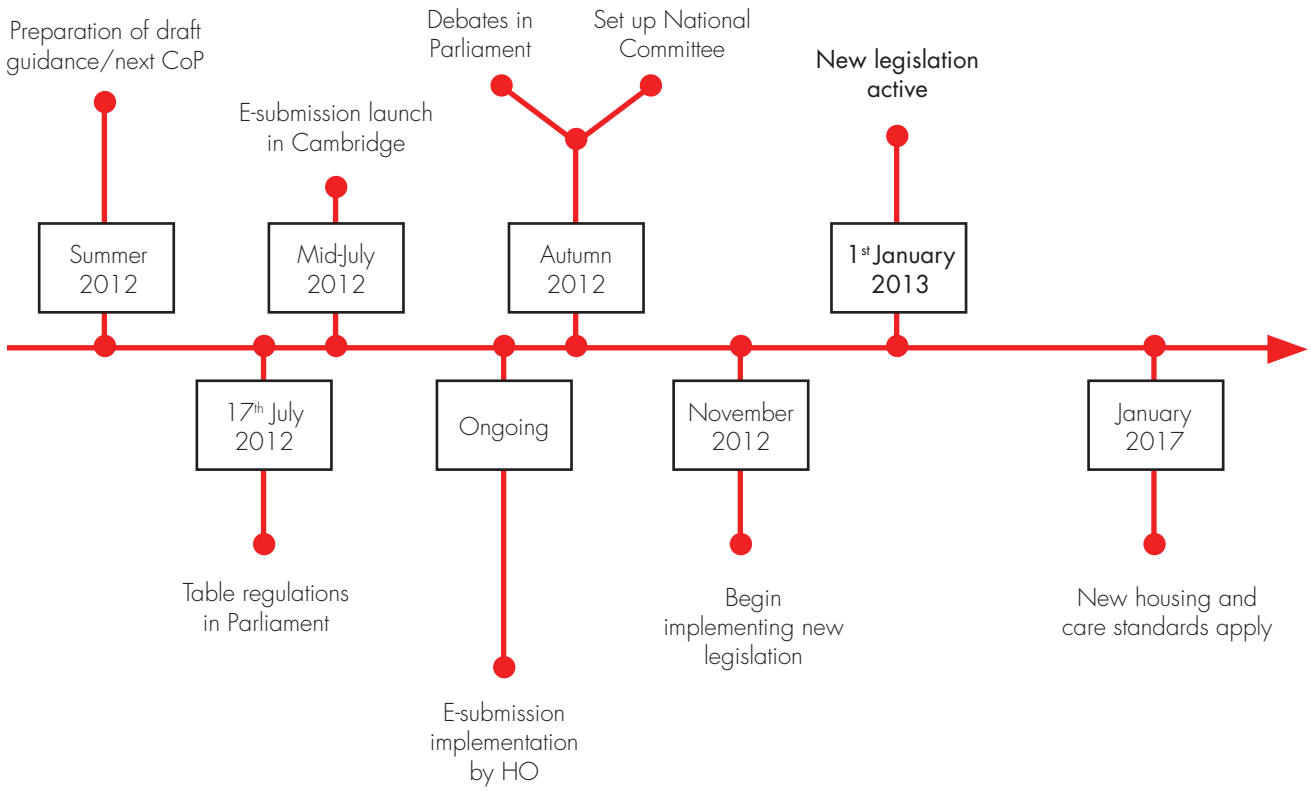
Table 1.

The Home Office's To-Do List

Activity	Status
Publish the government's policy statement in response to the public consultation	Underway
Take a view of the impact of the above statement	6-8 week window over summer
Complete draft regulations	~ 90% complete
Finalise Schedule 1	Underway
Update impact assessment	~ 95% complete
Clear impact assessment with HO Economist and Regulatory Policy Committee	Underway
Clear draft regulations with HO Affairs Committee	Awaiting completion
Review Section 24 (the confidentiality clause)	Date to be determined
Determine penalties for misconduct with Ministry of Justice	Date to be determined

Fig 1.

Timeline of changes to be implemented before EU Directive 2010/63/EU comes into place on 1 January 2013



Directory of European Pharmacologists – a call to arms

Professor J.C. (Ian) McGrath
Editor in Chief
British Journal of Pharmacology

There is currently no list or directory of pharmacologists working in Europe. This might be useful. There are many potential benefits from having access to a European directory of pharmacologists. New initiatives in promoting the discipline through promoting and sharing research skills and knowledge and best practice in training and education could all be much more effective if pharmacologists could be reached directly.

There is not even a list of those who are members of pharmacological societies. It is possible to obtain a list of such societies through their federation EPHAR but no one has attempted to collate the membership lists of the societies. This is, perhaps, an inevitable consequence of a federation. At a recent meeting between Executive members from EPHAR and BPS there was unequivocal support for the aim of achieving a Directory of European Pharmacologists, suggesting that wider consultation might achieve universal support in the continent.

How would we do it?

The obvious route is to ask the Societies, through EPHAR, to give The Directory access to their membership lists. There are two aspects that would need to be dealt with. Firstly it would need to be made clear who had responsibility for using the Directory and what for. Secondly, data privacy laws would need to be navigated. Basically each Society who agreed to participate would need to agree to email their members asking for permission to pass on their details. To keep it up-to-date they would then need to include this request with new member applications. Alternatively they could email all members asking them to reply directly to a specified address for the Directory.

But in the age of electronic communication, could we recruit them directly? We can't write to all the individuals because that is the point! We could advertise is some way – maybe through social media? Anything more conventional is likely to have too little potential for penetration. As Editor-in-Chief of BJP I would like to sign them/you all up as potential reviewers and we could have a tick box asking if you agreed to be part of the Directory (this does not to be limited to Europe), which gets round the snags of data law. This could also recruit people who are not members of the societies and even those who do pharmacology but do not realize it.

Perhaps best is to use all these approaches: ask EPHAR to ask Societies to seek permission to pass on members' addresses; set up an electronic directory address with a few simple questions; use whatever means we can to spread the word by social media;

I would be very pleased to hear from anyone with good ideas on how to do this!

Email address for JC McGrath via BPS (hom@bps.ac.uk)

A VOICE for UK Clinical Pharmacology

Jeffrey K Aronson
President Emeritus, British Pharmacological Society

Phil Routledge
President, British Pharmacological Society

A questionnaire study of consultant clinical pharmacologists has confirmed that they are hard working and highly productive in terms of mentoring, research, clinical work, and policy development (the MRCP of our discipline) [1]. In recent years the fortunes of clinical pharmacology in the UK have improved, although there is still some way to go before the discipline is as strong as it was in the 1970s and 1980s. Some recent positive outcomes have been described elsewhere [2], as has a manifesto for clinical pharmacology [3], which aroused some controversy [4].

Following these developments, and in order to prepare an agenda for UK clinical pharmacology for the next 5 years, the BPS organized a James Black Conference, which was held in Green Templeton College in Oxford on 20–22 June, 2011, under the collaborative banners of the BPS and the Royal College of Physicians (London), with funding from the BPS and additional generous financial sponsorship from Green Templeton College. The meeting attracted about 50 participants in all over the three days, mainly senior clinical pharmacologists and their junior colleagues, but also including other medical specialists, pharmacists, and even one microbiologist who had been tasked by his university to organize therapeutics teaching. They addressed the following broad questions:

- How should UK clinical pharmacology be further developed and delivered as a discipline in Universities, the NHS, pharmaceutical companies, and regulatory authorities?
- How should teaching and training in UK clinical pharmacology and therapeutics be delivered and assessed?
- What topics should be priorities for research in UK academic clinical pharmacology?
- How should clinical pharmacology contribute to UK drugs policy?
- How should pharmacology and clinical pharmacology be further integrated, to the benefit of both?

Feedback suggested that the meeting was successful, and almost all of those who gave talks at the meeting turned those talks into papers, which have been published in the British Journal of Clinical Pharmacology, both online and in a special June issue. Here we summarize the main recommendations that arose from the discussions, but the papers themselves need to be read individually, as they are rich in ideas for the future development of the discipline. The recommendations that emerged can be considered under the collective acronym VOICE, which stands for Visibility, Outreach, Integration, Coverage, and Emissaries.

The recommendations are summarized in Table 1 and are discussed in detail in the Editors' View article that prefaces the BJCP special issue. Here is a brief summary.

Visibility The visibility of the discipline needs to be increased. This could be done, for example, by increased activities in acute general medicine/toxicology, through activities of Medicines & Therapeutics Committees, participation in grand rounds, teaching and training, monitoring therapeutic interventions, and offering bolt-on training for other specialists (for example, short courses, MSc courses, training programmes).

Outreach Methods of increasing outreach include road-shows in schools/medical schools, national special study modules, public education, press coverage, and social marketing.

Integration Closer collaborations with pharmacologists, pharmacists, nurses, other prescribers, pharmaceutical companies (e.g. through joint training programmes) and regulatory bodies are desirable.

Coverage Attention must be paid to collaboration with areas in which clinical pharmacology has much to offer patients, such as general practice, paediatrics, obstetrics, geriatric medicine, anaesthetics, cancer and immunology.

Emissaries We should encourage trainees to spread the word to their colleagues and students about the importance of the subject and its intellectual attractions, and reward them for doing so.

This is work in progress. We know what might be done as part of our joint efforts as a specialty to further the discipline; others will have other suggestions. The next challenge is to decide how, and then to carry through these recommendations. The process has already started.

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- Aronson JK. Integrating pharmacology and clinical pharmacology. Br J Clin Pharmacol 2011; 71(5): 787-90.

Table 1.

Some recommendations for taking UK Clinical Pharmacology forward

End point	Some possible routes
Visibility	1. Acute general medicine/toxicology ("front-door" activities) 2. Activities and influence of Medicines & Therapeutics Committees 3. Participation in grand rounds 4. Teaching and training • Prescribing (for example, through the e-learning programme *Prescribe*) • Basic and clinical science • Research methods • Monitoring therapeutic interventions • Bolt-on training for other specialists (e.g. short courses, MSc courses, training programmes)
Outreach	1. Road-shows in schools/medical schools 2. National special study modules 3. Public education (for example, public lectures and advisory sessions) 4. Politicians 5. Press coverage (for example, through the Science Media Centre, newspaper articles) 6. Social marketing—blogs, websites (corporate and individual), tweeting
Integration	Closer collaborations with 1. Pharmacologists (perhaps through joint departments of drug development) 2. Pharmacists (through Medicines and Therapeutics Committees and joint teaching programmes) 3. Other prescribers (likewise) 4. Pharmaceutical companies (for example, through joint training programmes) and regulatory agencies
Coverage	Attention to various neglected areas, such as: 1. General practice (where 80% of prescribing occurs but there are currently few individuals with clinical pharmacology experience) 2. Paediatrics 3. Obstetrics 4. Geriatrics 5. Anaesthetics 6. Cancer 7. Immunology (for example, clinical pharmacology of biologics)
Emissaries	…to spearhead the above activities

Drug Discovery in the UK - skills for future success

Dr Mark Downs
CEO Society of Biology

There is great potential for learned societies to contribute to the preservation and development of drug discovery in the UK. Since the beginning of 2012, representatives from BPS, the Society of Biology and Royal Society of Chemistry, have been meeting regularly to establish a series of joint actions and communications, which seek to clearly set out that contribution to an audience of policy makers, those at work in drug discovery and development, and the public.

The group has collaborated on a collection of articles in Research Fortnight, the last of which, Drug Discovery in the UK - skills for future success, is reproduced below. You may find links to the other articles at the bottom of this page.

Jonathan Brüün, BPS Chief Executive

The pharmaceutical sector is changing. Some have suggested this is a disaster but in reality it is probably essential if the UK is to remain internationally competitive as a place to carry out leading-edge drug research. It clearly does create significant challenges as restructuring continues and we have already argued that Therapeutic Centres might provide one critical part of a future solution to retaining a competitive edge, preparing for expansion in the sector when the time is right. But what are the fundamental skills that will allow us to maintain our global competitiveness in medicines research during the period of uncertainty that change brings?

A good starting point may be a review of the way future drug discovery will take place. Crystal ball gazing is always dangerous but there are some fundamental changes, already taking place, which will shape the skills requirement over the next decade. Firstly, drug discovery will take place across multiple sites using the skills and experience of diverse groups. Making the interface work will be essential. That implies that it is no longer good enough to be an outstanding research scientist. To succeed in drug development the researcher needs to have strong communication and collaboration skills and a natural ability to network alongside project management capability.

Whilst we most definitely do need expert biologists, chemists and physicists there is a need to move away from traditional discipline boundaries as well, to capitalise on the ever increasing multidisciplinary approach to drug discovery. And, the artificial boundaries between clinical practice and new medicines research need to fall away completely. The private sector, academia, the health service, the voluntary sector and government must collectively be seen as integral to the process with an expectation that staff can move between them freely and easily. A lot is said about the need to support the interface between industry and academia but the reality remains that whilst academics can move relatively easily into the private sector the reward systems for academics makes the reverse extremely difficult. We have to find a way to reward the outstanding research capability of many scientists outside of academia that is more sophisticated than their research publication portfolio. Perhaps it is here that the Learned Society sector can add significant value through support for professional development?

Learned Societies have the breadth of membership and experience to help bring together continual professional development modules both directly and through their networks. This needs to be done soon: as pharma restructures there is a real concern that there will be a loss of the talent and skills uniquely found in their research labs. The Royal Society of Chemistry has already seen a 20% drop in the number of its members engaged in pharmaceutical research over the last three years. If these people are permanently lost, rather than redeployed, the skills will simply be unavailable to train the next generation. Common access to support routes across societies may well help and the Innovative Medicines Initiative education and training programme EMTRAIN could be a useful focus through their education and training activity as a gateway to available material, people and courses.

Of course, core skills based around practical scientific capability and data handling will also be vital in addition to the so-called 'transferable skills' described earlier. Target identification methods, biomarker and probe technologies, synthetic biology, toxicology, medicinal chemistry and computational methods are just a few examples.

At a recent meeting of over 20 Learned Societies focused exclusively on skills requirements for drug discovery of the future, a clear commitment emerged to ensure collectively we add real value. Some of the core actions arising include collaborative work around training modules, accreditation of degree programmes, development of professional registers such as those for technicians (and the accompanying CPD requirement), mentoring programmes, bursaries linked to work placements for students, strong advocacy about the sector overall (to encourage new talent) and the use of case studies to demonstrate the flow of private sector researchers into academia.

The UK currently has an enormously strong research capability in drug discovery with a wide spectrum of skills and experience. If we want to continue to lead this sector worldwide amidst changing ways of working and research it is essential that we retain core skills and add new capabilities if we are to be ready for the UK to take its share of future expansion of the pharmaceutical and biotechnology sectors, which must surely come?

Links

Keep making the tablets
http://www.researchresearch.com/index.php?option=com_news&template=rr_2col&view=article&articleId=1190844

Big Pharma is broken
http://www.researchresearch.com/index.php?option=com_news&template=rr_2col&view=article&articleId=1167132

News from the Young Pharmacologists

Hannah Watson
Young Pharmacologists Representative

There were several exciting events happening across the country over the last few months. Below are some that are most relevant to the Young Pharmacologists out there.

Young Life Scientists Symposium – "Future challenges for systems medicine" 27 June, Manchester

Last year, this symposium was a huge success and was fully booked well in advance of the event. Aimed at young researchers alongside clinicians, the focus of this one-day event was how best to translate clinical observations into multi-scale models of disease processes. There was particular emphasis on the importance of liaison between researchers and clinicians. This year was just as successful with some collaboration between some influential societies and institutions: the British Pharmacological Society (BPS), Biochemical Society, Physiological Society, and the University of Manchester Faculty of Engineering and Physical Sciences Research Conference fund. With the added bonus that the event was free to attend!

Focused Meeting on Neuropeptides, 7-9 June, London

This meeting, spread over 2.5 days, highlighted new research in the field of neuropeptides, including, talks and poster sessions of chosen abstracts. There were delegates from the United Kingdom, Europe and America, which made for a very educational meeting. The BPS offered bursaries for young scientists to attend this event.

New Projects for the Young Pharmacologists

As a group, we are keen to bring pharmacology both clinical and scientific to the wider audience. So we have started working on a number of projects that will be available later in the year. One such project is entitled: "How drugs work?". We are planning to develop short videos featuring members of the committee describing common drugs that the public may be interested to know about; as such they will be aimed at the wider community and will be available online. So watch this space!

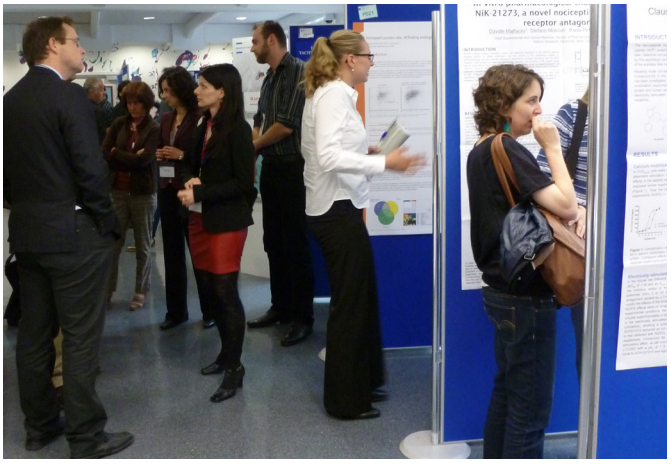
IUPHAR 2014

Although still a number of years away I would like to draw your attention to a cause that the Young Pharmacologists are very passionate about. The IUPHAR meeting will be held in South Africa and we would like to sponsor one, if not more, African researchers so that they may attend the event. To raise the required funds we are selling "I love pharmacology" T-shirts; they have proven extremely popular so far and are available at BPS events as well as directly from the BPS office. So far we have raised £2288. They are great value for money (£10) and will serve as a great souvenir from any BPS event you are attending. Please support us in this very worthy cause! Thank you to everybody who has already purchased a T-shirt; we really appreciate your support!

Congratulations to our Chair of the Young Pharmacologists Committee

We are fortunate to have had the support and guidance from Professor Jane Mitchell. She has been a very influential member of our committee and there are many projects that would not have been as successful without her compassion and expert knowledge. Therefore, the committee was delighted to hear of her success in winning the *AstraZeneca Prize for Women in Pharmacology* award supported by the BPS. This is a well-deserved honour, and the entire committee and beyond congratulate her on this prestigious award. Well done!

If you are interested in any of the above events please see the British Pharmacological Society website www.bps.ac.uk for further details and registration.



Delegates enjoying the poster session at our *Focused Meeting on Neuropeptides*

Congratulations to the Young Investigator Award winners

Our five-year strategy

Phil Routledge
BPS President

Humphrey Rang
BPS President-elect

Jonathan Brüün
Chief Executive BPS

About BPS

In July 1931, 19 pharmacologists met in Wadham College, Oxford to discuss the formation of a "Pharmacological Club". After discussion, the designation "Society" was preferred and for the 81 years since that first meeting, the British Pharmacological Society has responded effectively to the changing landscape in science, and has grown and prospered. Fifty years after the BPS was founded, we had grown from the original 38 members to 1,593 members. Now, for the first time, we have over 3000 members representing pharmacology and clinical pharmacology in academia, industry, the health service and regulatory agencies. With members in 60 countries, we are certainly an international organization.

Our mission statement

The aim of the Society is to promote and advance pharmacology, including clinical pharmacology. This aim is underpinned by several objectives, which are available on the website. Each year, Executive and Council review these objectives. However, we felt that there was a need to do more than this. We wished to plan for the future, taking into account the increasingly rapid changes in science and the research landscape. We considered that the Society should develop a strategy that could focus our efforts on the challenges and priorities for the next five years.

Developing our strategy

BPS Council, Sectional Vice Presidents, Young Pharmacologists and senior BPS staff met in Brighton on a Strategy retreat in early March 2012 to review progress made by the Society over the past four years, and to consider plans and priorities for the next five years. The proposals were discussed in depth at BPS Council on 20 March 2012, and five key priorities were agreed. These priorities are listed below, and will form the core of the Society's strategy over the five years to 2017, subject to review in 2014.
This strategy will determine the basis for the work of the Executive and constituent committees over this period. Although the key priorities for activity are summarized below, more detailed implementation plans will be developed in the next three months by relevant Honorary Officers and Society staff.

Key principles

Two overarching principles to be taken into account, when considering all future BPS activities were identified, namely achieving financial resilience and secondly, further development and modernization of the Society's equality and diversity policy to incorporate best practice into all the Society does.
The strategy will only be useful if there is full engagement by members, and if you are not already involved in the Society's activities or its Committees, we would encourage you to participate. With your support, we look forward to an exciting future for pharmacology and for the Society.

Phil Routledge, BPS President
Humphrey Rang, BPS President-elect
Jonathan Brüün, BPS Chief Executive

Our Key Priorities

1) Development of an integrated publications strategy
2) Greater matching of the Society's activities to the needs of the Membership
3) Explaining the importance of pharmacology in the modern world by extending BPS outreach activities
4) To reflect the increasingly multi-disciplinary nature of modern biomedical science by further developing BPS's collaborative activities with other Societies.
5) BPS should maintain its central position in the promotion of clinical pharmacology, the promotion of safe and effective prescribing, and in the discovery and development of medicines in the UK

Our Strategy for Achieving Priorities

Development of an integrated publications strategy:

Short term

- Review of the Society's Open Access policy in response to changes to the external landscape
- Development of an Open Access journal (earmarked for launch in April 2013)

Medium-long term

- Assess the changes in the external publishing environment (e.g. the Open Access movement, online only publication) and make recommendations to ensure our journals can meet the corresponding challenges and opportunities while maintaining a healthy income for the Society

- In light of the impact of inter-disciplinary studies, our journals should create corresponding content (e.g. through Virtual Themed Issues and other publications both between BJP and BJCP and with other journals)

- There is currently an array of platforms hosting BPS products and services e.g. BJP / BJCP (Wiley Online library); Guide

  to Pharmacology (Edinburgh University); Prescribe (Aberdeen University); PSA (Edinburgh University); PharmaCALogy (obsolete software): an integrated strategy may be useful

  - Research and make recommendations on the viability of a 'one stop shop' approach to the hosting of our publications and related services, and the enrichment of online journal content (e.g. through CPD or intelligent tagging).

- Raise the profile, visibility and ultimately impact factor of both journals

Greater matching of the Society's activities to the needs of the Membership:

Short term

- Development of a comprehensive strategy to recruit and retain members, by the following methods:

  - Membership engagement survey, to include meetings survey

  - Establishing a programme to tailor BPS member benefits to individual constituencies

  - Establish a new member database matched against the needs of the departments within the BPS and able to provide greater information on specific segments of the membership

  - Promoting career –long membership of the BPS

- Conducting a governance review (including recommendations to improve inter-departmental/committee co-ordination)

- Incorporating market research principles and greater member engagement in the planning of scientific meetings

Medium-long term

- Encouraging members to become more involved in the Society through its committees to aid with succession planning. Demonstrating transparency and openness will be essential.

Explaining the importance of pharmacology in the modern world by extending BPS outreach activities:

Short term

- Extending BPS outreach activities to a wider audience to explain the importance of pharmacology in the modern world (e.g. schools, general public, policy makers, membership – now an essential component of grant applications plus consideration in the Research Excellence Framework (REF). In support of this, BPS will:

  - integrate existing resources e.g. pharmacology practicals, downloadable careers resources, videos of previous outreach events in a central hub

  - create further resources for new audiences e.g. slide sets, teaching resources, development of on-line animated demonstrations

- To research and develop appropriate metrics to evaluate impact of investment in extended outreach activity

Medium-long term

- To evaluate effectiveness and impact of these initiatives with the target audiences

To reflect the increasingly multi-disciplinary nature of modern biomedical science by further developing BPS's collaborative activities with other Societies:

Short term

- The BPS should create a culture of collaboration in the sector rather than isolation. We should be joiners not splitters!

- Continued engagement with the Society of Biology is a priority

  - In the BPS's relationship with the Society of Biology it should always be clear about what pharmacology uniquely brings to the table, to avoid dilution within a broader biology agenda

Medium-long term

- BPS should prioritize improved engagement with other disciplines e.g. Chemistry, Toxicology and Pharmacy, to reflect the increasingly collaborative nature of pharmacology and promote multi-disciplinary science via meetings, journals output and education

- The Society should continue to engage, though with a lower priority than in the past, with international pharmacological partner organizations, to maintain the Society's position as the leading pharmacological Society on the global stage

BPS should maintain its central position in the promotion of clinical pharmacology, the promotion of safe and effective prescribing, and in the discovery and development of medicines in the UK:

Short term

- To initiate a plan of work to identify industrial and academic skills gaps as they arise, and provide and develop appropriate training in collaboration with partner organizations

Given the potential contribution of safer prescribing to the health of the UK public, BPS must continue its commitment to the development, delivery and support of *Prescribe* and the Prescribing Skills Assessment (PSA)

BPS | BRITISH PHARMACOLOGICAL SOCIETY

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GPCRs: Mutations, Polymorphisms, Drugs and Disease

Translating Novel Anti-Cancer Strategies into Man

Wednesday 19 December

Pharmacology of Pattern Recognition Receptors

New Drugs Targets for Cardiovascular Disease

Cancer Mechanisms for Effective Targeting

Thursday 20 December

Raising the profile of Pharmacology through public engagement

Emerging Pharmacology of Prostaglandin EP Receptors

New Targets in Oncology: Stem Cells, Signalling and the Microenvironment

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w: www.bps.ac.uk/meetings/BPSWinter