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**SEB**

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**Bulletin**

March 2010

**SEB@Prague**

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# SEB Bulletin March 2010

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A rich community of Antarctic Marine invertebrates on a rock wall protected from iceberg scour. Many species show adaptations to the high variability in photoperiod and primary production.

Taxonomic groupings: sponges, cnidarians, ascidians, hydroids, brachiopods etc  
Location: Anchorage Island, Ryder Bay, Antarctica.

*Photograph by Jon Withers, BAS  
Original image rotated 90° anti-clockwise*



Want to see more news?  
Go to [www.sebiology.org](http://www.sebiology.org)  
Our website is regularly updated

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For the first time since I became editor of the SEB bulletin and started writing the editorial pages over 10 years ago I'm going to do something self-indulgent. I'm going to pay tribute to my dog, Dimitri, who shared my office (and my life) until his recent death on the morning of 31 December 2009. He was a wise old boy; calm, accepting, grounded. At lunchtime we would go out and he would ensure I always got my exercise and fresh air. If I was working late at the office he would come over and push my hands off the computer keyboard with his nose to show me he'd had enough and needed to go home for his dinner.

The expression "It's a dog's life" has been around since 1660 (so Google tells me) and meant then 'a miserably unhappy existence'. At that time, most dogs did live a rather miserable life and other expressions such as 'dog eat dog', 'dog tired' and so on, arose from observations of the life of the average dog in those days. Times have changed, however, and I would say that Dimitri's life was far from miserable or unhappy. In fact, he lived a charmed life in which he was never on his own and had all his needs cared for so that a more modern definition of "a dog's life" for him is probably more accurately described as the antonym of the original definition which literally translates to: 'a happily happy existence'! He took life in his stride with an ever optimistic go-ahead view of the world - he was an inspiration.

Back here in the present it seems that hard times are ahead. Universities and research institutes look set to endure financial cuts, cut backs, redundancies, undue pressures from above and below; the unfair results of an unfair world. Things have always been this way it's just that now we are in the direct firing line; we are experiencing the follies of government

policy, short-term thinking and global forces/markets - whatever you want to call them. It is bound to affect everyone in research and academia in some way or other in terms of funding, student numbers, academic, postdoctoral and doctoral posts, as they are sacrificed to claw back the 'lost' billions.

How we react to the 'down-turn' is up to us. We could take the traditional 'dog's life' view and take on 'hang dog' expressions or we could be more upbeat and hopeful. In his first President's letter (page 4), Pat Heslop-Harrison cites our Main Meeting as the ideal place to keep and build on research networks and information - the programme of plant, animal, cell and education sessions available to delegates at this year's meeting in Prague will provide an ideal forum for this purpose (pages 12-22). The Education & Public Affairs Section chair, Jeremy Pritchard, provides a positive look at the Impact Agenda (page 8), followed by reports of new teaching tools from Gatsby Plants and *The Plant Cell*, and even the usually cynical Dr Workhard is taking his departure in his stride (page 34).

And if you feel inclined to proffer influence at the higher policy levels, I am pleased to tell you that the SEB regularly receives policy consultations asking for our members' opinions on key issues such as education, energy, funding, research skills, etc. for which we welcome your views to collate and pass forward. And further than this, returning to my original tribute, why not take a leaf out of Dimitri's dogma and consider this final piece of light-hearted advice: "When please doesn't work ... beg!"

**Sarah Blackford**  
Editor

# From the President's desk



As members of SEB, we are all involved with the dissemination of the science we do – experimental biology. But in the connected world, what is meant by dissemination? How do we go about promoting and increasing the influence of experimental biology within the scientific community? If you think about where you find out about experimental biology – your own areas of interest, and the subject in its much broader context – the answer “primary refereed Journals”, is probably the first response to this question. However, if you are anything like me, key sources of information about what is happening – the breakthroughs, the details and the controversies – will come from a wide range of other sources. While information overload is infinitely preferable to information deficit, how do you filter the amount of information which could reach each one of us? The number and nature of the information sources available to experimental biologists is changing incredibly rapidly and, what’s more, each scientist will have chosen different options from the dozens available.

A few years ago, a weekly trip to the library to browse a small number of Journals would cover most of one’s needs; now, I subscribe to about 20 tables of contents from publishers but a small fraction of the papers I read and use come from these and, for peripheral areas, none at all. For a while, review journals were important to me – I used to eagerly await each issue of the various Trends in XXX and Nature Reviews YYY, but somehow

they passed from my radar several years ago, with lack of focus and lack of speed. Much more recently, but very short-lived, were RSS feeds – the rate of e-mails popping up in the corner of my screen was more than I could cope with, let alone filtered paper titles. Now, I choose to receive many newsletters, discussion group postings, and other review-type alerts, many of which not only point to the primary articles, but have a short summary, ideally concentrating on the consequences of the work as much as the results which are present in the abstract. More often than not, the pointer is all there is time to read. I also receive titles from several keyword searches on a weekly basis, and the versatility of these is increasingly usable. I’m a member of a couple of useful groups on LinkedIn related to the applied end of my research, but I have yet to find really useful, research-oriented Twitter, Facebook (where SEB has recently started a group), or other feeds that meet research needs and are at an appropriate level. I hope somebody reading this will suggest some worthwhile sources! Of course, for one-off searches, despite Web-of-Science/ISI ever improving, it is hard to beat Google or Google Scholar for a quick check of almost anything, with the instant measure of times-cited to suggest key papers in an area.

Interestingly, science-by-press release seems to be on the decline. If you believed the releases, you would think that all the model species and half the animals and plants in agriculture had been sequenced: I am pictured in this first SEB president’s letter with six of the eight plant species that actually have been sequenced (maize and soybean are missing). While perhaps fewer of us really browse journals today, the role of editors in choosing papers relevant to their readership is perhaps even more important than that of a decade ago. Many of us have been emphasizing to anyone (whether listening or not) how important it is that science is backed up by rigorously reviewed papers in primary Journals. The message seems to be getting home: an increasing number of major media stories (whether from the Daily Mirror, New York Times, Le Monde,

Frankfurter Allgemeine, or on the BBC), make clear reference to the refereed source of the report. In contrast, search Google for ‘oil palm genome sequence’ and you will find the same press release on dozens of sites, but no publication in any recognized Journal, or major newspaper. So it looks like we as scientists have done pretty well in getting the importance of review across, although perhaps the latest evidence for this came as a surprise: As I write, the IPCC climate change panel and its Chair are in trouble for quoting non-reviewed works including a student dissertation, New Scientist and a mountaineering magazine as sources in their reports. Interestingly, related articles have raised the issue of the quality and nature of peer review from an obscure topic discussed by scientists to the front page of newspapers worldwide.

Of course, my thoughts on dissemination to peers and public bring me back to the SEB and the role of conferences in dissemination. Conferences should be all about conferring, but increasingly many seem to be dominated by the ‘airport professor’ - where the speaker comes in to present their talk at you, with no sign of the people who did the work. The other type of conference or workshop can be very specialised – great if your topic is Z-channel over-receptor polymorphisms, but not always ideal if you are looking for a faculty position or for different ideas. At SEB our session organisers work very hard to ensure conferences are for conferring, and we try to make space in the programme for plenty of opportunities for discussions and networking, with everyone having the chance to present talks or take part in high-profile poster sessions.

I’m looking forward to seeing most of you in Prague – a conference site that could have been designed for us with rooms arranged around a large social and congregation area which will include the posters, and that’s before I think about some of the best beer anywhere.

**Pat Heslop-Harrison**  
Honorary President

## Applications for the 2010 L'Oréal-UNESCO UK and Ireland For Women In Science fellowships

L'Oréal UK and Ireland, the UK National Commission for UNESCO, the Royal Institution of Great Britain, and the Irish National Commission for UNESCO, have partnered together to provide a dedicated UK and Ireland For Women In Science Fellowship Programme for women scientists at postdoctoral level to enable and/or facilitate promising scientific research in the life or physical sciences.

Four Fellowships will be awarded in 2010 to outstanding female postdoctoral scientists to assist them with their research.

**Visit [www.womeninscience.co.uk](http://www.womeninscience.co.uk) to apply**  
**Closing date for applications is midnight (GMT) 7 April 2010**

## Plant Temperature Response Networks Meeting Durham, UK, September 2009

The north east of England was the setting for the first UK Plant Temperature Response Networks meeting, organised by Heather Knight (University of Durham) and Kerry Franklin (University of Bristol), in the Cathedral city of Durham. Delegates congregated at the University college of St Aidan's for a 2 day workshop exploring the impact of temperature on plant function. The aim of the meeting was to bring together UK scientists working on diverse aspects of temperature signalling in plants in the hope of identifying common research goals and strategising future research direction. Diversity was achieved with a mix of seminars and posters, integrating molecular approaches with whole plant physiology in both the model *Arabidopsis thaliana*, and a variety of crop species.

The meeting was well supported with a full house of 50 delegates in attendance. Conference costs were kept to a minimum through generous sponsorship from The Society of Experimental Biology, The Plant Journal and New Phytologist. An important and popular feature of the meeting was the

The Fellowships, each worth £15,000 (equivalent € for candidates in Ireland), are tenable at any UK or Irish university or research institute to support a 12-month period of research. The fellowship money can be spent in any number of innovative ways to enable women scientists to further their careers and facilitate world class research - such as buying equipment, paying for childcare or funding travel costs to an overseas conference.

Early Career Scientist's forum. In this session, an evening wine reception was combined with informal pre-dinner presentations from PhD students and postdoctoral researchers working on a variety of temperature-regulated responses. Topics covered plant temperature perception, temperature regulation of plant architecture, acclimation to cold and heat stress, interactions between temperature and the circadian clock and the temperature-regulation of flowering and bud development. Presentations provoked lively discussion, forging new collaborations and strengthening a research area currently displaying considerable expansion within the UK Plant Science community. For a full report of the meeting, see Franklin KA and Knight H (2010) Unravelling plant temperature signalling networks. *New Phytologist* 185, 8-10.



## SCIENCE COMMUNICATION INTERNSHIP 2010

The Society for Experimental Biology is offering an internship for a postgraduate student/early career scientist to gain a month's training in press and publicity during the period 7th June – 3rd July 2010. The placement will be suitable for someone who is seeking a career in science journalism, scientific administration, or as a publicity officer. Applicants with some experience of non-academic science writing will be given priority.

Working under the guidance of the EPA officer, the main activities will be: To write press releases for the SEB's Annual Main Meeting (Prague, 30 June – 3rd July 2010) in advance of the Meeting. You will be expected to review the meeting abstracts, talk to session convenors and interview speakers in order to produce interesting, eye-catching press notices. To send out the press releases to the media using Eurekalert and email.

To attend the SEB Meeting in Prague as its Press officer: to liaise with journalists and science editors, organise interviews, take publicity photos, attend relevant talks and visit posters, and write additional news for release during the meeting. To assist in the organisation and running of the EPA programme during the Meeting when required.

You will need to be self-motivated with excellent communication and time management skills. You will be given the option to work remotely for the most-part of the internship if it is not practical for you to absent yourself from your research full-time for one month. However, you will be expected to visit the EPA office initially to liaise with the head of EPA and remain in close contact throughout the duration of the placement. You will also attend the SEB Meeting full-time from 30 June – 3 July inclusive. All reasonable travel and accommodation expenses will be paid. This is an excellent opportunity to further develop your experience of science communication (previous winners have secured jobs as news editors, science writers and publicity officers). To register your interest for this post please email Sarah Blackford, with your CV highlighting your science communication experience and skills, and stating why you are applying for this post.

[s.blackford@lancaster.ac.uk](mailto:s.blackford@lancaster.ac.uk)

Closing date: 31st March 2010.



# SOCIETY OF Biology

## Society of Biology - the first months

The UK Society of Biology formally came into existence on 1 October 2009 following the unification of the Biosciences Federation and the Institute of Biology. Although we plan to build on the heritage of these two important bodies it is important for all of us to see the Society as a new organisation with a different outlook and approach to its organisational parents. For the first time we have one body to represent the interests of all biologists in the UK creating a single powerful voice to advise and inform Governments and make a difference. That aspiration can only be realised if we are a nimble organisation, quick to respond to opportunities, capable of learning from our mistakes and willing to work in partnership. We also need to be truly proactive to really drive the policy agenda.

At the time of writing this article we will be less than six months old and there will still be plenty of opportunity to shape the way we work. But, to do that we need to understand what matters to our members, how you will judge if we are delivering for you and how best to involve you. Any member of the team here would be delighted to hear your thoughts and, as the newest recruit, I am particularly keen to learn about the way your organisation would like to be represented by us.

### Our Council have identified four priority areas for 2010:

Firstly, practical biology. No matter which biological discipline undergraduates or postgraduates follow there needs to be the opportunity to practise science at the bench or in the field. It is simply not tenable to expand undergraduate science education without additional resource to facilitate hands-on experience of

designing real experiments and interpreting the results. There has to be the resource to properly fund practical biology both in schools and in the higher education sector. We will be pushing this message at every opportunity, especially in the run up to the election.

Secondly, the impact of biology, a central theme in the recent consultation on the Research Excellence Framework. Most biologists accept that the public have a right to know that the money they spend on research is being spent wisely. Its impact on our economy, health care system, environment and society is important to recognise. But it has to be a sophisticated measurement. We plan to build on existing work and present a consistent and clear case around the impact of biology from blue sky research to the most applied. Case studies will be an important part of that. If you have data or views to share please email me at [markdowns@societyofbiology.org](mailto:markdowns@societyofbiology.org).

Thirdly, we will continue to work on a pilot accreditation programme to report back to the Office for Life Sciences. The Government has asked us to look at ways in which some biological science degrees can be accredited to give greater confidence to students and employers that they provide the solid grounding needed for employment. There is no doubt that the topic arouses strong views. The academic community doesn't want to be forced into a corner with no room for innovation in their degree programmes or to become a surrogate for technical training programmes, whilst industry bemoans the lack of hands-on laboratory skills of many graduates. I am convinced there is a route to delivery of a solution that meets the needs of both camps. A lot



Mark Downs  
Chief Executive, Society of Biology

rests with the terminology used. Any accreditation programme we take forward will benefit from wider consultation and will certainly not be compulsory. It is likely to focus on core requirements for biological science courses to be accredited, such as numerical content, experimental design, opportunity for hands-on experimentation and intellectual rigour. It is certainly not about accrediting individuals or asking for coverage of specific training tasks or a defined list of techniques. For sure, biology is more diverse than chemistry or engineering, but by starting in specific areas real benefit can accrue, along with experience. To find out more visit [www.societyofbiology.org](http://www.societyofbiology.org)

Finally, we will of course be talking to all the parties in the run up to the UK General Election, forcing them to focus on their science agenda and representing the interests of biology, raising its profile and using our work on "impact " to argue for investment.

The Society will also be working on many wider education, science policy and public understanding of science issues and, of course, trying to evolve new services to benefit our members. We welcome your suggestions for the Society.

Mark Downs  
Chief Executive, Society of Biology

# Agriculture: Africa's Engine for Growth

## "Plant Science and Biotechnology hold the Key"

### Rothamsted Research (12-14th October, 2009)

Hunger and the cycle of poverty in Africa are two of the most significant developmental challenges that the world currently faces. Agriculture is considered to be an effective driver of growth in the world's poorest countries. It is widely accepted that raising agricultural productivity is essential for reducing rural poverty, enhancing food security, and stimulating broad-based economic growth but the productivity of African agriculture remains low. At present, the lack of scientific innovation in African agriculture hampers economic and social development. This three-day international symposium brought together about 100 scientists from Africa and the rest of the world in order to examine how new advances in plant science research and developing technologies are being used to the benefit of African agriculture.

This symposium was organised in collaboration with the Association of Applied Biologists (AAB) as part of our on-going capacity-building programmes in Africa and within the context of Africa College (<http://www.africacollege.leeds.ac.uk>) at the University of Leeds and the BBSRC "Excellence with Impact", initiative. The structure was based on our experiences of the career development needs of African Scientists. Thus, scientific excellence was at the heart of the symposium and a main aim was to bring more young African researchers into the forum of main stream science. Our aim of attract equal numbers of participants from Africa and the rest of the world was achieved, as was our goal of funds to cover the costs of participation for approximately 50 researchers from Africa.

This forum allowed a full and frank consideration of the roles of novel, dynamic, and relevant technologies and their possible applications in agriculture. It was widely agreed that although improvements in farming practices and crop management are essential modern genetics must be utilized too. Intensification of global synergies and alliances are further required in order to apply multi-disciplinary approaches and make prudent and timely recommendations regarding areas of highest priority for translation of modern plant sciences to the field, as well as devising appropriate actions on key activities in crop improvement. The need to enhance education in the new areas of plant research and biotechnology was finally also addressed as was the key question of whether plant science and biotechnology hold the key providing suitable solutions for Africa. The consensus view was clear: plant science and biotechnology may not completely "hold the key", but these areas are certainly an important part of the solution, as is the need to develop feasible strategies for generic translational pipelines for introducing genes and traits required for improvement of agricultural crops.

The Society for Experimental Biology offered support to the Education & Public Affairs section of the Symposium by sponsoring the participation of Ingo Potrykus to deliver an educational talk to local school students on the development and implementation of his Golden Rice project. If you would like to see Ingo Potrykus' lecture please go to: <http://www.africacollege.leeds.ac.uk/knowledge.php>. In addition, Sarah Blackford (SEB) and Aurora Levesley (Gatsby Plants)

interviewed speakers in order to disseminate a broader picture of their research to the public via a professional video which will be produced by Juan José Lopez and published on the SEB website in due course.

All of the presentations and posters will be published together in a volume of the Aspects of Applied Biology series and, in addition, we are producing a Special Issue of the *Journal Experimental Botany* to celebrate the fundamental and applied research achievements of successful collaborations involving African scientists and leading research labs around the world. This will be available in early 2010. These volumes bring together the expertise and enthusiasm of the participants in this international symposium and provide a state-of-the-art overview of key topics in the field. The chapters provide up-to date insights into the prudent application of recent and prospective biological advances in plant science and biotechnology and show how they can contribute to the "sustainable intensification", of agriculture.

Finally, as this Symposium was such a success, we hope to organise a second in this series in two years time. We hope also that the publications arising from the meeting will provide interesting and thought-provoking insights in new areas of plant science research and its implementation and that this will prompt further experimentation and breakthroughs in this important field.

**Christine H. Foyer** (Africa College, Centre for Plant Sciences, University of Leeds, UK)  
**Karl Kunert** (FABI, University of Pretoria, South Africa)



# IMPACT

## A force for good?

**Impact.** The word is loaded with strength, conflict, aggression: the impact of sword on shield; impact craters; impact centres repairing crashed cars. All give negative impact to the word. The revised UK RAE REF\* is now giving 'Impact' more of a bad press as it is hijacked to describe the outcomes of research projects. The new impact statements no longer require scientific endeavour to be the blue sky, slow burner; instead it's the cash in hand, value for money and sooner-than-later approach. The debate is now raging; we as research scientists do not want this predictive restriction on our work.

The trouble is, the debate about what exactly is impact is a tricky one. With apologies to Descartes: if we do research and no one hears about it, did we do it? As part of society, scientists implicitly accept the social contract. To misquote Hobbes: "without the social contract the life of a researcher is nasty, brutish and short". We receive the research funds, but what do we contribute in return? Impact can be many things: as Experimental Biologists we ponder and intervene to find out how the world works; this is surely enough? The physicists may mutter about the value of the non-stick frying pan, but those who designed the Hadron Collider are frank; they are probing the very nature of the Universe and this is impact enough.

Ultimately the purse strings are held by the public. Their taxes are apportioned to 'deserving causes', including our research programmes - deemed to be of worth. Arguably what is worthy is judged ultimately by the 'man-on-the-street' as the political wheel turns full circle and his vote is solicited. If he thinks that probing the nature of the Universe is good use of his money then sufficient impact is achieved.

Consider a list of hypothetical research projects and rank them by impact: A programme that identifies a cure for

cancer is undoubtedly research of high impact. Similarly, designing and producing plants that clean up pollution is also a 'good thing' and money well spent. But what about identification of a transcription factor that regulates the size of a fish tail? Or a project which investigates the sex ratio of spider mites? Or the effect of temperature on proteins in the poplar tree? A little thought quickly identifies the impact of these studies. Different size fish tails might improve aquaculture; regulating spider mite sexes could lead to better pest control; plant response to temperature will inform conservation strategies. All these are potential impacts, but is their use explicit in the minds of the scientists and wider society?

With apologies to my mechanical colleagues, a project designing a ball bearing that lasts longer is useful and has clear impact, but does not fire the imagination in the spectacular way that putting a man on the moon did. Spare a thought then for our Arts friends. Impact may be occasionally tricky for the Bioscientist, but what is the impact of research exploring the motif of rain in Jane Eyre, or the use of the subjunctive in medieval French poetry? But justifications of impact are equally valid for these researchers. If we scientists do not want to be constrained by the rigid market-driven criteria, we must bolster our arguments in similar ways to these areas of research. Such studies have uses in defining the language of equality or in the lucrative world of advertising. But there is a deeper more fundamental justification; they are important because they give people pleasure finding things out learning is an indivisible part of the human condition, we need to know, and 'we' means everyone. There is more; in striving for that knowledge pleasure pay-off we gain and refine our skills, we learn to learn impact that satisfies both the knowledge and skills agendas.

As a research community one of our roles in society is to produce near-market knowledge. But this must not be the only purpose, since telling people about our science also justifies our existence. If you talk about your work - perhaps to schools - you are enthusing, informing and directing the next generation of scientists. In a university you are also part of the hard-nosed student recruitment process by proffering the excitement of research to attract motivated students to your courses. Explaining your research to the general public is also important, this might be criticised as 'mere' teaching but in the impact debate no one questions whether school teachers must justify their impact. The impact of teachers is both implicitly and explicitly obvious.

So it is not yet clear how the impact of the REF will be formulated or used. However, whatever the outcome, science and science communication is increasingly important. The SEB takes impact seriously, indeed it always has. It's just that now it's on the radar and is being more clearly defined in all its different ways. The SEB has clear strategy in this area co-ordinated by our Education & Public Affairs (EPA) Section with input from our other three Sections. If you don't 'do' impact yet, look out for activities and resources available to SEB members. Define impact however you want, do it yourself or do it by proxy, but do it!

**Jeremy Pritchard,**  
*Chair, SEB Education & Public Affairs  
Section*

\*The UK Research Assessment Exercise has been replaced by the Research Excellence Framework see <http://www.hefce.ac.uk/Research/ref/>

For further information go to: <http://www.timeshighereducation.co.uk/story.asp?storycode=408774>

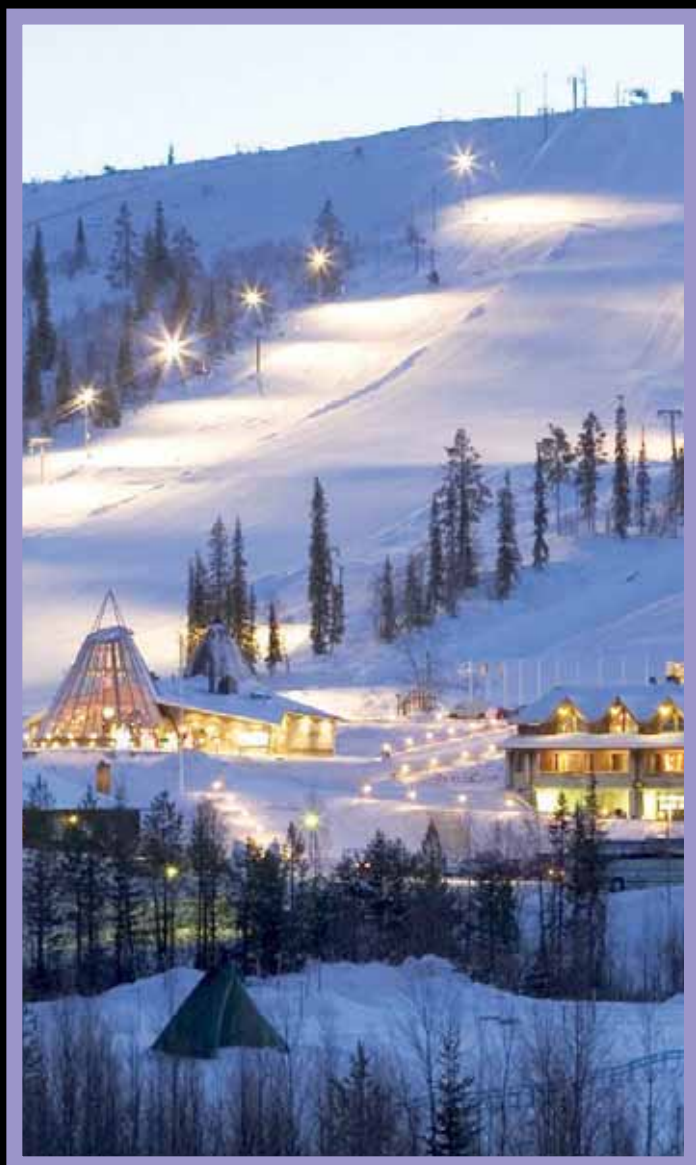
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**epsos**

**Conference**

# Plants for Life

**Olos (Lapland), Finland**

**18-22 April 2010**



## **Science policy**

*Plant science in Europe and beyond*

## **Science and society**

*Food security and safety – challenges ahead*

## **Achieving sustainability**

*Crop genomes for sustainable agriculture  
Breeding tools and strategies*

## **Achieving quality**

*From plant architecture to traits  
From photosynthesis to solar fuels  
Tree biology for multiple uses  
From metabolites and recombinant proteins  
to plant-made-pharmaceuticals  
Plants with improved nutritional quality and value*

## **Strengthening the functioning of ecosystems**

*Plant health  
Climate change and plant production  
Climate, Ecosystems and Genomics  
Biodiversity*

## **Confirmed speakers**

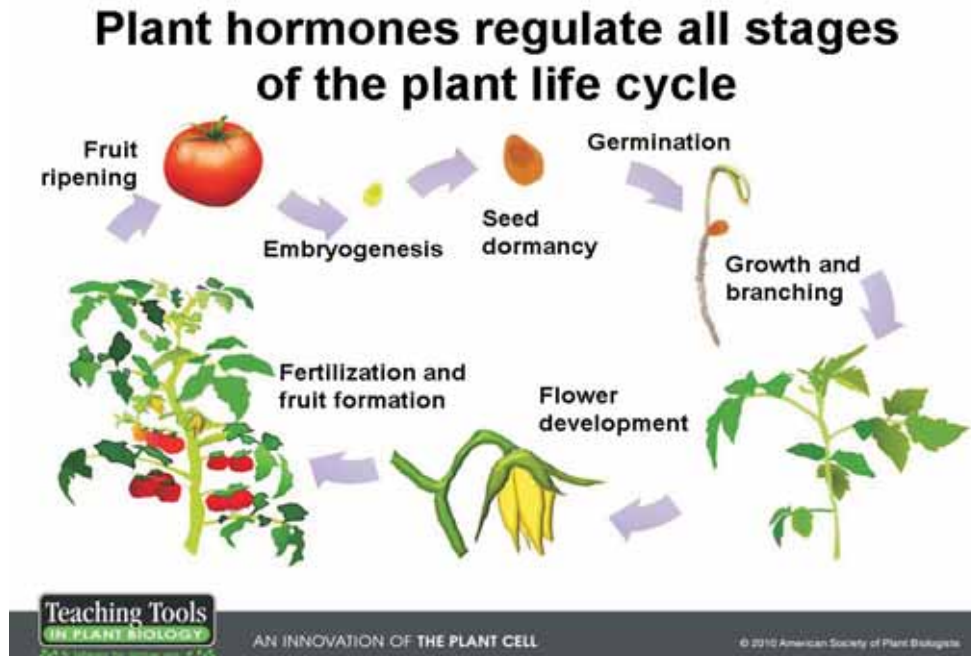
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Chiara Tonelli, Jan Traas, Gerald Tuskan, Robbie Waugh,  
Tom Whitham, Rod Wing, Ian Woodward, Dani Zamir*

**Coordinators: Karin Metzloff, EPSO and Kirsi-Marja Oksman-Caldentey, VTT, Finland**  
**Information and registration at [www.epsoweb.org](http://www.epsoweb.org)**

# Teaching Tools in Plant Biology - a new feature of The Plant Cell

Communicating the how and why of plant biology is extraordinarily important but increasingly difficult. A secured, nutritious diet is the most fundamental requirement for human health, yet funding for plant science research is dwarfed by that of medical research, and the public perception of the tools used to improve plant yields and nutritional value seems influenced more by superstition than by wisdom. Plant scientists today have tools and techniques that expand knowledge at an unprecedented rate. We observe ever smaller molecular actors following ever more complex scripts, but the gap between what we are learning and the level of scientific literacy is enormous. When describing our work we have to be prepared to explain both the forest and the trees.

Professional societies and scholarly journals exist to facilitate communication. As part of its ongoing commitment to the communication of plant science, The Plant Cell (published by the American Society of Plant Biologists) has initiated a new feature called Teaching Tools in Plant Biology (TTPB). TTPB is an innovative approach to disseminating timely and accurate information, consisting of a monthly set of PowerPoint slides and lecture notes covering various topics in plant biology. The first TTPB, called "Why Study Plants?" describes the global challenges being addressed by plant scientists. Subsequent lectures are written for an audience of upper level undergraduates, but are adaptable for a more general audience. Topics covered to date



include leaf development, epigenetics, small RNA and an introduction to phytohormones. Upcoming topics will include an in-depth examination of each of the major plant hormones, statistics for biological analysis, light signalling, and Agrobacterium as a pathogen and tool. The first six TTPB are Open Access; TTPB published beginning in April 2010 are available with a subscription to Plant Cell.

Each lecture starts by introducing and setting the context of the topic and then delves more

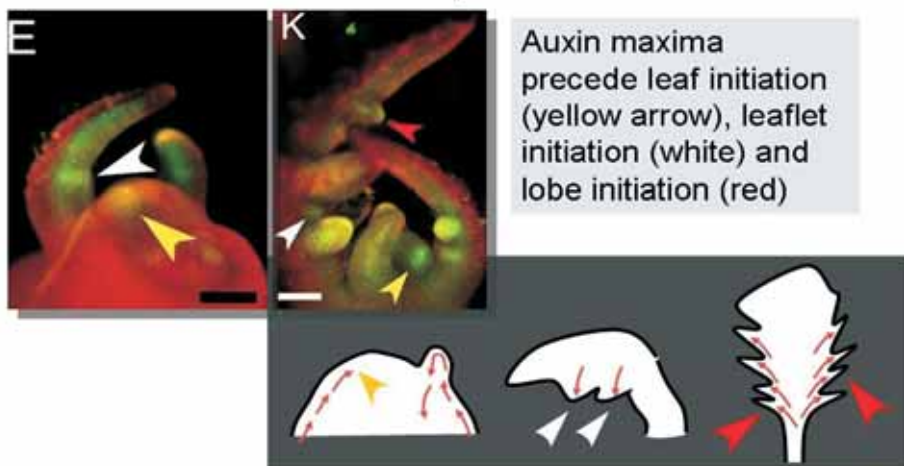
deeply into the molecular actors and scripts. The lectures also explore illustrative or key experiments in more detail, offering the opportunity to discuss the interpretation of real data with students. Each slide set is accompanied by a set of lecture notes written at a level appropriate for undergraduate students. All materials are peer reviewed and up-to-date, and will be revised regularly to remain current.

We anticipate that these materials will be used in various ways. All of the slides are editable so users can modify the materials to suit their needs. TTPBs can be used as starting point for a new lecture on a previously untaught topic, or a few slides might be used to augment a pre-existing lecture. The images on the slides are linked to their original source to help in the creation of other teaching materials. We hope that the slides will be of use to non-plant scientists as well. For example, slides describing the roles of miRNA in plant development can supplement a lecture on miRNA functions in animal development.

We welcome submissions of materials. If you have an idea for a TTPB topic you'd like to co-author, please contact [mwilliams@aspb.org](mailto:mwilliams@aspb.org). All lectures and slides are available for downloading at <http://www.plantcell.org/teachingtools/teaching.dtl>.

Mary Williams  
Features Editor (Teaching Tools)  
The Plant Cell

## Auxin has a recurring role in leaf development





# Launch of the Gatsby Plants TREE

A. Levesley, S. Paxton, C.D. Knight

2010 has seen the launch of a new teaching tool for plant science lecturers: The Gatsby Plants TREE (Tool for Research Engaged Education). The TREE aims to make available teaching materials that bring out current research developments in plant science, through direct access to research-informed lecture slides, animations, lectures and films.

Research-informed teaching is much talked about yet few resources exist which provide direct access to such teaching materials for a given discipline.

The TREE has been developed to support lecturers in the task of engaging undergraduates with research and inquiry. It was conceived by a group of internationally recognised plant developmental researchers who use their own research and that of others in their discipline to illustrate ideas, concepts, and theories in their teaching. The group devised an interlinked hierarchical structure which incorporates key aspects of modern plant science to act as a browsable framework for individual lecture slides and lecture content. A plant science TREE structure was thus created with the added advantage of the structure defining the key areas in modern plant science. The initial focus has been on plant development but the TREE will be further developed by the research community to reflect a comprehensive coverage of plant science.

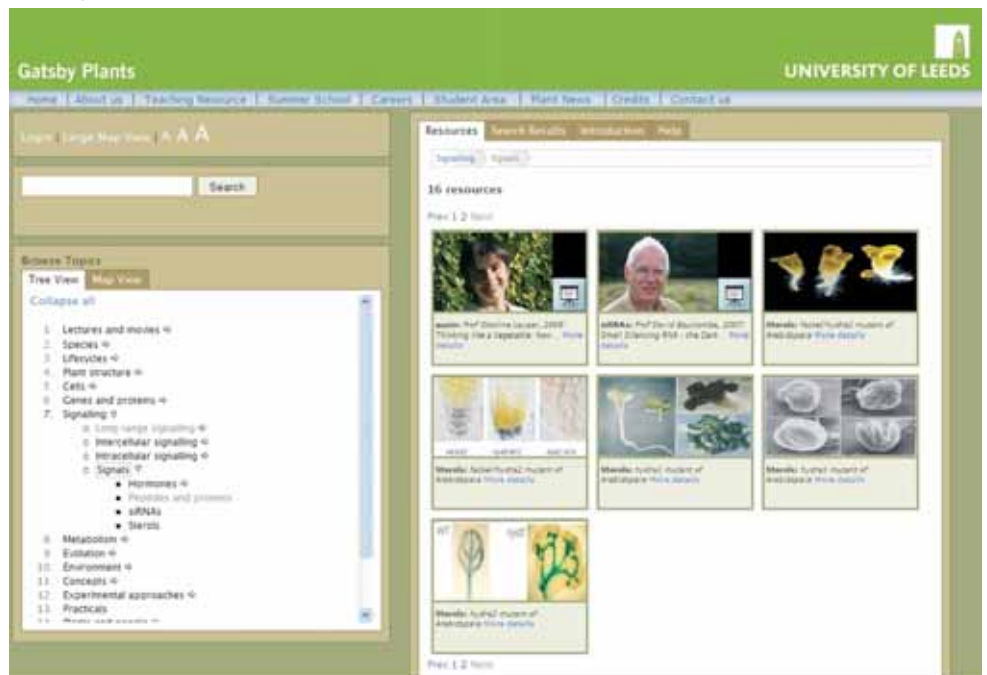
It is our experience that lecturers prefer to search, browse and download individual lecture slide content, from which they build their own lectures. The intuitive TREE structure allows lecturers to do exactly that. The user has the option to browse via 'tree view' or 'map view'; both help the user find relevant content quickly which is important for busy academics. The TREE structure also

helps to place a topic in context and highlight the main plant science topics. Where a lecture slide is derived from a research paper it is linked to the original source for reference and all content which is available for download has been copyright cleared for educational use. Lecturers may also access the popular Gatsby Plants Summer School lectures, which are on-line lectures delivered by leading plant scientists about their research, deliberately pitched at a level to engage and enthuse undergraduate students with the emphasis being on scientific thought and the nature of discovery. Furthermore, high visual impact content such as movie clips, animations and images are available from the TREE. Gatsby Plants also supports the Plant News with RSS feed which links to current developments and breakthroughs in plant science as well as any plant science being reported in the news.

If you would like to be involved in populating the TREE, please contact Aurora Levesley, a.levesley@leeds.ac.uk. To download lecture content and view lectures please visit: <http://www.gatsbyplants.leeds.ac.uk/tree/>

1. TREE plant development group: Prof. Liam Dolan, University of Oxford; Prof. Ottoline Leyser, University of York; Prof. Keith Lindsey, Durham University; Prof. Jane Langdale, University of Oxford; Prof. Enrico Coen, JIC; Prof. Brendan Davies, University of Leeds.

The Gatsby Plants TREE is a new teaching tool which provides access to research-informed lecture slides, animations, lectures and films.



# SEB ANNUAL MAIN MEETING 2010

## 30 June 3rd July

### Clarion Congress Hotel, Prague



SEB members intending to attend the SEB Annual Main Meeting in Prague this year may be interested to see just how beautiful the city looks at night. This picture, which was taken in December 2009, is of the Old Town Square featuring the famous Christmas Markets. In June/July the city will show a different side of its character which, I'm sure, will be as beautiful as its winter face. The Clarion Congress Hotel, the venue for the SEB Meeting, is just a few stops on the underground from the city centre so there will be plenty of opportunity to sight-see during, or following, the week's proceedings.

We are very much looking forward to seeing you in Prague. As well as a packed and varied programme of talks we will provide plenty of networking and social events. In addition, we will hold our regular special events and awards: the Woolhouse and Bidder Lectures; our 2010 president's medallists awards; the young scientists' talks competition sessions; and the long-standing Irene Manton poster awards. Students and junior postdoctoral SEB members will be eligible for travel support and our registration will offer the usual discounts to all SEB members. Go to our website for more details: <http://www.sebiology.org/meetings/Prague/Prague.html>

## PLANT SESSIONS

### Ubiquitin and plant cell signalling

Organised by Ari Sadanandom (University of Glasgow)

#### Speakers Include:

Richard Vierstra (University of Wisconsin-Madison), Mike Hasegawa (Purdue University), Andreas Bachmair (University of Glasgow), Malcolm Bennett (University of Nottingham), Pascal Genschik (CNRS, Strasbourg), Richard Napier (Warwick University), Claus Schwechheimer (Universität Tübingen)

#### Description:

The ubiquitin and ubiquitin-like peptide

mediated posttranslational modification is a central regulator of signaling in eukaryotes. In plants mutations in the ubiquitin pathway block embryogenesis, circadian rhythms, photomorphogenesis, floral homeosis, hormone responses, senescence and pathogen invasion. Nearly a tenth of the Arabidopsis proteome is made of components of the ubiquitin signaling system yet relatively little is known of how this molecular mechanism is co-ordinated by plants during development and responses to environmental cues. Having the capacity to exquisitely regulate ubiquitination provides eukaryotic cells with a means to fine-tune both protein function and levels. Ubiquitylation is brought about through

multi-enzyme processes, with specificity conferred essentially by interactions of substrates with specific ubiquitin protein ligases (E3s) in association with ubiquitin conjugating enzymes (E2s). Regulation of ubiquitylation can occur at multiple levels, including E2-E3 interactions, substrate recognition, chain elongation, binding of ubiquitin to conserved motifs and deubiquitylation. This session starts with the fundamentals of ubiquitination followed by talks on the recent findings that shed new light on how plant cell signaling is modified by ubiquitin and also how ubiquitination itself is regulated. The session will include a large selection of short talks chosen from abstracts submitted for this session.

### Plant Temperature Response Networks

Organised by Kerry Franklin (University of Leicester) & Heather Knight (University of Durham)

#### Speakers Include:

Mike Thomashow (Michigan State University), Martijn van Zanten (Max Planck Institute for Plant Breeding Research), Steven Penfield (University of York), Philip Wigge (John Innes Centre), Harriet McWatters (Dept of Plant Sciences, University of Oxford)

#### Description:

Temperature has a significant impact on plants and determines the geographical limits to growth as well as the growth season. As our understanding of the processes involved in tolerance of temperature extremes increases, so does evidence that temperature signalling pathways interact with other networks to modulate growth. Temperature affects resource allocation and development, from germination through to flowering, as well as responsiveness to other environmental stresses. Furthermore, an understanding of how plants respond to

changes in ambient temperature is of increasing importance with regard to global climate change. The aim of our session is to bring together those actively involved in research into responses to heat and cold stress with those whose interests relate to how temperature modulates plant developmental processes. The session will cover plant temperature perception, temperature stress tolerance and cross-talk between temperature and other signals that lead to changes in growth and development.

## Redox regulation and associated signalling in photosynthesis and respiration

Organised by John Allen (Queen Mary University, London) & Christine Foyer (University of Leeds)

### Speakers Include

James Whelan (University of Western Australia), Jean Greenberg (University of Chicago), Graham Noctor (Institut de Biotechnologie des Plantes, Université de Paris sud XI), John F. Allen (Queen Mary, University of London), Stanisław Karpiński (Warsaw University of Life Sciences), Anna M. Rychter (University of Warsaw), Thomas Pfanschmidt (University of Jena).

### Description:

Chloroplasts and mitochondria are energy-converting organelles in the cytoplasm of eukaryotic cells. Chloroplasts in plant cells perform photosynthesis; the capture and conversion of the energy of sunlight. Mitochondria in both plant and animal cells perform respiration; the release of this stored energy when work is done. Chloroplasts and mitochondria also contain small, specialised genetic systems to make some of their own proteins. Both the genetic and the energy-converting systems of chloroplasts and



mitochondria are descended, with little modification, from those of the free-living bacteria that these organelles once were. Most genes for proteins of chloroplasts and mitochondria are, however, now located on chromosomes in the nuclei of eukaryotic cells. There they code for precursor proteins that are made in the cytosol for subsequent import into organelles. Chloroplasts and mitochondria also play important roles in cellular redox metabolism and signalling connected to photosynthesis and respiration. They are important sources of reactive oxygen species. Hydrogen peroxide is produced by

electron transport processes in the chloroplasts and mitochondria, and by photorespiratory glycolate metabolism in the peroxisomes. This session will focus on the impact of redox metabolism associated with photosynthesis and respiration on plant biology, from metabolic integration, signalling and the control of gene expression to genome evolution. Recent advances in these areas and key conclusions will be discussed, particularly in relation to plant growth, development, and stress tolerance through effects on metabolism and signalling networks.

## Carbon Assimilation under Drought

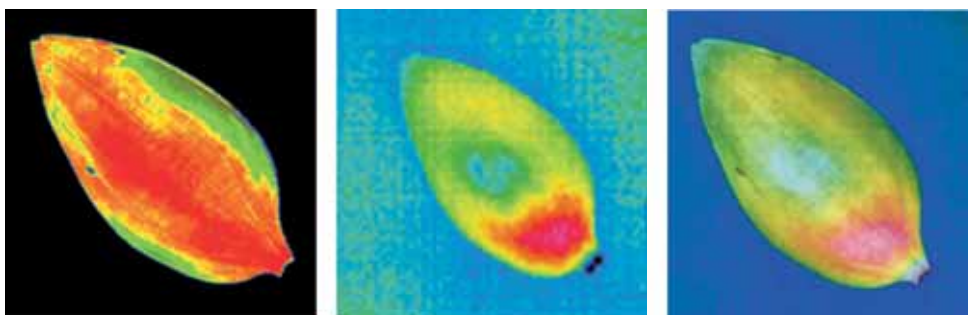
Organised by Martin Parry (Rothamsted Research & Christine Raines (University of Essex)

### Speakers Include:

Susanne von Caemmerer (Canberra), Bertrand Muller (Montpellier), James Hartwell (Liverpool), Robert Furbank (Canberra), Xinguang Zhu (Shanghai), Adam Price (Aberdeen), Tracy Lawson (Essex)

### Description:

To meet the increasing demands for food and fuel there is a need to increase the yield potential of crops. Water availability is one of the major factors limiting crop yield. Photosynthetic carbon assimilation can be severely limited in environments with reduced water due to stomatal closure restricting CO<sub>2</sub> uptake. Therefore when considering how to improve crop



*Simultaneous imaging of chlorophyll fluorescence  $F_q/F_m'$  indicating efficiency of light use for photochemistry (top images) and thermography indicating leaf temperature and evaporative cooling (middle image) on *Vicia faba*. Low image is a combined superimposed image of the above two, and has potential use as a proxy of water use efficiency (Dr Tracy Lawson, Essex University).*

performance it will be important to identify limitations to yield potential and to increase tolerance to short and long term water shortage.

This session will present studies being undertaken to explore the relationship

between carbon assimilation and drought with the aim to identify strategies for the production of higher yielding crops. A number of different approaches are being used including -omics and molecular genetics, metabolic responses and mechanistic modelling.

## Young Scientists in Plant Biology

Organised by Christine Raines (University of Essex)

### Description:

This session comprises talks and posters on all those aspects of plant biology that are not catered to in the specific Plant Section sessions. As the name indicates, we

particularly encourage presentations by post-grads and post-docs. Those who are accepted to give presentations may also be eligible to apply for funding via the SEB Student Travel Grant Scheme or the COB travel grants.

The session is an important element of the scientific programme, with high-quality presentations on a wide spectrum of

subjects. The session (formerly entitled Developments in Plant Biology) has been very successful in recent years, and will take place over two full days at Glasgow in 2009. The programme of talks is organised (as far as possible) into subject areas, so delegates can spend a few hours listening to back-to-back presentations within their general area of interest.

## Alternative Splicing and its Impact on Gene Regulation in Plants

Organised by Andrea Barta (Max F Perutz Laboratories), John Brown (SCRI) & Artur Jarmolowski (Adam Mickiewicz University)

### Speakers Include:

Chris Smith (University of Cambridge), Anireddy Reddy (Colorado State University), Brad Barbazuk (University of Florida-Gainesville), Motoaki Seki (RIKEN Plant Science Centre), Gordon Simpson (University of Dundee), Andreas Wachter (University of Tübingen)

### Description:

Alternative splicing (AS) is the most important post-transcriptional process in modulating gene expression during plant development and in response to external stimuli. This session will present the most up-to-date research on alternative splicing in plants and will assess our current state of knowledge of plant AS. The whole area of research will be put into a broader context with a presentation on alternative splicing in animal systems and its importance in human disease.

Bioinformatic approaches and new technologies for studying alternative splicing

in plants and animals will be described. Intriguing examples of regulation of gene expression and developmental control at both genome-wide and gene-specific levels will be presented. The regulation of AS itself is an essential factor in determining developmental pathways and involves interactions between a variety of cis-sequences and trans-acting factors as part of a "splicing code". Plant AS factors and their function will be described. The session will highlight the challenges facing plant scientists in terms of integrating all aspects of transcriptional and post-transcriptional control.

## Plant Responses to Belowground Stresses

Organised by Glyn Bengough (SCRI) & Phil White (SCRI)

### Speakers Include:

Robert B. Jackson (Duke University), Peter Ryan (CSIRO, Canberra), Tim Colmer (Western Australia), Alexander Lux (Bratislava), Eric Visser (Nijmegen), Loïc

Pagès (INRA Avignon), Philip White (SCRI, Dundee), Glyn Bengough (SCRI, Dundee), Peter Ryan (CSIRO)

### Description:

Belowground stresses to plants will increase as the global environment changes, creating major challenges for food security. This session will report the latest studies and understanding of plant responses to physical, chemical and biological constraints to plant growth, drawing on examples from both crop

and non-crop species. Root and whole plant responses to soil structure, flooding and water stress will be considered along side responses to salt and metal toxicities, and mineral deficiency. The extent to which classical genetics and 'omics' technologies can contribute to the development of crops resilient to belowground stresses, and the lessons that can be learnt from ecological studies, will be presented. Strategies for mitigating the effects of future climate change will be discussed.

## DNA Repair and Recombination

Organised by Karel Angelis (Institute of Experimental Botany, Czech Republic) & Andy Cuming (University of Leeds)

### Speakers Include:

Stephen C. West (Cancer Research), Michael Lisby (University of Copenhagen), Holger Puchta (Botanisches Institut II, Universität Karlsruhe (TH)), Chris Franklin (University of Birmingham), Charles White (UMR CNRS 6247 - Clermont Université - INSERM U931), Karel Riha (Gregor Mendel Institute of Molecular Plant Biology)

### Description:

The existence of rapid and efficient mechanisms for the repair of DNA damage is essential for the maintenance of genomic integrity in all organisms. DNA incurs

damage as a consequence exposure to environmental stresses (radiation, genotoxic chemicals) but also in the normal course of DNA replication. DNA damage can be mutagenic, and in the case of the incidence of double-strand breaks, highly cytotoxic through the loss of genetic information. All cells maintain biochemical mechanisms for the surveillance of the genetic material and its rapid and accurate repair in the event of damage. Additionally, these mechanisms also have important functions in maintaining genetic diversity (meiotic recombination) and can be exploited for the integration of transgenes. Understanding the diverse mechanisms by which DNA damage is repaired is a prerequisite for developing therapies for conditions like cancer, for enhancing recombination rates in plant breeding technologies and in developing novel "clean gene transfer" methodologies.

In this session we explore the most recent advances in our understanding of DNA repair and recombination, with the principal focus on processes occurring in plant cells. Our invited speakers are all leading experts in the field of plant DNA repair and recombination, and their contributions are counterpointed by the extensive studies in mammalian and yeast systems, that are highlighted in our two Keynote Lectures. Dr Steve West has characterised the functions of the major recombinases in mammalian cells, and determined the structure of the Holliday junction: the defining feature of homology-dependent DNA repair in somatic and meiotic recombination. Dr. Michael Lisby has shown how DNA damage is undertaken in dedicated "repair shops" in yeast nuclei, through visualisation of the assembly of multi-protein repair complexes, in vivo.

# CELL SESSIONS

## Plant Cell Biology: Cell Biology of Plant Defence

Organised by Patrick Hussey (University of Durham)

### Speakers include:

Gero Steinberg (University of Exeter), Nick Talbot (University of Exeter), Jim Beynon (University of Warwick), Gary Loake (University of Edinburgh), Peter Urwin (University of Leeds), Janice De Almeida-Engler (INRA - Sophia-Antipolis), Patrick

Hussey (University of Durham), Cyril Zipfel (Sainsbury Laboratory)

### Description:

In order to prevent disease, plant cells maintain multiple layers of defence against invasion by infectious organisms. Responses are required for a wide variety of threats that include pathogenic bacteria, fungi, oomycetes and metazoans such as nematodes and insects. This session will focus on recent advances in the understanding of molecular mechanisms that

shield plant cells from attack or are exploited by pathogens to subdue the host. The programme will integrate broad aspects of plant cell biology including: i) The role of autophagy in pathogen and host. ii) Receptors of microbe-associated molecular patterns (MAMPs). iii) Co-evolution of pathogen effectors and plant R-genes. iv) Changes to plant physiology and morphology induced by nematodes. Protein trafficking, programmed cell death and the cytoskeleton are core themes throughout the programme.

## Polar adaptations and challenges

Organised by Simon Morely (British Antarctic Survey), Hans-Otto Pörtner (Alfred Wegener Institute) & Lloyd Peck (British Antarctic Survey)

### Speakers Include:

Christina Cheng (University of Illinois), Pete

Convey (British Antarctic Survey), Bill Davison (University of Canterbury, NZ)

### Description:

A cause and effect understanding of thermal limitation and adaptation at various levels of biological organisation is crucial in the elaboration of how the polar climate has shaped the functional properties of extant

Antarctic and Arctic organisms. In the marine realm, the functional specialization to permanently low temperatures of e.g. Antarctic oceans implies reduced tolerance of high temperatures, as a trade-off. Maintenance of membrane fluidity, enzyme kinetic properties and protein structural flexibility in the cold support metabolic flux and regulation as well as cellular functioning overall. Gene expression patterns and, even more so, loss of genetic information reflect the specialization of Antarctic organisms to a narrow range of low temperatures. Limited oxygen supply to tissues upon warming is an early cause of functional limitation. The evolutionary forces causing low metabolic rates as a uniform character of life in Antarctic ectothermal animals may be linked to the requirement for high energetic efficiency in organismic functioning in the cold. These special features become clear when contrasted with the larger temperature variability in other cold oceans. They may be linked to life history consequences and lifestyles typically seen in the permanent cold. The present symposium is intended to bring together specialists in the field of Antarctic and Arctic (as well as sub-Arctic/Antarctic) experimental biology, who are addressing the specialization of polar life forms at various functional levels, membrane to whole organism and ecosystem. Preference will be given to studies that compare across environments.



Photograph by Jon Withers, BAS

## The plant cell cycle and its interaction with plant hormones

Organised by John Bryant (University of Essex), Dennis Francis (Cardiff University) & Helena Lipavska (Charles University Prague)

### Speakers Include:

Jim Murray (Cardiff), Pete Pascuzzi (University of North Carolina), Christian Chevallier (Bordeaux) Marina Dermastia (Ljubljana), Helena Lipavska (Prague) Pascal Genschik (Strasbourg), Denes Dudits (Szged), Janusz Maszewski (Lodz), Bill Thompson (University of North Carolina, Raleigh), Alicja Ziemienowicz (University of Lethbridge, Alberta), John Doonan (John Innes Centre, Norwich), Malcolm Bennett

(University of Nottingham), Dorte Muller (University of York), David Evans (Oxford Brookes University), Dennis Francis (University of Cardiff), John Bryant (University of Exeter), Hong Wang (University of Saskatoon), Tom Rost (University of California, Davis) and Beatrice Bitonti (University of Calabria).

### Description:

We have recently seen significant advances in our understanding of the plant cell cycle. Many of the controls that operate within individual cycles have been elucidated although others remain unknown. In cell and organ culture systems it is clear that plant hormones are necessary to maintain the ability of cells to cycle. We can make similar

inferences from the effect of Agrobacterium-mediated transformation on cell behaviour. In the growing plant, cell division occurs in specific regions, meristems, which are initiated and maintained by the activity of meristem identity genes; we are beginning to understand the interaction of these genes with those whose products directly mediate the cell cycle. Hormones are also involved here as key players in the signalling networks that regulate differentiation and morphogenesis."

Thus, in these sessions we will move from consideration of the events of the cell cycle right through to looking at cell division in the whole plant, and at each level will bring in the roles of hormones.

## Chromosome Organization and Cytogenomics

Organised by Jaroslav Dolezel (Institute of Experimental Botany, Czech Republic) & Trude Schwarzacher (University of Leicester)

### Speakers Include:

Thomas Cremer (Ludwig Maximilian University, Munich), Jenny Marshall Graves (The Australian National University), Paul Fransz (University of Amsterdam), Andreas Houben (Leibniz Institute of Plant Genetics), Jiri Macas (Biology Centre ASCR), Boris Vyskot (Czech Academy of Sciences), Andrew Leitch, (Queen M, University of

London), Mirislav Plohl (Ruder Boskovic Institute), Raquel Chaves (Institute for Biotechnology and Bioengineering)

### Description:

We will bring together established and new researchers in the area of chromosome organization and cytogenomics who will discuss the exciting biology which exploits the availability of DNA sequence data and new microscope, cytometry and labelling technologies. Chromosomes, consisting of the DNA packaged into chromatin with the histone proteins, are the critical unit within the nucleus, defining the structural organization which relates to DNA

condensation, expression, replication and segregation. They play a key role in maintaining the stability of the genome, in recombination and inheritance, and in genetic diseases, and chromosomal changes are a feature of evolution in many groups of plants and animals. The session will be divided to cover:

- 1) Chromosome evolution and specialized chromosomes
- 2) Heterochromatin and epigenetic chromosome organization at metaphase and interphase
- 3) Structure and evolution of repetitive DNA sequences (including telomeres and centromeres)

## Molecular Biology of Thermal adaptation

Organised by Melody Clark (British Antarctic Survey) & Magnus Lucassen (Alfred Wegener Institute)

### Speakers Include:

Gretchen Hoffman (University of California),  
Volker Loeschcke (Aarhus University)

### Description:

The study of thermal biology and how animals adapt to different temperature regimes has long been a subject of study by physiologists and ecologists. To date, ecologists have concentrated on biogeography and range limitations and physiologists have identified thermal limits and underlying mechanisms. There is now added impetus to this research with the requirement to understand how climate change will affect biodiversity, both in terms of current monitoring and predictions for the future. A detailed understanding of the nature of thermal adaptation is crucial in this respect. Genomic technologies have become increasingly sophisticated in recent years, and dramatically cheaper, such that it is now possible to apply these techniques to environmentally relevant- non-model species. These techniques enable us to examine in finer detail, the cellular changes

associated with changing thermal regimes and have transformed our approach to ecophysiological studies. In this session we aim to concentrate on molecular studies, conducted within multidisciplinary research projects, which provide us with a greater

understanding of thermal adaptation mechanisms in non-model species. We welcome talks from all areas of research: terrestrial, through fresh water to marine, microbes to iconic megafauna.



## Small GTPases, their regulators and effectors

Organised by Ian Moore (University of Oxford) & Viktor Čárský (Charles University Prague)

### Speakers Include:

Suzanne Pfeffer (Stanford University, USA),  
Wei Guo (University of Pennsylvania, USA),  
Marino Zerial (MPI Dresden)

### Description:

In this session on the small GTPases, their regulators and effectors we will take an evolutionary perspective in an attempt to review recent progress of functional analysis of small GTPases functions in cell morphogenesis. We will compare advanced knowledge in animals and fungi with the analysis in plants and other "Bicont" organisms. It is obvious that small GTPases are intimately involved in the evolution of eukaryotic cell, esp. endomembrane system. One proximal goal of the meeting will be the

discussion on the GTPases, regulators and effectors equipment of LECA and their later diversification in eukaryotic phyla. In the focus of the meeting will be Rab, Rho and Arf GTPases, proteins involved in their post-translational modification and functional cycle as well as their effectors both in the secretory pathway, cytoskeletal dynamics and signalling.

## Plant and Animal Circadian Clocks

Organised by Hugh Piggins (University of Manchester) & Alex Webb (University of Cambridge)

### Speakers Include:

Nick Glossop (Manchester) and Alena

Sumova (Prague)

### Description:

In recent years, the exploration of circadian clocks has moved from identifying potential circadian clock genes to the characterisation of regulatory network structures and

properties and interactions with other physiological, metabolic and developmental networks. This session will focus on circadian biology in plants and animals. The latest systems, computational and experimental tools will be showcased.

## Immunity across the kingdoms

Organised by Adam Benham (University of Durham)

### Speakers Include:

Thomas Boehm (Max-Planck Institute),  
Jonathan Jones (Sainsbury lab), Jim Kaufman (Cambridge), Pete Kaiser (Compton Inst Animal Health)

### Description:

How does an organism protect itself from infection? This question is important not just for humans who want to fight off the latest influenza virus, but also for all other animals and plants. Recent years have seen a boom in our understanding of the similarities, and differences, in how immune defense works across the kingdoms. This session aims to bring together scientists with an interest in all aspects of immunity and host defence, to

discuss the latest developments in the field. Topics covered by the invited speakers include novel discoveries in plant immunity, the evolution of the major histocompatibility complex, the development of the thymus, and avian immunity to pathogens. Abstracts are particularly encouraged from scientists working on comparative immunology, and those with a general interest in multi-disciplinary approaches to studying immune systems.

# ANIMAL SESSIONS

## Horizon scanning in Ecotoxicology - what are the future environmental concerns of natural and man-made pollutants

Organised by Nic Bury (King's College London) & Armin Sturm (University of Stirling)

### Speakers Include:

Kevin Chipman (University of Birmingham),

UK), Tvrtko Smital (Ruder Bosković Institute, Zagreb, Croatia), Chris Wood (University of McMaster, Canada), Richard Handy (University of Plymouth, UK), Rolf Altenburger (Helmholtz Centre for Environmental Research).

### Description:

Throughout the world there have been calls to assess the linkage between ecosystem health and human health. Important aspects of this are quality standards for water and air that warrant sustainable protection of

ecosystem function. Our aim throughout this session is to look at potential future risks posed by pollution to organisms' health, survival and ultimately biodiversity. The Society traditionally has a strong base in comparative physiology, biochemistry and endocrinology as well as animal behaviour. But, the session is not restricted to these disciplines and we would encourage presentations that embrace future technologies, predictive in vitro or in vivo models, novel techniques or views on new environmental regulations.

## Swim, flap, waddle, sleep: optimising life across time and distance

(a tribute to Pat Butler on his retirement) Organised by Peter Frappell (University of Tasmania) & Kath Sloman (University of Plymouth)

### Speakers Include:

Bill Milsom (University of British Columbia), Richard Stephenson (University of Toronto),

Brian McMahon (University of Calgary), Ted Taylor (Birmingham University), Julian Metcalfe (Centre for Environment, Fisheries, and Aquaculture Science), Nigel West (University of Saskatchewan)

### Description:

Optimising life is the key to survival of the individual, hence the species. Many animals face changing climatic conditions, whether they are diel, seasonal or annual, which has resulted in the evolution of a variety of physiological and behavioural means to cope or escape their surrounds.

Optimisation in performance is achieved through improved efficiencies in physiological mechanisms and behaviours. The diversity of approaches adopted by animals ranges from torpor through to long distance migration. Each approach, while unique, is invariably a modification of a mechanistic and/or behavioural blue-print that has been shaped by evolution. The behavioural and physiological mechanisms, the underpinning evolutionary blue-prints and the approaches adopted by animals to cope with change across time and distance is what this symposium is about.

## Ontogeny and Phylogeny of the Heart

Organised by David Sedmera (Academy of Sciences, Czech Republic) & Tobias Wang (Aarhus University)

### Speakers Include:

Bohuslav Ostadal (Academy of Sciences of the Czech Republic), Anton FM Moorman (University of Amsterdam), Tony Farrel

(University of British Columbia), James Hicks (UC Irvine), Brian McMahon (University of Calgary), David Sedmera (Charles University, Prague), Bruno Tota (University of Calabria), Jose M Icardo, (Departamento de Anatomía y Biología Celular)

### Description:

This session Ontogeny and Phylogeny of the Heart will cover all aspects of heart development from evolutionary as well as ontogenetic perspective. Apart from focusing

on widely studied animal models, topics will include also invertebrates and lower vertebrates in which many different heart forms matched to specific functional demands are found. In particular, development of cardiac pacemaking and conduction system will be covered in detail. One keynote talk will cover developmental changes in tolerance to oxygen deprivation. Target audience are developmental and evolutionary biologists with interest in cardiovascular system.

## Respiratory control: strategies and mechanisms in periodic and non-periodic ventilation

Organised by Stefan Hetz (Humboldt University Berlin) & John Terblanche (Stellenbosch University)

### Speakers Include:

Tim Bradley (UC Irvine), Bill Milsom (University of British Columbia)

### Description:

We will focus on continuous vs. discontinuous or episodic respiratory patterns in animal kingdom like discontinuous gas exchange in insects, episodic breathing in vertebrates, changes of breathing patterns during hibernation. Is there a common pattern or mechanism behind?

## Evolutionary and ecological physiology

Organised by Pawel Koteja (Jagiellonian University), David McKenzie (University of Montpellier) & Michael Berenbrink (University of Liverpool)

### Speakers Include:

Theodore Garland, Jr. (University of California, Riverside), William H. Karasov (University of Wisconsin-Madison, Madison, WI, USA)

### Description:

How animals cope with spatial and temporal variation of environmental conditions has been always a major question in ecological evolutionary physiology. However, the issue has now become of a special relevance with the growing awareness of the astonishing rate and scale of contemporary environmental changes. Physiological modifications in response to these changes can occur on two distinct levels: phenotypic plasticity and genetically based, heritable adaptations. Experimental studies on

phenotypic plasticity and comparative studies exploring interspecific adaptive variation have a long tradition, and recently molecular analyses and experimental evolution have been also recognized as promising tools in animal ecological physiology. The purpose of this session is to bring together and discuss both the opportunities and limitations of these approaches to eco-physiological problems, especially, but not limited to, those concerning animal energetics.

## General Thermal Biology

Organised by Hans-Otto Pörtner (Alfred Wegener Institute)

### Description:

As the name indicates, this session comprises talks and posters on all aspects of Thermal

Biology from Animal, Plant and Cell Sections. Hot topics include the role of temperature in climate change effects on ecosystems and its interaction with other stressors. As such, the session is an important element of the scientific programme, with high-quality presentations on a wide spectrum of subjects. The General session

has been successful in recent years, by grouping the submitted contributions into overarching themes. Session length at Prague in 2010 will depend upon the number of submissions. We particularly encourage presentations by post-grads and post-docs.

## The Scaling of Metabolic Rate with Body Size in Organisms: its causes and ecological relevance

Organised by Shaun Killen (University of Montpellier) & David McKenzie (University of Montpellier)

### Speakers Include:

Douglas S. Glazier (Juniata College), Brian K. McNab (University of Florida), Craig R. White (University of Queensland)

### Description:

The scaling of metabolic rate with body size has been a central research theme in biology for over a century. Recently there has been a particular interest in how patterns of

metabolic scaling at the individual level may affect ecological phenomena and, in turn, how environmental factors may influence changes in metabolic rate with body size. The purpose of this symposium is to review recent evidence of these relationships, and to exchange ideas regarding the underlying factors that cause the observed patterns of metabolic scaling both between and within taxa.

## The challenge of measuring energy expenditure: current field and laboratory methods

Organised by Lewis Halsey (Roehampton University)

### Speakers Include:

Claus Bech (Norwegian University of Science and Technology), Jonathan Green (University of Liverpool), David Grémillet (CEFE-CNRS), Dominic McCafferty (University of Glasgow), Emily Shepard (Swansea University), Ken Welch (University of Toronto)

### Description:

A number of methods are presently available for measuring/estimating energy expenditure in animals, some of which are more widely known and used than others. All these methods have provided insight into animal

energetics either in the laboratory and/or in the field, but all come with pitfalls and require expertise to be used effectively and accurately. This symposium looks at advances in our knowledge of animal

metabolism through the employment of techniques to estimate energy expenditure, the development of those techniques, their strengths and limitations, and the issues surrounding their valid application.

## Conservation Physiology

Organised by Craig Franklin (University of Queensland) & Stephen Cooke (Carleton University)

### Speakers Include:

Professor Michael Romero (Tufts University, USA), Dr Michael Kearney (University of Melbourne, Australia), Professor Tony Farrell (University of British Columbia, Canada), Professor Steven Cooke (Carleton University Canada), Professor Rod Wilson (University of Exeter, UK)

### Description:

Increasingly, physiologists and experimental biologists are contributing to the field of Conservation Biology. Termed "Conservation Physiology" this emerging field explores the responses of organisms to anthropogenic threats and attempts to assess and predict the effects of current and future environmental change. Data gathered using this approach can provide critical information on the impact of threats to animals which in turn can be used by conservation practitioners and policy makers in setting priority areas for conservation action. Conservation physiology takes a multidisciplinary and

integrative approach that encompasses both field and laboratory-based research and merges the fields of physiology and ecology. The aim of this session is to bring together physiologists, ecologists and conservation biologists that have an interest in studies that are assessing and predicting the impacts of current and future human-induced environmental change on organisms. Whether you are assessing local habitat change/modification or investigating the possible effects of global climate change on animals we are offering a welcoming and engaging session and encourage student participation. See you in Prague 2010.

## General Biomechanics

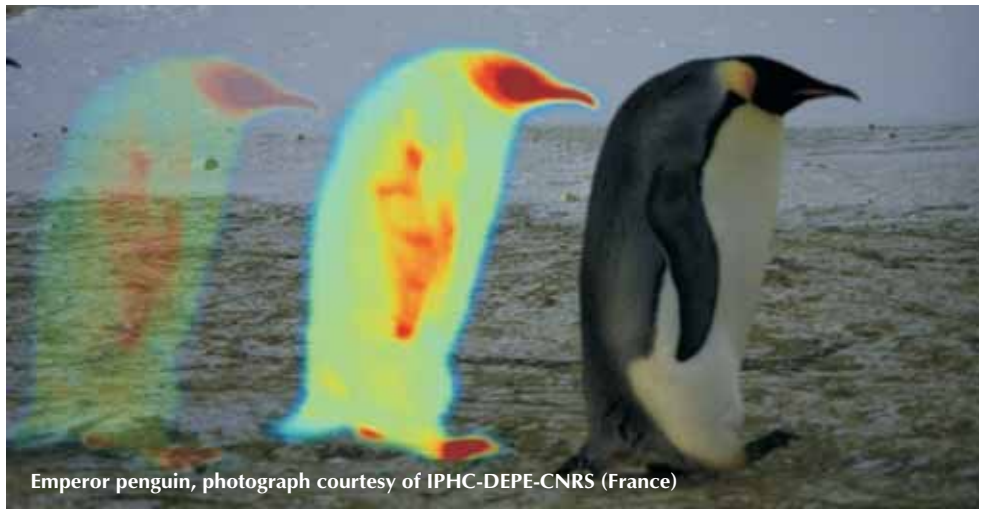
Organised by Peter Aerts (University of Antwerp)

### Description:

The 'general biomechanics session' brings (young) scientists together dealing in their

research with the mechanics of the most diverse topics in biology. From insect flight to suspension feeding, from horse locomotion to the mechanics of water transport in plants, from material properties to kinematics of bird flocks, from muscle mechanics to..., all topics find their place in the session which is traditionally attended by

a large and broadly interested audience. Moreover, five years ago, we started a new initiative: General Biomechanics Best Poster and Best Presentation prizes (3 for each category). Yet another reason to join us in Prague next summer.



Emperor penguin, photograph courtesy of IPHC-DEPE-CNRS (France)

## General Animal Biology

Organised by Kath Sloman & Jonathan Stecyk (University of Alberta)

### Description:

As the name indicates, this session comprises talks and posters on all those aspects of animal biology that are not catered to in the specific Animal Section sessions. As such, the session is an important element of the scientific programme, with high-quality presentations on a wide spectrum of subjects. The General session has been very successful in recent years, and will take

place over two full days at Prague in 2010. The programme of talks is organised (as far as possible) into the subject areas of the special interest groups of the Animal Section, so delegates can spend a few hours listening to back-to-back presentations within their general area of interest. We particularly encourage presentations by post-grads and post-docs, with the award of General Animal Best Poster or Best Presentation prize (3 of each category) to these early career scientists.

*Broad-barred goby (Gobiodon histrio).*  
Courtesy: Göran Nilsson



## Function and Control of Elastic Systems

### Speakers Include:

Rodger Woledge (Imperial College London), Hugh Herr (Massachusetts Institute of Technology), Andrew Biewener (Harvard University) and Sheila Patek (University of Massachusetts)

### Description:

The elastic properties of many biological tissues play an important role in movement, from powering rapid ballistic actions to modulating muscle dynamics to recycling energy in cyclic locomotion. Recent work on elastic mechanisms suggest that they are more widespread, occur in more tissues, and perform a broader range of mechanical tasks than previously thought. This session will explore our current understanding of the role

of elastic mechanisms in movement, muscle function, and robotics. Of particular interest is the control of elastic systems, which poses a challenge because the force-length behavior of elastic tissues is intrinsic to their material properties and their modulation often involves cams, catches and other elegant anatomical mechanisms. We encourage submitted talks and posters to stimulate discussion and cross disciplines.

# EDUCATION SESSIONS

Organised by the Education & Public Affairs Section

## Academia - Mastering a complex career

### Speakers:

Jeremy Pritchard (University of Birmingham), Teresa Valencak (Veterinary University of Vienna), John Bothwell (Queen's University Belfast), Otakar Fojt (Science & Innovation, British Embassy, Prague), Irene Hames (Managing Editor, The Plant Journal), Eurodoc (speaker TBC).

### Description:

Research shows that only 1 in 6 postdoctorals (and 1 in 20 postgraduates) will eventually secure an academic post so how can you enhance your prospects? Indeed, even if you do secure a post, how will you sustain your research success and impact? Working 24/7 in the lab doesn't necessarily lead to success; other factors such as building a network of contacts and supporters, gaining confidence in

communication and acting on funding, publishing and collaboration opportunities are crucial to becoming a more independent researcher and ultimately securing (and keeping) an academic post. Posters are invited for this session which demonstrate training programmes, activities and/or innovative practices associated with enhancing the academic experience and 'knowledge impact' which will be of interest to the Bioscience community.

## Pre-networking event

### Description:

This informal session, which will run on 29th June, is aimed primarily at doctoral research students and postdoctoral researchers but is open to any delegate wishing to attend. If you are interested in meeting new people to improve your conference experience, if you

want to find possible future collaborators, mentors or friends this event is designed to facilitate this process. Last year we received excellent feedback from those who attended:

*"Thank you for organising this event! It was great, and my time at the conference was a lot better because of it. It was really good to have the chance to meet a lot of new people! I liked that no one at the event really knew*

*anyone either, so it was a lot less intimidating than having to walk up to random people at the conference."*  
*"I met many people that I would not have in the normal run of the conference, they were from vastly different areas and in all likelihood we would not have crossed paths. However I had many interesting discussions with these people and will be keeping in touch with many of them."*

## Women in Science Dinner

### Speaker:

Professor Jana Albrechtova (Charles University, Prague)

### Description:

We welcome delegates (male and female) to

attend our Women in Science dinner in the Clarion Hotel's beautiful bistro restaurant to experience good food and an excellent opportunity to listen and discuss the topical subject of 'networking'. As the head of a university department and vice president of an international learned society, our speaker this year, Professor Jana Albrechtova, will give a personal perspective on the value and

importance of building up an active network to enhance your visibility and improve your research profile. The talk will take place between the second and third courses after which there will be plenty of time for questions and discussion.

# Special Awards & Lectures

## The Bidder Lecture 2010

Wednesday 30th June 2010  
17.30 - 18.30

The Bidder Lecturer for 2010 is Ben Scheres from Utrecht University.

Ben is interested in developmental mechanisms in plants, and in the extent to which these differ between the plant and animal kingdoms. His group investigates pattern formation, cell polarity and cell cycle control. Their aim is to understand at the single cell level the network logic of interacting gene products that determine cell specification, cell division rates and - planes, and organ growth. To this end the group analyzes interactions between

many genes that are involved in patterning, cell polarity and cell cycle control in the Arabidopsis root tip. Ben's talk is entitled 'Multilevel Signaling in Plant Development' and a small summary of the talk is below: Plants have flexible cell patterning mechanisms to compensate for the lack of cell migration in their growing tips, the meristems. In the root meristem, a set of AP2-domain transcription factors encoded by the PLETHORA genes define the activity of stem cells and their daughters in a process that intimately involves the global signal auxin. A second and simultaneously acting stem cell patterning system involves interactions between GRAS domain transcription factors and the RETINOBLASTOMA pathway. We apply genetics and genomics experiments to untangle the multiple feedback loops that act in both patterning systems and involve not only molecular circuits but also higher-level influences such as shape change. We investigate primary and lateral root formation and we use experimental cycles intertwined with

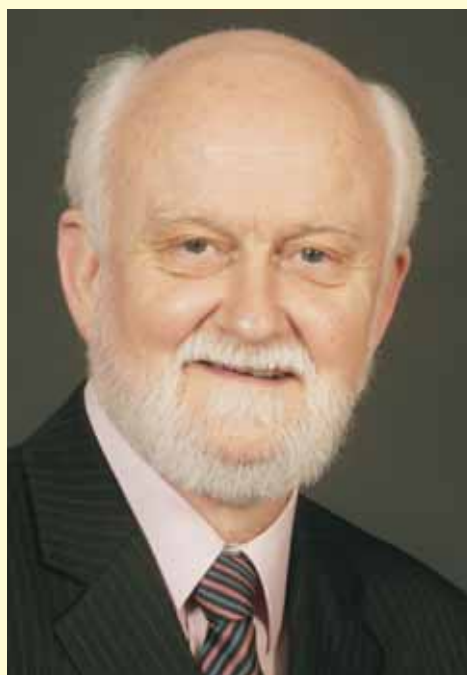


computational modeling to understand our results. The 'looped' pathways that are being uncovered are also acting during shoot development in the process of phyllotaxis. I will discuss similarities and differences between patterning systems in roots and shoots and, more generally, in plants and animals.

## The Woolhouse Lecture 2010

Thursday 1st July 2010  
9.30 - 10.30

The 2010 Woolhouse Lecture will be given by Don Grierson. He received his BSc in Biological Sciences from the University of East Anglia and, after a short period in industry, studied for his PhD in Plant Sciences at Edinburgh. Don is a research professor in the School of Biosciences at the University of Nottingham's Sutton Bonington Campus, where he has been a staff member for 39 years. He was previously head of



Biosciences and pro-vice-chancellor for research at Nottingham from 2003-2007. The Grierson group were the first to clone and identify a range of fruit ripening genes encoding polygalacturonase, pectinesterase, phytoene synthase, and ACC oxidase (the enzyme that converts ACC to the plant hormone ethylene) and were among the first to generate transgenic plants in which traits were altered by silencing specific genes. Recently he has been analyzing aspects of the ethylene perception and signaling chain. Don is interested in, and has experience of, successful collaboration with industry and over a dozen patents were granted for applications of this work, which was funded by BBSRC, EU, and other agencies. He has calculated that so far he has spent four years of his life writing grant applications. Don interacted with Harold Woolhouse as an examiner and fellow committee member. He joined the SEB while he was a PhD student and was elected FRS and made OBE in 2000.

# SEB PRESIDENT'S MEDALLISTS 2010

## Cell Section

**Marcel Janson**  
(Wageningen University)



After my PhD in biophysics, I spent three years working as a postdoc in the laboratory of Phong Tran at the University of Pennsylvania. Here I picked up work on microtubule organization in fission yeast, which is a great model system to investigate some of the more physical aspects of cell biology. At Upenn and later at the free university in Amsterdam, I studied how polar microtubules become oriented within networks using genetic tools and advanced fluorescence light microscopy. For the work I received the Howard Holtzer prize of the department of cell and developmental biology at Upenn.

Meanwhile, at the European Molecular Biology Laboratory (EMBL) in Germany, François Nédélec and his team worked on the problem using computer simulations. Together we analyzed the one-to-one interactions between microtubules in detail. Using a systems biological approach, we verified that a simple two-component system of molecular motors and passive microtubule bundling proteins could setup controlled bipolarity in linear microtubule bundles (the work was published in *Cell* and reviewed in,

amongst others, molecular systems biology; Carazo-Salas and Nurse 2007). We clearly demonstrated that microtubule bundling proteins play a profound and hitherto underappreciated role in the sorting of microtubule networks and underlined the necessity for more detailed knowledge on the molecular mechanisms by which these proteins operate. In collaboration with the group at the free university, I subsequently investigated the microtubule bundler *ase1* using single molecule fluorescence techniques developed in the group. This revealed a physical mechanism in which oligomer formation of bundling proteins is catalyzed by the microtubule lattice. In our model, protein localization to overlapping microtubules is controlled by the geometry of microtubule binding sites, suggesting novel ways in which bundling can be regulated biochemically during the cell cycle (Kapitein et al. *Current Biology* 2008).

At Wageningen University I now further continue the work on microtubule organization and the coordination between motors and bundling proteins.

## Plant Section

**Kerry Franklin**  
(University of Bristol)



Kerry graduated in Biology from the University of Bristol in 1997. This was followed by an MRes. in Advanced Plant Science at the University of Wales, Aberystwyth. She then moved to Horticulture Research International (Wellesbourne) and

later, the University of Southampton, during a BBSRC-CASE- funded PhD studentship supervised by Brian Thomas, Steve Jackson and Matthew Terry. Here, she investigated light-regulation of the tetrapyrrole biosynthetic pathway in tobacco and obtained her PhD in 2001.

Pursuing an interest in plant photobiology, Kerry moved to the University of Leicester in 2002 where she worked for 4 years under the mentorship of Garry Whitelam. This was interspersed by a short stint in the lab of Peter Quail (Plant Gene Expression Center, CA, USA), funded by a fellowship from the Human Frontier Science Program. Her early postdoctoral research involved investigating the regulatory functions of the Arabidopsis phytochrome family of plant photoreceptors, a project which provided the first characterisation of a mutant deficient in phytochrome C. Later postdoctoral work involved analyses of 'the shade avoidance syndrome', a suite of plant developmental responses initiated following perception of the threat of vegetational shade. Here, she demonstrated that shade avoidance responses are gated by the circadian clock and dramatically modified by ambient growth temperature.

In 2006, Kerry was awarded a Royal Society

Research Fellowship and Lectureship at the University of Leicester. She has since continued her research on light and temperature signal integration and shown that the 'CBF regulon' of cold acclimation genes are regulated by light quality in a circadian-gated and ambient temperature-dependent manner. More recently, Kerry's lab have identified epigenetic modifications involved in shade avoidance signalling and shown that the transcription factor PHYTOCHROME INTERACTING FACTOR 4 (PIF4) acts as a master regulator of high temperature-mediated elongation growth. Current work focuses on understanding the signalling processes controlling plant architectural adaptations to light and temperature stimuli and investigating the adaptive significance of different developmental strategies. Kerry has recently returned to the School of Biological Sciences at the University of Bristol where she is currently rebuilding her research group.

Kerry would like to thank all former supervisors, colleagues, lab members and research funding bodies for their input and support. In particular, she would like to acknowledge Garry Whitelam who provided many years of inspirational mentorship, (mostly) constructive criticism and invaluable career advice.

## Education & Public Affairs

### John Bothwell (Queen's University, Belfast)



John graduated from Oxford in 1995 (BA Biochemistry) and stayed on in Oxford to do his postgraduate research, using NMR spectroscopy to study mammalian brain metabolism in Prof. Sir George Radda's group. John juggled research with rugby for five years, playing in the annual Oxford/Cambridge Varsity Match in 1996, coaching the Oxford Women's team to the UK Championship in 1999 and being

awarded his DPhil in 2000 for a thesis which looked at how membrane transport processes contribute to brain volume regulation during hypo-osmotic shock.

After his DPhil, John married, moved from animals to plants and joined Dr. Julia Davies's group at the Department of Plant Sciences in Cambridge, where he attended his first SEB-sponsored meetings - Prof. Philip White's Calcium meetings at HRI Wellesbourne. Working on Arabidopsis, John studied the way in which membrane transporters direct polarised root hair growth and, in 2001, moved this work to Professor Colin Brownlee's lab at the Marine Biological Association in Plymouth. At the same time, John began playing rugby for Plymouth Albion RFC, appearing in the County Championship and taking a year away from research in 2003 to concentrate on playing rugby while all his joints still worked. He played prop, which explains the current shape of his nose.

Returning to a second postdoctoral position at the MBA in 2004, John continued his work on cell polarity determination, but switched model systems from flowering plants to the brown seaweed *Fucus serratus*, and has worked on algal development and evolution ever since. John's first son was born in 2005, so he took a year away from science when his postdoctoral position ended. During that year off, John began looking for advice for out-of-

work postdocs and, not finding a great deal and with encouragement from the SEB's Sarah Blackford, used the SEB 2006 Canterbury meeting to gauge interest in a national postdoctoral network. Building on this, John obtained funding from RCUK to bring together postdocs from around the UK to discuss postdoctoral career progression at a meeting in UCL. This rapidly snowballed and John was invited to help write the RCUK Concordat for the Career Development of Researchers; RCUK's current roadmap for academic career development in the UK. As part of this, John wrote articles to journals, spoke at conferences, gave presentations to Governmental advisory boards about the value of the UK postdoctoral community, and now sits on the External Advisory Board of Vitae (ex-UK GRAD).

Scientifically, John was awarded a Leverhulme Early Career Fellowship at the end of 2007 to look at the genetic mechanisms of sex determination in the brown seaweeds. This work was carried out between the MBA in Plymouth and the Station Biologique in Roscoff, complementing John's contribution to the first genome sequencing effort for the brown seaweeds. Following the birth of his second son in 2008, John was appointed to a Lectureship in Marine Biology at Queen's University Belfast, where his group looks at the developmental biology and evolution of the brown seaweeds.

## Animal Section

### Jim Usherwood (Royal Veterinary College, University of London)



I was lucky to be introduced to biomechanics by Henry Bennet-Clark during my zoology degree at Oxford. After that, Roland Ennos (during a Masters in Research at Manchester) showed me the value of simple geometric models for understanding how structures (feathers, leaves, trees) work. Our study of buttercups demonstrated that the stem at the base of water crowfoot are relatively weak, and may act as a 'mechanical fuse', protecting the roots from being torn out of the river bed during spate conditions.

My PhD under Charlie Ellington at Cambridge followed on from his group's work showing the presence and contribution to lift of 'leading-edge vortices' in insect flight. Charlie's inspired reduction of flapping flight to simple revolving model wings on a propeller led me to determine that many of the peculiarities of animal flight and, for that matter, the aerodynamics of falling maple seeds might be dominated by three-dimensional effects rather than the 'unsteady' aerodynamics that had previously been assumed. High lift is achievable with steadily revolving wings at high angles of attack. However, they come at the cost of exceedingly high drags and powers which is presumably why the aeronautical industry was not already familiar with such aerodynamic phenomena.

My introduction to terrestrial mechanics came during a post-doc with John Bertram, then at Florida State University. In particular, John's enthusiasm for collision mechanics applied to animals led us to approach such questions as: Why do gibbons have long arms? Not so that they can swing faster, but perhaps to allow them to choose safer ballistic paths between handholds while ameliorating the energy losses due to the associated collisions safe paths cannot perfectly match ballistic and swinging phases.

My next post-doc, with Andy Biewener at Harvard's Concord Field Station, gave me the chance to develop techniques for attaching

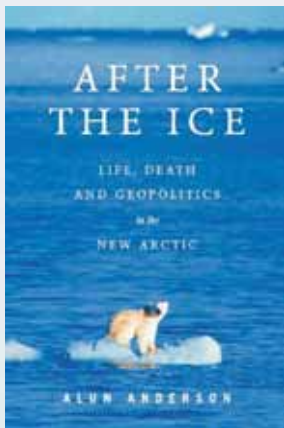
pressure sensors through bird feathers in order to gain a novel (though definitely imperfect) measure of the aerodynamic forces and powers required for flapping. It appears that, like insects, slow flight in birds requires far more power than would be expected from similar sized helicopters slow animal flight is (aerodynamically) 'inefficient'.

I returned to the UK to join Alan Wilson's Structure and Motion lab at The Royal Veterinary College. I started as a post-doc on terrestrial locomotion, demonstrating: reduction in bend-running performance in humans is consistent with limb force limits; that greyhounds do not appear to be similarly constrained; and that humans can walk relatively faster than ducks because they drive their limbs relatively quickly.

I am now coming to the end of a Wellcome Research Career Development Fellowship, principally looking at the powers of bird flight (which can be remarkably high, and therefore of basic interest to both athletic and geriatric performance) again using the pressure sensor techniques. I just started a BBSRC project investigating walking mechanics in bipeds ranging from pheasants to toddlers; and am now starting an EPSRC-funded project with Alan, 'Cooperative Aerodynamics and Radio-based Dynamic Animal Localisation', that will see pigeons and geese flying with ever more complex and informative instrumentation... why is flying in a 'V'-formation so uncommon?

# SEB BOOK ANNOUNCEMENTS

The SEB is pleased to announce the recent publication of the following books by Alun Anderson (honorary member of SEB Council and former editor-in-chief of New Scientist), and by SEB member, Susanne Lipfert who, having recently completed her PhD, has had her thesis published as a book.



Alun Anderson

## After the Ice

For more information contact Barbara Teszler  
barbara.teszler@harpercollins.com

Smithsonian books/Harper

ISBN 9780061579073

“Even as climate change opens up the Arctic, so this book opens up our minds to dramatic developments in that part of the world economic, geopolitical and environmental. Based on meticulous research and personal “witness,” After the Ice is a “must read” for anyone interested in what has now become the epicentre of climate science and climate politics.”

**Jonathon Porritt,**

*Founder and Director, Forum for the Future and the former director of Friends of the Earth UK*

“In the rapidly defrosting Arctic north, a new world is being born. As the vanishing domain of the polar bear instead becomes that of the oil driller, Alun Anderson paints a vivid and unique portrait of a fascinating region whose future will be very different from its past.”

**Mark Lynas**

*author of High Tide: News from a Warming World*

Susanne W. Lipfert

## Kinematic and Dynamic Similarities between Walking and Running

ISBN: 978-3-8300-5030-8

Verlag Dr. Kovac, Hamburg, Germany, 2010

The extensive debate on whether or not amputee runner Oscar Pistorius would have a considerable advantage over able-bodied runners at the 2008 Olympic Games of Beijing put forth the concern that human technology has started to get the better of nature. However, prosthetic walking devices and robotic systems to date give no reason for a generalization of this concern. There is a lack of generally accepted basic understanding of human gait mechanics. This book contains an extensive database of kinematics and dynamics in human gait for a wide range of speeds. The capability to perform two different gaits with the same two legs is investigated based on similarities between walking and running.

If you would like your book to be announced in future issues of the SEB bulletin please contact the editor (see page 2).



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# SEB Business

## NOTICE OF THE ANNUAL GENERAL MEETING OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY

This is notice that the annual general meeting of the members of the above-named organisation will be held at Charles Darwin House, 12 Roger Street, London, WC1N 2JU, on Tuesday 20th April 2010 at 2pm.

The business of the meeting will be:

1. Reports from Honorary Officers
  - a. Report from the President
  - b. Report from the Honorary Treasurer including presentation of the annual audited accounts and reports for the financial year ended 31st August 2008 and approval of auditors
  - c. Report from the Honorary Publications Officer
  - d. Report from the Honorary Animal Section Chair
  - e. Report from the Honorary Cell Section Chair
  - f. Report from the Honorary Education Section Chair
  - g. Report from the Honorary Plant Section Chair
2. Election of New Officers to the Society
3. AOB

## MINUTES OF THE 2009 ANNUAL GENERAL MEETING OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY

The annual general meeting of the members of the above-named organisation was held at the SECC, Glasgow, on Sunday 28th June 2009 at 12.30pm.

Present:

Ian Johnston, Gudrun De Boeck, Vera Viera, Mike Burrell, Christine Raines, Martin Watson, Pat Heslop-Harrison, Rod Wilson, Kath Sloman, Keith Lindsey, Martin Parry, Shaun Killen, Tom Weihman, John Bryant, Shugo Watabe, Paul Devlin, Chris Wood, Nic Bury and Jeremy Pritchard.

In Attendance:

Sarah Blackford, Chris Trimmer.

### 1. Reports from Honorary Officers

Reports were given to the members attending the AGM as detailed below.

- a. Report from the President and Council

It is likely that 2008-9 will come to be regarded as a very important year in the development of our Society. Over the last year Council has been thinking strategically and exploring how it might work together with other Societies to promote and increase the impact of experimental biology. The SEB with its ethos of interdisciplinary studies and organismal biology has the opportunity of playing a pivotal role in linking the modern "omic" technologies with ecology and evolution and is therefore a natural partner for the British Ecological Society (BES) and Biochemical Society (BS). In March I signed a Memorandum of Understanding with the BS and the BES at a short ceremony held at the House of Commons

which was witnessed by Lord Hunt (Minister for Sustainable Development and Energy Innovation and Deputy leader of the House of Lords) and Mr Phil Willis MP (Chair of the Innovation, Universities and Skills select committee). The BES, BS and SEB have distinct, but overlapping phenotypes exemplified by some cross-membership. All three share common charitable objectives as learned societies, own world-class journals that support their activities and all are based in the UK with very significant international memberships. The MoU commits the SEB to working together with the BES and BS, particularly in educational and outreach activities. We also agreed to hold more joint sessions at each others meetings and to organise joint symposia in areas of mutual interest. The first opportunity for such a joint symposia to be held in 2010 has just been advertised with a deadline for proposals of 1st July. In December, the Council explored a proposal to go one step further and co-locate with the other Societies in central London. The Council concluded that whilst co-location was desirable in principle it did not have sufficient visibility on the benefits and costs to justify making a firm decision in favour. However, to explore this further we approved temporary administrative support for Chris Trimmer in order that she could devote more of her time and energy to drawing up a business plan that could be considered at our April meeting. An

enormous amount of work was done by the Societies in the months that followed, particularly by the three Chief Executives. More than 20 potential buildings in central London were viewed and a leading candidate was identified and visited by the three Presidents. The identification of a building meant that more concrete plans for co-habitation could be drawn up including plans for joint ownership and governance as well as the likely costs. Excellent progress was made and Council was particularly pleased with the close working relationship that had grown up between the three CEOs. In April, Council unanimously agreed that the co-location proposal was affordable and in the long term interests of the Society and it made the decision to proceed with a joint offer for 12 Roger Street which is close to Holborn and Goodge Street tube stations. 12 Roger Street is an imposing 5 story building with courtyard built in 1959. It was last used as government offices and was on the market 1 year ago priced at considerably more than our final offer. Plans have been drawn up to refurbish the building at a likely cost of £1.3 million and a project manager and contractor appointed. The SEB will initially own 7.4% of the refurbished building financed from cash reserves and if required, a modest mortgage on our current property in Southampton. The later will be retained for the time being until property prices improve and then a decision will be taken

on whether to sell it or retain it as part of our portfolio of investments. It is the intention that in the future all our activities will be based in London although Council will endeavour to avoid compulsory redundancies. The refurbishment of 12 Roger Street which will be named "Charles Darwin House" is likely to take 6-12 months. The ground floor of the building will be a common space for the three Societies and contain a reception area and meeting space. The meeting space will be configurable as a series of meeting rooms for committees or as a 150 seat lecture theatre where we can hold scientific meetings. There will also be sufficient space for "break-out" and poster areas leading onto the courtyard. One floor will provide open plan office space for the three Societies allowing close cooperation on some "back office" functions. Another floor will provide accommodation for BS publication activities whilst the remaining two floors will be let out to earn income, with preference given to other learned Societies. Major decisions relating to the use and operation of the building will require the agreement of all three Societies whereas minor matters will be dealt with on the basis of a simple majority. With this move the SEB will be at the heart of an influential hub of non-medical biological learned Societies and will be well placed to advance the cause of experimental biology which is our prime rationale. The central London location should also make for easier travel for many committee members, particularly those coming from continental Europe.

This time last year at our annual budgetary meeting the SEB faced the prospect of several years of projected deficits. The Council therefore set in train measures to reduce costs without adversely affecting our program of scientific meetings. These measures have been largely successful and together with buoyant income generation by our Journals led to a retained surplus which has gone towards the capital costs of the new building. During the year Council asked Richard Napier to conduct a review of the Journal of Experimental Botany. This review led to the creation of a smaller more nimble management committee for the Journal comprising Mary Traynor (Managing Editor), Jerry Roberts (Editor), Martin Parry (Deputy Publications Officer) and a representative of Oxford University Press (the publishers of the Journal) by invitation. Council enthusiastically accepted the first business plan of this new group which set ambitious targets for the Journal such as for it to return 20% of subscription income to the Society. Later we also received a 20:20 vision presentation from Jerry Roberts and Council was pleased with the increase in impact factor, the reduced time from submission to

publication of manuscripts and his forward looking plans for developing the Journal. In another development, Council approved a business plan for the re-launch and self-publication of the Experimental Biology Review book series submitted by the Publication Officer, Mike Burrell. In steady state it is planned to launch 4 books a year on topical issues to generate further income for the Society.

This is my last month as your President and I would like to take the opportunity of thanking all the Council members, officers and staff of the Society for their hard work, dedication and support. I have been particularly pleased to observe how well the governance reforms made by Council have worked in practice enabling it to act decisively and strategically. We owe a particular debt to the three Independent members of Council who have so generously given of their time and expertise over the year.

- b. Report from the Honorary Treasurer including presentation of the annual audited accounts and reports for the financial year ended 31st August 2008 and approval of auditors

The accounts for the financial year ending 31st August 2008 were presented to the members. The auditors (Tudor John) were approved.

#### Report from Honorary Treasurer

Last year I wrote that although the Society was in a strong financial position, the future was far from certain. So it remains, with (at the time of writing) the economic outlook remaining uncertain. Our overall position at the end of the last financial year (August 2008) was solid. On the day to day budget we made a profit this year. However, the turmoil in the stock market meant that, although our portfolio out-performed the market, we made an overall loss in 2008. I am confident though that with prudence our financial position will remain sound in the years to come.

As ever there are thanks due to numerous people. Ian Johnston (President), Pat Heslop-Harrison (Vice-President), Mathis Riehle, Keith Lindsey, Richard Handy and Jeremy Pritchard (Section Secretaries), Sarah Blackford (Education & Public Affairs officer) and lastly Len Evans (Secretary and Investment Officer) who are valued colleagues. Special thanks go to Chris Trimmer I cannot over state the value of her and the other employees of the Society. Heather Budd is responsible for the day to day financial management of the Society and is the one who keeps me on my toes. Kate makes up the team and their endless good humour and hard work often goes

unnoticed, but not by me!!

So how did we do financially for the year ending 31st August 2008 and what are our prospects for the future? Our accountants, Tudor John, must be thanked for the friendly, efficient and believe me thorough preparation and audit of our accounts. The total assets at the end of the year were £1,633,264 (2007: £1,648,515) so a slight decrease but still a healthy position. Reviewing our "cash-flow" for the year as a whole there was a surplus of income over expenditure of £56,885 (a deficit of £53,918 in 2007).

Our major source of income in recent years has been from the Journal of Experimental Botany and The Plant Journal. Both of these have had another good year and are generating revenue for the Society averaging in the region of £200,000. Realised fixed asset investment income has decreased sharply from last year's £82,663, but this was inevitable given the market conditions. Subscriptions decreased at £27,664 (2007: £38,531), but this looks set to increase again in 2009.

The Annual Main Meeting in Marseille attracted 650 delegates, which was less than hoped for and this combined with the strength of the Euro meant the meeting made an additional loss on top of the £130,000 subsidy to speaker expenses. As a result, predictions for delegate numbers for the 2009 meeting in Glasgow have been very conservative. It is always difficult to predict the financial outcome of meetings as numbers are almost impossible to predict year on year.

Our investment in educational activities continues. These have been a real success and much praise to Sarah Blackford for all of her efforts. In addition to her educational activities Sarah is also responsible for the Bulletin which has moved to predominantly online publication (2 issues per year online and one bumper issue printed). The remainder of Society expenditure is concerned with running costs. We now have a firm lid on this expenditure and almost every category came in on budget. One last, but very important, point, as will be reported elsewhere in more detail than here, the Society is about to move its operations back to London. We have joined with two other learned societies, the British Ecological Society and the Biochemical Society, in purchasing a new headquarters in London. This will have a considerable impact on our finances, effectively converting a large proportion of our assets into 'bricks and mortar'. The exact final cost of this is uncertain, so at this stage it is better not to give any more details. I can promise that all will be revealed in future budget reports.

c. Report from the Honorary Publications Officer

Before the Honorary Publications Officer presented the Publications Report he thanked the hard work of all journal employees for a successful year. In addition to this congratulations were given to Prof Keith Edwards, the Editor-in-Chief of PBJ for outstanding results in the performance of the new journal and the increase in Impact Factor.

**Publications Report**

Our journals have had another successful year both in attracting good science and financially. Plant Biotechnology Journal has broken even this year which is an extremely good success story. The journal has clearly found a niche and is steadily embedding itself in the list of must have journals. We need to thank Keith Edwards and his team for this. The financial viability of the society depends on its journals and both TPJ and JXB have returned a substantial sum to the Society this year without which the membership would not have its meetings at such a low cost; but what is the cost of publishing?

My colleagues frequently complain about the cost of journals but who is to blame? Sadly much of the blame lies with the scientific authors themselves. Every figure, table, poor title etc., not conforming to layout and submission requirements requires people to examine it, decide on whether it needs to go back to the author, correct it, get corrections checked and so it goes on. Every correction therefore adds to the cost of the journal.

Council at its last meeting approved the launch of our revamped book series as Essentials in Experimental Biology. This will be a print on demand and online publication. To support this venture and expand it we will be appointing a Publications Manager in the SEB office. The aim is to price the book very competitively and to sell individual chapters. At the time of writing three volumes are in preparation. The one way we can all help both the Society and its publications is by suggesting through your committees or directly to the Publications Committee ideas for topics. If you want to hold a meeting then funds can be found to help and the journal will benefit from topical high quality science. It really is a win-win situation.

As usual I would like to finish with thanking everybody in the SEB office and involved with our publications for all their efforts. I must single out this year Harry Klee who stands down as Editor in Chief of TPJ having kept the journal moving steadily forward against stiff competition. We wish Christoph Benning every success as he takes over at the end of the year.

d. Report from the Honorary Animal Section Secretary

There was no report from the Animal Section.

e. Report from the Honorary Cell Section Secretary

There was no report from the Cell Section.

f. Report from the Honorary Education Section Secretary

The SEB Education and Public Affairs Section is committed to a wide spectrum of activities as it works to support its members and the bioscience community as a whole: we have delivered over 10 career development workshops to postgraduates and early-career researchers Europe-wide over the past year (with organisations such as EuroBio, EMBO, EPSO, and the Physiological Society); we have negotiated, with the Plant Section, a Memorandum of Understanding with the European Plant Science Organisation (EPSO) so that we act as a conduit for policy information to promote a coherent voice for plant scientists in Europe; we work closely with member organisations of the UK Biosciences Federation (BSF)\* so that, again, we speak to government with one voice; we run joint education, outreach and careers events throughout the year with BSF societies in the UK; we are in talks with the Biochemical Society and British Ecological Society Education committees to work even more closely as the SEB relocates its main office back to London in a cohabitation agreement made with them in April this year.

**EPA in Glasgow 2009**

We will be over half-way through the Year of Darwin when I deliver my report at the AGM during the SEB Annual Main Meeting in Glasgow at the end of June 2009. By that time we will have staged a 2-day cross-sectional session centred on key discoveries in the field of Bioscience since Darwin wrote his seminal work ‘The Origin of Species’ 100 years ago. This session, The Evolution of Evolution has become the centre-piece of the SEB Meeting over the past few years and with high-profile speakers such as Peter Finch (Galapagos Finches), Walter Gehring (Evolution of the Eye) and our former SEB president, John Raven (Evolution of Plants) this year is no exception. As I write this report we are planning to video some of the talks in order to preserve them for viewing on our website as part of our Education and Public Affairs remit to promote public engagement in science and to support the teaching of our members and the public. We have asking the speakers to pitch their talks at a level

which will lend themselves to a research-led teaching tool at university and post-16 teaching which, of course, will also make them accessible to our multi-disciplinary audience too. Furthermore the last section of the session will focus specifically on useful tools for teaching evolution in schools and in university.

Following straight on from this session we will turn our attention to our 2-day complementary outreach event which we are staging in the adjacent Glasgow Science Centre. This rather more colourful event aims to inspire the public with a science show and interactive exhibits. We are partnering with organisations such as the British Ecological Society, the Bat Conservation Trust, the Botanic Gardens in Glasgow and Edinburgh and the American Society of Plant Biologists (ASPB) to deliver this ambitious public show. In addition, we will extend this whole event by exchanging our expertise at the ASPB Meeting in July which will turn parts of the project into a sustainable teaching tool accessible and relevant to bioscience teachers worldwide.

**EPA moving forward**

So what are our plans for the future? We are excited by the prospect of staging our first SEB Symposium in 2010 which will focus on food security and safety. It is envisaged that this symposium will have a high impact and act as a springboard for a continuum of post-meeting events and production and distribution of associated resources. For example, teaching tools and resources, publications (scientific research and school), public outreach events such as Cafe Scientifique and school debates. We already have an excellent programme of events formulated for the SEB Meeting in Prague next year. We will continue with our pre-conference event to assist early-career researchers, postgraduates and new SEB members to get to know each other a little before the meeting proper kicks off the following day. Due to its increasing visibility on the research agenda we have proposed a session on Research Impact, which will also focus on the requirements for successful European funding bids, managing information networks and associated aspects of the process. In 2010, the year of Biodiversity, we will introduce a full day session on Measuring Biodiversity and are collaborating with other societies, discussion is already underway with BS and BES education sections who are interested in collaboration in this area.

In terms of the bigger broader picture, these are exciting times for those of us engaged in what were seen previously as ‘added value’ activities but which are increasingly emerging centre-stage as government policies evolve. We are committed to

working more closely with our cohabitantes, the Biochemical Society and British Ecological Society but we are committed to the overarching mission of the SEB to support the whole of its membership and to make its charitable services available to the bioscience community worldwide. This is evidenced by ongoing and reciprocal collaboration with the ASPB education section.

In conjunction with the BS and the BES we are identifying key areas which will benefit from our support such as research-led teaching tools, career development (only 1 in 8 post-doctoral researchers will secure an academic position). We are positioning ourselves to take advantage of the reorganisation BSF and IOB to influencing policy at the highest levels in the UK and Europe, partnering appropriate and like-minded societies and organisations to maximise our influence and, most importantly, ensuring we stay supportive and relevant to the needs of SEB members. On that note, please get in touch to discuss ideas or issues in which you think we may be able to support you in education and/or public affairs by emailing myself or Sarah Blackford, the Education & Public Affairs officer (s.blackford@lancaster.ac.uk).

Finally, I would like to acknowledge the retirement of John Bryant from our Section this year his energy and constant enthusiasm will be missed but he has promised to stay in touch and offer his expertise wherever necessary. So many thanks John as we say "Au revoir but not goodbye".

g. Report from the Honorary Plant Section Secretary

This is my last report as Honorary Plant Section Secretary, and so I would like to take this opportunity to thank past and present Section Committee members, and other SEB colleagues, for making my last four years less of a job and much more of a pleasure. Election of the new Honorary Secretary is ongoing as I write this report, and I wish my successor well. The nature of the biennial Plant Section Committee meetings has shifted slightly, with the inclusion of a broader discussion session. This has proved to be very enjoyable and useful, a chance to discuss the big issues affecting plant biology in the widest context, and with a view to informing policy within and beyond the society.

The Plant Section has been very active over this last year. The Annual Main Meeting in Marseilles was successful, both in terms of the scientific sessions we put on and as an outstanding venue. One view reported back concerned the relatively large number of parallel (and competing) sessions, which

we will try where possible to avoid in future planning. We will also introduce a themed set of sessions. It is hoped that this will provide a focus to the plant-centred part of the meeting, and generate some 'critical mass' in the science, that attendees should appreciate. The session for younger scientists (previously known as the 'Developments in Plant Biology' session, organized very effectively by Christine Raines), is rebadged as the 'Young Scientists in Plant Biology' session, for clarity. We also hosted the 2008 Symposium, this time organized jointly with GARNet and held at Sutton Bonington, on the theme of 'Plant Development in a Changing Environment'. Again, the science, attendance and venue were all excellent, and I'd particularly like to thank Ruth Bastow and Kate Steel for their fantastic organizational efforts. The link with GARNet works, and I hope it will continue. The Plant Transport Group held its satellite meeting at the beginning of September in Manchester. Other good news from the past year was that Stuart Casson (Bristol), the SEB Plant Section nomination for a FESPB Young Scientist Award, was successful and he received his prize at the Tampere meeting.

This summer, the Glasgow AMM provides a series of exciting plant biology sessions: 'Membrane Transport in Biotic and Abiotic Stress' (organized by Anna Amtmann and Mike Blatt), 'Flowering and Reproduction' (Stephen Jackson), 'Plant Responses to UVB' (Gareth Jenkins), 'Photomorphogenesis' (Matthew Terry and Paul Devlin), 'Young Scientists in Plant Biology' (Christine Raines) and 'Modelling Plant Systems: Molecules to Agro-ecosystems' (Mary Traynor and Francois Tardieu, in association with the Journal for Experimental Botany). In addition, the Plant Section is coorganizing 'Leaf Form and Function' with the Cell Section (Andrew Fleming and Jim Murray), and the cross-disciplinary celebration of Darwin in 'The Evolution of Evolution' (led by Jeremy Pritchard of the EPA Section). Jans Lohmann (University of Heidelberg) has been nominated as the Plant Section's President's Medallist, for his outstanding work on plant development. The AMM is preceded by the Phoenix 2009 meeting, 'Protein Complexes in Signalling and Development', held at the University of Glasgow on 25-27 June and also organized by Anna Amtmann and Mike Blatt. Plans for the 2010 AMM in Prague are well in hand, with a focus around the theme of 'Plant Stress'. Heather Knight and Kerry Franklin are organizing a satellite meeting, 'Plant Temperature Response Networks' in the autumn. The Section is also supporting the 'Agriculture in Africa' meeting at Rothamsted (12-14 October), organized by Christine Foyer and others.

So plenty of great things ahead for the Plant Section. The Society provides enormous value for money, especially for PhD students, whose attendance at the meetings is heavily subsidized and who can access travel grants. Make the most of the opportunities on offer and support plant science!

## 2. Election of New Officers to the Society

As the Society has now instituted the new election procedure agreed at the 2008 AGM by a Special Resolution, the positions listed below have been elected/decided by the new process so no longer require a proposer and seconder.

### Council

- Prof Pat Heslop-Harrison becomes the new President of the Society.
- Prof Keith Lindsey becomes the new Vice-President of the Society.
- Dr Martin Watson continues as the Honorary Treasurer for a final four years.
- Prof Mike Burrell continues as the Honorary Publications Officer for a final four years.

### Plant Section

- Prof Christine Raines becomes the new Plant Section Secretary.

### Animal Section

- Dr Michael Berenbrink becomes the new convener for the Respiration Group.
- Dr David McKenzie becomes the convener of the newly formed Energetics and Physiology Group.

### Cell Section

- John Love becomes a member of the Cell Section.

## 3. AOB

Special mention was given to the retirement of Prof John Bryant from involvement in the governance of the Society. John has been involved in the activities of the Society since 1981 and has held numerous positions including, Section Secretary for both Plant and Cell Sections, Vice-President and President. The President expressed his thanks to John on behalf of the Society and looks forward to John's continuing involvement in the future.

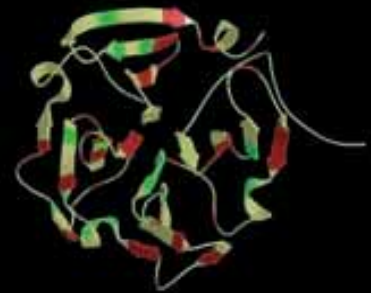
Thanks were given the SEB Team for their hard work over the last year and special thanks were given to Prof Ian Johnston for his achievements as President over the last two years.

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# FESPB 2010

XVII Congress of the Federation of European Societies of Plant Biology (FESPB)

Valencia, Spain  
4-9 July, 2010



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www.fespb2010.org

# Travel Grants

Interested in applying for a travel grant? Visit [www.sebiology.org](http://www.sebiology.org)

Deadlines for applications for the next two rounds are: 30<sup>th</sup> June 2010 and 30<sup>th</sup> September 2010

Franck Fourniol	Birbeck College	ASCB Conference, San Diego & lab visit to the Scripps Research Institute
Dr Joseph Zolnerciks	University of Washington	FEBS Special Meeting on ATP-Binding Cassette Proteins
Dr Richard Quilliam	Bangor University	AAB workshop on Positive Plant-Microbial Interactions
Arpan Kumar Rai	Tata Institute, Mumbai	ASCB meeting, San Diego
Robert Palin	University of Birmingham	UMR 6th Plant Biomechanics Conference. Kourou, French Guiana
Kimberly Ong	University of Alberta	Collaboration with Dr Loo Say Chye Joachim, Singapore
Swadhin Jana	Tata Institute, Mumbai	ASCB meeting, San Diego
Astrid Willener	Roehampton University	Research on La Reunion in the Indian Ocean .
Tasha Ritchie	University of Washington	FEBS Special Meeting on ATP-Binding Cassette (ABC) Proteins, Innsbruck
Karen M. Young	University of Queensland	SEB Annual Main Meeting, Prague, Czech Republic
Jenny Landin	University of Exeter	Visit to Prof Svante Winberg Laboratory, Upsala University
Sanna Olsson	Helsinki University	FESPB 2010, Valencia, Spain
David Benoist	University of Leeds	Biophysical Society 54th Annual Meeting, San Francisco
Biswa Sengupta	University of Cambridge	"Computational & Systems Neuroscience" conference, Salt Lake City Utah
Erika Eliason	University of British Columbia	Research on muscle morphology in sockeye, University of Birmingham
Suman Nag	Tata Institute of Fundamental Research	Biophysical Society 54th Annual Meeting, San Francisco
Lisa Kirkwood	University of York	American Associates for Cancer Research 101st Annual meeting 2010, Washington DC, USA

## Multi-scale muscle mechanics workshop, Boston

I presented a poster at this workshop, for which I was awarded a young investigator prize and refunded my workshop registration fee. The workshop was a fantastic event where I met many senior academics and was able to introduce them to my research without the usual busy, rushing atmosphere of a larger conference. Although several people visited my poster, I was also able to demonstrate some of the other work we're currently undertaking using a prepared presentation. This was particularly valuable because I discussed and resolved several

biomechanical problems during these discussions.

After the workshop I visited Harvard University's Anthropology department, where I gave an informal presentation of my current research to Prof. Daniel Lieberman and met the other, junior, members of his group.

After visiting Harvard, I flew to Raleigh, NC and visited Daniel Schmitt's Anthropology laboratory at Duke University. I gave a short presentation to his group there and the following day we visited the Lemur centre where they conduct the majority of their biomechanics research.

Overall I think the trip was extremely

valuable to my personal development and profile. I feel more confident approaching senior academic staff with research questions and ideas because of the informal nature of the workshop. Further, I recognise many more collaborative and employment opportunities open to me than I previously thought, both in the USA and UK. Without doubt the funding provided to me has increased my confidence, scientific profile and employment prospects for after my PhD submission. I am therefore extremely grateful to the Company of Biologists for the grant award, without which this trip would not have been possible.

**Anthony Channon**  
University of Liverpool

## 2nd European Congress for Conservation Biology, Prague

From 1-5 September 2009 I attended the 2nd European Congress for Conservation Biology in Prague, Czech Republic, with travel funding gratefully received from the Society for Experimental Biology/Company of Biologists Travel Fund. The conference was held at the Czech University of Life Sciences, and was a well attended event of 1200+ people from 46 countries within Europe and beyond.

I travelled from my current location in Vancouver, British Columbia, to present results from my post-doctoral research. The

title of my oral presentation was "Conservation genetics of the Coastal Giant Salamander (*Dicamptodon tenebrosus*) in Canada: Patterns within a deforested landscape" (Rachael Dudaniec and John S. Richardson). The talk outlined preliminary findings that show decreased genetic variation (allelic diversity and heterozygosity) with increasing elevation of streams, situated on the northern periphery of the salamander's range. This was coupled with higher genetic relatedness at higher elevation streams, and a lower frequency of bodily injuries (i.e. missing limbs, scars, cuts). Larvae of *D. tenebrosus* are known to be aggressive towards one another, resulting in cannibalism or bodily injuries. Theory predicts reduced conspecific aggression

between more highly related individuals compared to less related individuals. We found that the occurrence of injuries was higher in larvae captured in streams with lower mean genetic relatedness, supporting this theory in behavioural ecology. The conference had a diverse array of presentations, with studies from within and beyond Europe, and boasted a great atmosphere for meeting new people and networking. Furthermore, the location in Prague and the conference's extensive social and field-trip program made the week even more entertaining with the potential for making new contacts and friends.

**Rachael Y Dudaniec**  
University of British Columbia

## European Society for Evolutionary Biology (ESEB) Annual Main Meeting

I would like to thank the Society for Experimental Biology and Company of Biologists for providing me with the financial means to attend the annual meeting of the European Society for Evolutionary Biology (ESEB), held Aug 24 - 29 2009 in Italy. The ESEB meeting was held in the "Politecnico di Torino" in Turin and 1500 people were present. Around 250 oral presentations and 750 posters were divided over 31 symposia and provided plenty of material for discussions and far too much choice to be able to hear and see all interesting parts of the program. Most symposia had at least some speakers of interest and it was a challenge to find the best route between lecture theatres and

poster stands, in order to make the most of it all.

The "Evolutionary Applications" symposium, in which I presented a poster, occupied most of the second day of the conference and comprised a range of fascinating research on evolutionary aspects of contemporary issues; from phylogeography of HIV transmission to antibiotics resistance and fisheries induced evolution. The latter topic was where my own research fitted in best. I use selection experiments on guppies to try and identify genes that are involved in response to harvesting selection, and it was exciting to meet some more of the people working on this subject and hear about the frontline research in this field.

One of the conference's highlights for me was meeting two people I had wanted to meet already for a long time. I did not know they were present at the conference, and was

pleasantly surprised when they found me through my poster and we had a very interesting conversation. Since then, a valuable collaboration has developed, which on its own made the conference already very worthwhile.

Besides the interesting presentations and discussions, I greatly enjoyed spending time in Turin with such a large party of biologists. I met many old friends from my previous Universities and got to know people of which I had only heard before. The conference was a great success and worthwhile from both a scientific and social perspective. It gave rise to fruitful collaborations and refreshed my enthusiasm for research. It was a valuable experience, and I thank the SEB for giving me the opportunity to enjoy it.

*Serinde van Wijk*  
Bangor University, UK

## Acoustic Communication Course, University of Southern Denmark

This unique summer course is only offered every three years through the SNAK graduate school at the University of Southern Denmark. The SNAK graduate program specializes in the study of sense organs, nerve systems, behaviour, and communication. I was selected as one of 20 students out of 69 applicants to participate in the acoustic communication course this year.

This two-week intensive course was taught by leading academics in the field of acoustic biology, who made the course accessible to a wide range of research topics. The course itself was split into two focuses: Water and Air. Despite a difference in equipment and study species, the lecturers did an excellent job of combining theory and concepts that applied to both. The course was split between lectures and practicals, and was focused on methods - we were encouraged to use different pieces of acoustic equipment and programs in an open setting where we could ask lots of questions. I think the most

valuable part of the experience was meeting lots of different researchers and students, learning about all the different study species and types of research that go on in the field of bioacoustics that we could one day be a part of.

Thanks to the generous funding provided by the Society of Experimental Biology and the Company of Biologists I was able to attend this course, and am extremely grateful for the opportunity.

*Kathleen Lucas*  
University of Bristol

## Visit to the Institute of Agroecology, University of Göttingen

I am writing to express my deep gratitude for your valuable support for my visit to the Institute of Agroecology, University of Göttingen in Germany from 19 to 30 October 2009. The main result has been a chapter which was submitted to editors on 7 December for publication.

The chapter in authorship with 4 authors is entitled: "Services from plant-pollinator interactions in the Neotropics". Authors are Lucas A. Garibaldi, Nathan Muchhala, Iris Motzke, Liliana Bravo-Monroy, and Alexandra Maria Klein. This chapter will be published next year in a book entitled Payment for Ecosystem Services in the Neotropics. My particular contributions to this chapter were two topics corresponding to the items: Socioeconomic drivers affecting pollination services, and Pollinators and coffee production in the Neotropics.

Further to the collective writing of this chapter, there were several opportunities valuable to my formation. For instance, to be involved in another research group with a different dynamics, led by a researcher, one of the experts on coffee pollination at an international level. Equally, my participation in discussion papers seminars, as well as to present my research project resulting in a constructive feedback. I was included in a variety of intellectual exchanges ranging from informal meetings, roundtables, to presentation of research seminars. I was provided access to office space and equipment that facilitated me in the writing of my work.

Thus the opportunity to have visited the University of Göttingen with its extensive ecological and environmental academic communities at the Göttingen Research Campus was extremely enriching and rewarding for my personal and professional development.

*Liliana Bravo-Monroy*  
University of Reading



## 16th International Society of Developmental Biologists Congress

The ISDB congress, which takes place once every four years, showcases the world's top research in the Developmental Biology field. This year's congress took place in the beautiful Scottish city of Edinburgh, and it was hosted by the British Society for Developmental Biology (BDSB). There were four days of plenary sessions and parallel symposia, and the kick-off talk was given by the Nobel prize-winner Eric Wieschaus (Princeton, USA), on patterning of transcription and morphogenesis in early *Drosophila* embryogenesis. The parallel

symposia featured several themes, ranging from "Non-coding RNA in Development" to "Behaviour and Neural Circuits", with a few sessions each on stem cells, morphogenesis, signalling, and, partly to mark Charles Darwin's 200th birthday, "Darwin and Development" sessions, which featured a variety of talks from the Evo-Devo field. There was also a whole session dedicated to the role of cilia in development, which particularly highlighted the recently discovered role of these organelles in the Sonic Hedgehog signalling pathway in mouse and possibly in other vertebrates.

Two major prizes were awarded at this meeting: the BDSB's Waddington Medal, given to Liz Robertson (Oxford, UK), and the

ISDB's Ross Harrison Prize, awarded to Eddie De Robertis (Los Angeles, USA). During the meeting, it was also announced that the next ISDB congress, to take place in 2013, will be hosted by the Latin-American Society for Developmental Biology (LASDB) in Cancun, Mexico.

I would like to express my gratitude to the SEB for generously awarding me with a COB travel grant, which allowed me to attend the ISDB 2009 and present a poster with my work on mechanisms of neural development, titled "Notch activation is required for response to BMP inhibition in neural induction".

**Ana Rolo**  
University College London

## Monkey business

Over the summer of 2009 I joined up with Fauna Forever-Tambopata (FFT) to work for 6 weeks as a volunteer research assistant looking at the effects of ecotourism on the biodiversity of the wildlife in the Tambopata National Reserve (TNR). The TNR in the Amazon rainforest is a protected area of south-eastern Peru covering 274,690 hectares, and was created in 2000. There are presently around 60 ecotourism lodges, generating large revenue for the region. This is an increasing market with many of the larger and more established lodges keen to bring in more tourists. FFT, established in 1997, is a team of dedicated international and Peruvian biologists, committed to conserving Peru's amazing biodiversity. By studying the effects of the ecotourism lodges they offer advice to maintain and improve the area.

I am a first year zoology student with a keen interest in primates, so was delighted at the chance to join the mammal team. Peru is home to 10% of the world's mammal species, with 100 different species being found in the Tambopata region alone, 70 of these being endemic. Tambopata is also home to 16 vertebrates listed in the IUCN Red Data Book and considered highly endangered such as: giant anteater (*Myrmecophaga tridactyla*), giant armadillo (*Priodontes maximus*), giant river otter (*Pteronura brasiliensis*), jaguarundi

(*Herpailurus yaguarundi*) and ocelot (*Leopardus pardalis*). All of these were observed by the team during my time with the project.

We carried out unbounded line transects to study the abundance and diversity of mammals in the TNR. This involved starting out in the early morning to reach the start of transects before the mammals became active, which was often before sunrise. We would then walk along the transect looking for signs of mammals, such as droppings or footprints, while listening for sounds and ideally, sightings. After observing the mammal for up to 15 minutes we would then take measurements in order to calculate the abundance. At each lodge we had up to 15 transects, 50% of which would be along trails used by tourists visiting the lodge and 50% only used by the researchers. The afternoons would then be spent setting footprint traps, camera traps and inputting data from the morning's sightings.

Additionally, I was given the opportunity to work with the bird team on a number of occasions and interact with the spectacular array of bird species that were caught in the mist nets. This was an additional bonus to the work that I went out to do and has opened up another field of zoology that I have little previous knowledge.

Although no data analysis was carried out during my time on the project, we were given lectures on the previous findings during our training week. It was very encouraging to see that there was little difference in the abundance and diversity of mammals between the tourist and control transects, meaning that there has been minimal disturbance caused by the visiting tourists. However there was a significant difference between the lodges, showing that the surrounding land use played a major role. Lodges that were in areas of gold mining and farming had low abundance and diversity whereas the lodge in pristine



Photo by Paul Greaves of Bolivian Red Howler (*Alouatta sara*)

rainforest with minimal human impact had the most abundant and diverse wildlife. FFT are also setting up Payment of Ecosystem Services (PES) to encourage the local people to preserve and regenerate the rainforest and bring in revenue from ecotourism, which has a low impact on the area.

I have now returned to the UK and have had time to reflect upon my time on the project. FFT is an excellent project to be part of; I saw fantastic wildlife, met new and exciting people from all over the world, got involved in cutting edge tropical wildlife research, and explored the beautiful surroundings!

I am extremely grateful to all the organisations whose generous donations enabled me to participate in such an important and inspiring project. I would like to express my sincere thanks to the Society for Experimental Biology and Company of Biologists.

I am also grateful for the donations made by; Durham University Fund for Students Travelling Abroad, with particular thanks to; the British and Foreign School Society (Sarah Walker Legacy); the Durham University Student Opportunities Fund; the Council of Durham University; the Bruce and Pat McGowan Travel Award and The Provincial Grand Lodge of Mark Master Masons of Durham Benevolent Fund.

**Michala Gardner**  
University of Durham



# SEB Meetings Diary

## **Metabolism & Endocrinology Themed Meeting** 24 - 26 March 2010

The Physiological Society  
AstraZeneca, Alderley Park, Macclesfield UK  
www.physoc.org/me2010 Email: sbarnsley@physoc.org

## **Society for General Microbiology Spring 2010 Meeting** 29 March -1 April 2010

Edinburgh International Conference Centre, Edinburgh - UK  
<http://www.sgm.ac.uk/meetings/>

## **Experimental Biology 2010** 24 - 28 April 2010

Anaheim, CA  
Website: <http://experimentalbiology.org>

## **Society for General Microbiology Spring 2010 Meeting** 29 March -1 April 2010

Edinburgh International Conference Centre, Edinburgh - UK  
<http://www.sgm.ac.uk/meetings/>

## **24th New Phytologist Symposium: Plant respiration and climate change** 11 - 14 April 2010

St Hugh's College, Oxford, UK  
<http://www.newphytologist.org/respiration/default.htm>

## **Agri-Environment schemes 2013** 27 - 29 April 2010

University of Leicester, Oadby, UK  
<http://www.aab.org.uk>

## **Genome Canada: 2010 Applied Computational Genomics Course (ACGC)** 2 - 8 June 2010

Beautiful Victoria, British Columbia, Canada  
[www.gcbioinformatics.ca/training](http://www.gcbioinformatics.ca/training) Email: [training@gcbioinformatics.ca](mailto:training@gcbioinformatics.ca)

## **Advances in Molecular Plant Breeding** 8 - 9 June 2010

Rothamsted Research, Harpenden, UK  
<http://www.aab.org.uk> Email: [carol@aab.org.uk](mailto:carol@aab.org.uk)

## **Gordon Research Conference on Salt and Water Stress in Plants** 13 - 18 June 2010

Les Diablerets, Switzerland  
<http://www.grc.org/programs.aspx?year=2010&program=salt>

## **Nutrition Society Irish Section Meeting: Nutrition - getting the balance right in 2010** 16 - 18 June 2010

University of Ulster, Coleraine, Northern Ireland  
<http://www.nutritionociety.org/node/17>

## **SEB Animal Section Symposium on Intra-specific diversity in aquatic animals** 25 - 27 June, 2010

Sète, France  
<http://www.sebiology.org/meetings>

## **Nutrition Society Annual Summer Meeting: Nutrition and health - cell to community** 28 June - 1 July 2010

Heriot-Watt University, Edinburgh, Scotland, UK  
<http://www.nutritionociety.org/node/17>

## **20th International Conference on Plant Growth Substances** 28 June - 2 July 2010

Universitat Rovira i Virgili, Tarragona  
[www.ipgsa.org](http://www.ipgsa.org)

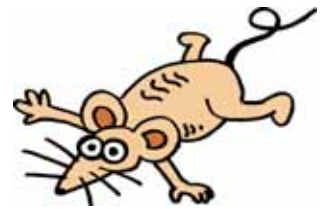
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- SEBatPrague2010 (SEB Annual Main Meeting 2010)** 30 June - 3 July 2010  
Clarion Congress Hotel, Prague  
<http://www.sebiology.org/meetings>
- Physiology 2010: The Main Meeting of The Physiological Society** 30 June - 2 July 2010  
The Physiological Society, University of Manchester, UK  
Website: [www.physiology2010.org](http://www.physiology2010.org) Email: [info@physiology2010.org](mailto:info@physiology2010.org)
- Plant Biology 2010** 31 July - 4 August 2010  
Montreal Canada  
[www.aspb.org/meetings](http://www.aspb.org/meetings)
- IMC9 The Biology of Fungi - 9th International Mycological Congress** 1 - 6 August 2010  
Edinburgh International Conference Centre & Usher Hall, Edinburgh  
[www.imc9.info](http://www.imc9.info)
- XXI International Congress on Sexual Plant Reproduction** 2 - 6 August 2010  
The Victoria Rooms, University of Bristol, Bristol  
UK <http://www.sebiology.org/management/meetings/SexualPlantReproduction.html>
- Global Change and Global Science: Comparative Physiology in a Changing World  
2010 American Physiological Society Intersociety Meeting** 4 - 7 August 2010  
Westminster, Colorado (USA)  
<http://www.the-aps.org/meetings/aps/comparative/brochure.pdf>
- 2010 APS Conference: Inflammation, Immunity and Cardiovascular Disease** 25 - 28 August 2010  
Westin Westminster, Colorado  
<http://www.the-aps.org/meetings/aps/inflammation/>
- Cardiac & Respiratory Physiology Themed Meeting** 1 - 3 September 2010  
The Physiological Society, University of Birmingham, UK  
[www.physoc.org/cr2010](http://www.physoc.org/cr2010) Email: [sbarnsley@physoc.org](mailto:sbarnsley@physoc.org)
- GARNet 2010 - Cell & Systems** 6 - 7 September 2010  
Durham University, UK  
Ruth Bastow at [ruth@arabidopsis.info](mailto:ruth@arabidopsis.info)
- Society for General Microbiology Autumn 2010 Meeting** 6 - 9 September 2010  
University of Nottingham, UK  
<http://www.sgm.ac.uk/meetings/>
- SEB Education and Public Affairs Symposium on Food Safety and Security** 13 - 15 September 2010  
University of Lancaster, UK  
<http://www.sebiology.org/meetings>
- 3rd Symposium on Potato Cyst Nematodes** 14 - 15 September  
Harper Adams University College, Newport, UK  
<http://www.aab.org.uk>
- 25th New Phytologist/Colston Research Society Symposium  
Colonization of the terrestrial environment** 21 - 22 September 2010  
University of Bristol, UK  
<http://www.newphytologist.org/colonization/default.htm>
- Patchy Prague 2010  
Workshop on Plasma Membrane Domains in Fungi and Plants** 10 - 13 October 2010  
Hotel Beranek, Prague 2  
[www.patchyprague.cz](http://www.patchyprague.cz)

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# Rat Bag

A regular diet of gossip titbits overheard by the lab rat



Restructuring? The first time Dr Workhard heard the word from the institutional authorities, he thought that perhaps there would be some investment by the institution in the research fabric of his labs. After all, this little rabbit warren of enclosed spaces was quite out of style in comparison with modern open-plan labs, and in any case the walls could do with a fresh lick of paint. Yes, that toilet-green had indeed been bugging Workhard for years: surely a less oppressive colour would make for a better working environment. The Restructuring Agenda was therefore something that Workhard could surely subscribe to in collaboration with esteemed colleagues in higher places.

So it was with enthusiasm that Workhard greeted the Dean when she came to talk about the Restructuring Agenda. He was surprised at the slightly apologetic demeanour of his former post-doctoral fellow Verity, but thought he might at least engender some confidence in her. It was true that Verity had surpassed Workhard in all scientific aspects of his profession, and her leap-frogging to the Dean position had agonised Workhard sometimes. But when it came to the matter of design and structure, Workhard was confident of his taste, and could indeed help the competent but style-insensitive Verity choose the colour of the paint. However, the conversation did not go quite as Workhard had planned.

“With respect to restructuring, we, the senior management team, have decided that in the current economic climate some less highly achieving colleagues will be made redundant”, Verity said. She added that she was very regretful.

Workhard barely heard the rest. There were phrases like “Redundancy Pool”, “Consultation Period”, “Right to Union Representation” as Verity shifted uneasily in her chair, speaking as though reading from a prepared script. Workhard realised the writing was on the wall, regardless of colour. Even so, a toilet-green coloured his vision.

Yes it was true that he had not published a paper in the last year or two, but surely that might be excused as a slight dip. It was true also that his last three graduate

students had failed to complete a thesis. The research funding had not materialised, and of course, he argued to Verity, this was merely a facet of our troubled economic times. And then this body-blow to Workhard. Verity said that nobody who is anybody does great diabetes research outside a front-rank medical school. So there was the Redundancy Pool in the area of diabetes research: Workhard - he himself.

Economies ebb and flow as do scientific careers. When the economic ebbs coincide with the scientific ebbs then the going gets tough, thought Workhard.

Poor Workhard, ever the decent person, knew what to do. He started packing his office - past papers, mementoes, books galore. Then he looked at me, the LabRat rapporteur that he saved a decade ago from death to tell all of you about the trials of a well-meaning scientist. “At least you’ll be free”, he muttered, as he opened my cage door. “Get out of here, *Rattus norvegicus*, and I’ll wish you the best.”

I’ll scavenge in the wild for a while, but it’s been a decade since my first column and really I’ve run out of steam. So has Workhard. He went home, taking his pension, and in the end saw that his contribution was not that bad: he never solved his diabetes research problem, but he did at least train a generation of people that thought critically. Not least, Verity, he thought in a wild but rather sad moment.

But look at it this way, you Ratbag fans. Science moves on, and biological science especially so. I won’t be back, so it’s up to you to carry the torch. Keep pushing, reminding people of the wider impact that training and research has on people’s lives. And if you forget that point, you might just have this rat nibbling at your heels.

THE END

## University Talks Fund 2010

*Would you like to invite a speaker to talk in your University/Institute?*

The SEB’s Education & Public Affairs Section ‘Speaker Fund’ is available to all SEB members. We are able to fund up to 10 speakers for which you will be able to apply for a maximum funding of £100 to cover travel or accommodation. To apply please send an email detailing the name of the speaker and topic of their talk to Sarah Blackford (s.blackford@lancaster.ac.uk).

We can also send you copies of the bulletin and SEB leaflets to hand out to the audience if required.

**DON'T  
DO  
THIS!**



**DO THIS!**



# Academia - Mastering a Complex Career

Thursday 1st July 2010, Prague,  
During the Society for Experimental Biology Annual Main Meeting

This one-day event, aimed at postgraduate and postdoctoral Bioscientists, will focus on the knowledge impact factors vital for securing an academic position.

**Including:**

- Research careers future perspectives
- Eurodoc survey of the European researcher experience
- Income generation
- Getting your research published
- Commercialisation of research
- Engaging with schools and the public

Posters are invited for this session on topics such as skills training, education methods, careers

The session forms part of the Education and Public Affairs Programme.  
<http://www.sebiology.org/meetings/Prague/Education-Sessions.html>

For more information contact Sarah Blackford, [s.blackford@lancaster.ac.uk](mailto:s.blackford@lancaster.ac.uk)

# Food Security & Safety

Lancaster University, UK 13th - 15th September 2010



## CONFIRMED SPEAKERS INCLUDE:

**Ingo Potrykus** (Humanitarian Golden Rice Board & Network)  
**Francois Tardieu** (INRA)  
**Brian Wynne** (Centre for Science Studies & CESAGen)  
**Kathy Kahn** (Bill & Melinda Gates Foundation)  
**John Kirkegaard** (CSIRO)  
**Elias Fereres** (Cordoba)  
**Camilla Toulmin** (IEED)  
**Larry Busch** (Lancaster University/Michigan State University)  
**Peter Gregory** (SCRI)  
**Geoff Tansey** (Food Ethics Council)  
**Matthew Reynolds** (CIMMYT)  
**Tim Lang** (Centre for Food Policy, City University)  
**Angela Karp** (Rothamsted Research)  
**Ian Crute** (Agriculture and Horticulture Research Board)  
**Charlie Paton** (Sahara Forest Scheme)

## MAIN THEMES

Challenges to future food-crop production  
Conflicting demands  
Opportunities for increasing food production  
Social and infrastructure issues  
Public engagement and ethics  
Food quality and Safety  
Knowledge exchange and regulatory issues

[www.sebiology.org/meetings/Lancaster2010/Lancaster.html](http://www.sebiology.org/meetings/Lancaster2010/Lancaster.html)

## CONTACT:

**Sarah Blackford:** [s.blackford@lancaster.ac.uk](mailto:s.blackford@lancaster.ac.uk)  
**Bill Davies:** [w.davies@lancaster.ac.uk](mailto:w.davies@lancaster.ac.uk)

With the world's population set to reach 7 billion at a time when predicted global warming and overuse of natural resources in agriculture will make it difficult to grow enough food, even in many of the major food-producing regions, food security and safety are high on the global political agenda

The meeting will address a range of issues underlying food insecurity: biology, technology, ethics, social, economics, policy and health, and will offer opportunities for discussion, networking and collaboration.