2015

# BSCB Newsletter

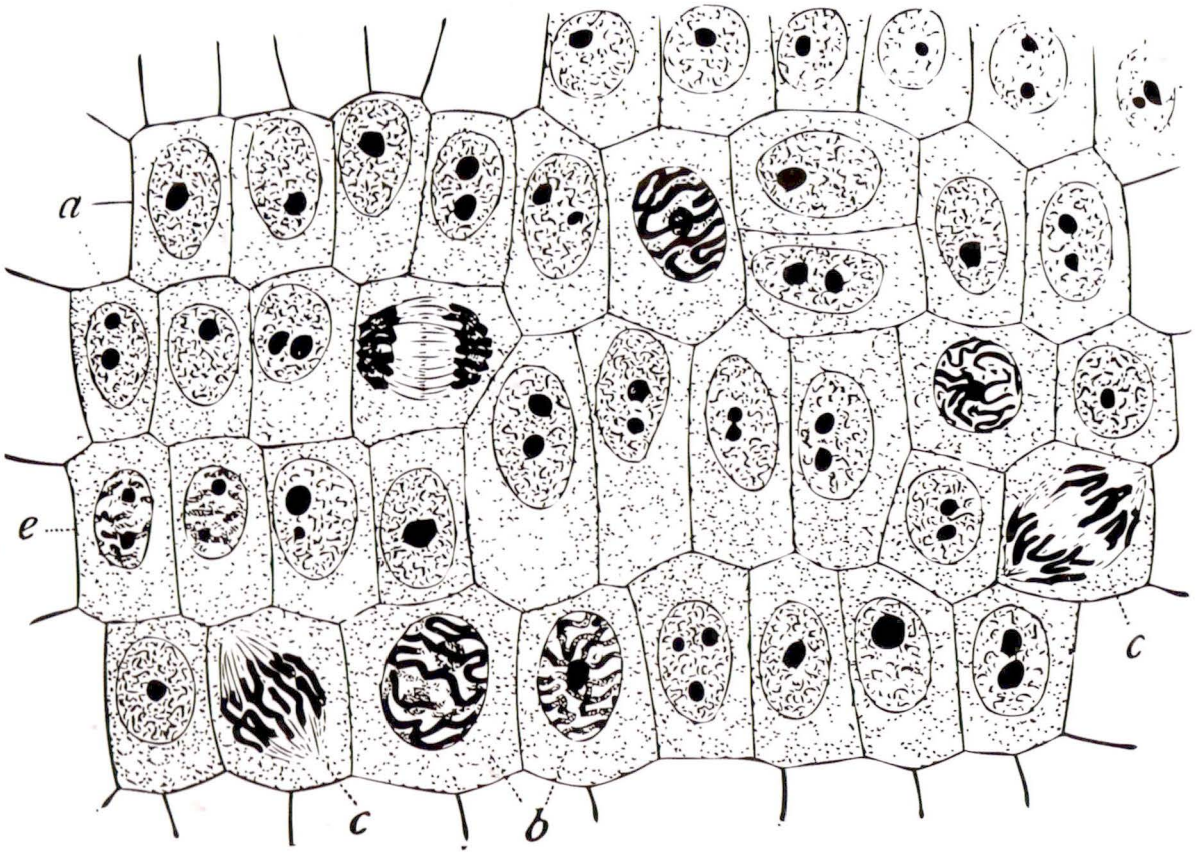
BRITISH SOCIETY FOR CELL BIOLOGY

## BSCB Hooke Medal 2015
## Women in Cell Biology Early Career Medal 2015
## Meeting reports

BSCB BSDB

# British Society for Developmental Biology & British Society for Cell Biology

Spring meeting




10th-13th April 2016
University of Warwick

#cbdb16

www.bscb-bsdb-meetings.co.uk

The Company of Biologists

# BSCB Newsletter 2015





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## Editorial

Welcome to the 2015 edition of the BSCB newsletter. This is my final issue as editor of the newsletter. I am stepping down after 4 years toiling at the keyboard. Unfortunately, my new job as head of Biochemistry at Bristol University has upped my workload and resulted in my tardy performance as newsletter editor and the failure to get together an edition last year. I can only apologise for this. Thankfully, a fresh, new newsletter editor has come forward and the next and subsequent issues will be edited by Dr Ann Wheeler (ann.wheeler@igmm.ed.ac.uk) who is head of the Advanced Light Microscopy and Super-resolution Microscopy facility at IGMM, University of Edinburgh. Ann is super enthusiastic and has an impressive eye for images and some great new ideas for taking the BSCB newsletter forward.

I hope you enjoy reading this edition of the newsletter. Inside there are the usual BSCB news and business items – the President's annual report, meeting reports from PhD students and postdocs who have received Honor Fell/Company of Biologists Travel Awards – as well as interviews with Kairbaan Hodivala-Dilke, the Hooke medal winner of 2015, and Victoria Cowling the 2015, and first, Women in Cell Biology Early Career Award medal winner.

Our stunning cover image is by Kif Liakath-Ali, University of Cambridge, who is the winner of the 2015 BSCB Image Competition. His image, which looks three-dimensional, shows green stained melanocytes of mouse skin in amongst hair follicles stained red.

Recently the BSCB has announced that the 2016 Hooke medal winner is Thomas Surrey and the winner of the 2016 WICB Early Career medal is Lidia Vasilieva. Both will present their winning lectures at the joint spring meeting of the BSCB and BSDB (10–13 April, University of Warwick), which is always a fabulous showcase of the latest cell and developmental biology. This year there will be plenary talks from Marc Kirschner and Ruth Lehman.

The committee hopes to see many of you at this meeting. Attendance by BSCB members has been relatively poor in recent years compared with that of members of our sister BSDB Society and we recently surveyed our membership to gather your views about our role in organising spring meetings. The survey was put together and the results collated by our postdoc rep, Alexis Barr. The results of this survey are published on the BSCB website.

That's all from me – all the best to Ann Wheeler in her new role as newsletter editor, and many personal thanks from me to Giles Newton (Wellcome Trust) who has worked with me on the production of the newsletter and will continue to work with Ann in the future. Please provide Ann with ideas (and even contributions) for future feature articles. All the best, Kate.


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Kif Liakath-Ali's winning image is of Melanocytes of mouse skin revealed by anti-TRP1 staining (Green) and individual hair follicles stained by anti-keratin14 (Red). Blue indicates DAPI staining of cell nuclei and autofluorescent hair shafts. Wholemount immunostaining was carried out on mouse tail epidermis.


**Newsletter editor:** Kate Nobes **Production:** Giles Newton **Website:** www.bscb.org **Printer:** Hobbs

# News

## We are golden: 50 years of the BSCB

1965: some have hailed it as the year Modern Britain was born. Winston Churchill and TS Eliot were buried and a new generation took over. It was also the year of the birth of a new kid on the society block – our very own British Society for Cell Biology.

You may ask why it took so long given that exactly three centuries earlier Robert Hooke discovered and named 'the cell' in Micrographia and over the intervening years seminal discoveries too numerous to mention were made – including the work of Schwann, Flemming, Golgi, Cahal and many others. After all, the Biochemical Society was formed in 1911 and the Society for Experimental Biology in 1923.

There was a huge boom in cell biology research in the 1950s, perhaps it was a golden age even. The ability to grow mammalian and even human cells in the lab took off (remember HeLa cells?) and developments in electron microscopy meant that the inner structures of cells could be investigated, if not fully understood. The *Journal of Biophysical and Biochemical Cytology* (later renamed the *Journal of Cell Biology*) was first published in 1955. Looking at the table of contents for that year makes interesting reading. In April that year, JCB published the translation of Walther Flemming's 1880 paper 'Contributions to the Knowledge of the Cell and its Vital Processes' with its beautiful hand drawn images of cell division.

The American Society for Cell Biology was formed in 1960 and the British Developmental Biology 'club' became a Society in 1964. Maybe these two events encouraged some of the British cell biology community to set up a new organisation, but unfortunately the circumstances surrounding the establishment of the British Society for Cell Biology are not currently known to the present committee, despite some enquiries. If there are any readers of this post who have inside knowledge, it would be great if you could get in touch so we can write something more detailed in the Newsletter and on the website. Equally if you have images or techniques from 1965 and can find modern day equivalents from 2015 we would love to hear your ideas for a series of Golden Anniversary posts.

The BSCB celebrated its 50th Birthday by launching a new medal recognising a female early career cell biologist (the WICB Medal). The first winner is Vicki Cowling.

## New COB/BSCB funds to support PIs with no independent grant funding

We are excited and very pleased to announce that the Company of Biologists have provided funds to allow the BSCB to support independent group leaders/PIs who currently have no independent grant funding to help cover the costs of travel to meetings, conferences, workshops, practical courses, PI laboratory management courses and courses to re-train.

Grants will be for up to £500 for travel within the UK, £1000 for Europe and £1500 for ROW.

Only current BSCB members are eligible and no awards will be made to lapsed members or those paying the incorrect subscription fee.

The purpose of the award must be clearly linked to Cell Biology (in the broadest sense) or professional development and should be justified in the application

Applications can be submitted at any time, but ahead of the event and leaving at least 2 weeks for processing and response

Applications are not competitive but will be processed in sequence of submission.

Application details can be found on the BSCB website at http://bscb.org/cob-support-grants/

When presenting a poster or talk, an acknowledgement should be displayed which can be downloaded from this website page.

# Women in Cell Biology Early Career Medal Winner: Victoria Cowling

The BSCB is delighted to announce the inaugural winner of the Women in Cell Biology Early Career Medal is Victoria Cowling.

Vicky is a Group Leader in the Medical Research Council Protein Phosphorylation and Ubiquitylation (MRC-PPU) Unit in the College of Life Sciences at the University of Dundee. Her group investigates how oncogenes and cellular signalling pathways influence the mRNA cap structure resulting in changes in gene expression and cellular physiology. The major contribution of Vicky's group is to uncover that the mRNA cap is dynamically regulated in the cell, integrating diverse signalling pathways to drive changes in protein synthesis and cell proliferation. Vicky's group are exploring the mRNA cap as a therapeutic target with which to inhibit cancer cell and parasite growth and proliferation.

Vicky did her PhD research at Cancer Research UK in London with Julian Downward and Gerard Evan and her postdoctoral research with Michael Cole at Princeton University and Dartmouth College, USA. She initiated her independent research group in 2007 at the University Dundee. Vicky was awarded a Lister Institute Prize Fellowship in 2011, an EMBO Young Investigator Award in 2013 and an MRC Senior Fellowship in 2014.

The WICB Early Career Medal has been established to mark the 50th anniversary of the founding of the BSCB. It will be an annual honour awarded to an outstanding female cell biologist who has started their own research group in the UK within the last seven years.

# Hooke Medal Winner 2015: Kairbaan Hodivala-Dilke

We are delighted to announce the winner of the 2015 Hooke Medal is Kairbaan Hodivala-Dilke.

After completing her PhD on the role of integrins in epithelial biology with Prof. Fiona Watt (Imperial Cancer Research Fund, 1990–1994), Kairbaan undertook her postdoctoral studies with Prof Richard Hynes (Massachusetts Institute of Technology, 1994–1999) and entered a Cancer Research UK Tenure Track position to build her own group (Mentor, Prof Ian Hart, Barts Cancer Institute, London). Amongst her achievements she was awarded tenure with Cancer Research UK (2004), appointed Professor of Angiogenesis (2009), and Deputy Director of the Barts Cancer Institute (2012).

Using state-of-the art transgenic technology in combination with cell and molecular biology, she has made international contributions to understanding the role of adhesion related molecules, including integrins and downstream signalling molecules, in tumour angiogenesis and cancer spread. Most recently, her laboratory has unveiled a novel feature of tumour blood vessels in angiocrine signalling, and the control of chemosensitisation controlled by endothelial focal adhesion kinase.

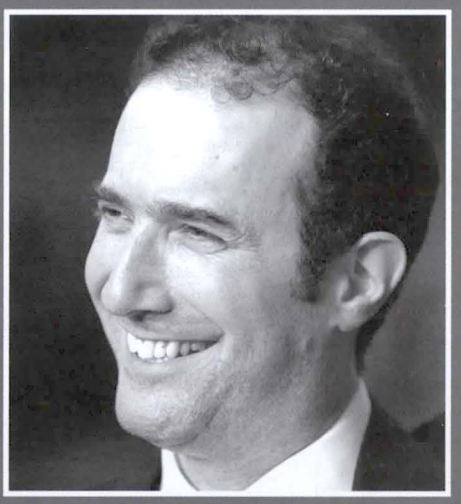
You can watch Kebs' wonderful lecture and hear how her early interest in art and music led her to her current position as Deputy Director at Bart's Cancer Institute on our YouTube Channel.

## What is the Hooke medal?

The Hooke Medal is awarded every year by the BSCB and recognises an emerging leader in cell biology. The award is named after Robert Hooke, the eminent 17th century natural philosopher and author of Micrographia (the world's first comprehensive illustrated book on microscopy) and is given to an individual who has made an outstanding contribution to UK Cell Biology – until we extended the period of eligibility in May 2014 this has usually been within the first 10 years of establishing their own lab. The medal is presented annually at the annual Spring Meeting after which the winner delivers their research talk.

From 2015, the Hooke Medal will be awarded to a cell biologist who started his or her own group within the last 14 years (with allowances for legitimate career breaks).

# BSCB President's report 2015



The BSCB's 50th birthday was celebrated in 2015, and I believe we are at an important crossroads. Societies like ours were founded to foster communication between scientists who share a common interest, and this was largely achieved through organising meetings and publishing journals. It seems worthwhile asking now whether, in the modern age of instant digital communication, this function is still relevant, and, if it is, how we can best deliver it. We love to hear your views and set up an Online Survey to canvass your opinions this year. The results are now published on the BSCB website. The BSCB exists for its members, and you have let us know how we can best serve you.

We would be particularly interested in hearing your views on BSCB's role in organising scientific meetings. We currently hold a large Spring Meeting every year, usually jointly with the British Society of Developmental Biology (BSDB), which covers a broad range of "hot" topics relevant to cell and developmental biologists. This meeting provides an excellent opportunity for networking and hearing about research that is outside your own areas of expertise – functions that are especially important for students and post-docs. Feedback, however, suggests that this meeting may be too broad and that group leaders may be reluctant to send their students and post-docs to a meeting that is not directly focused on their particular area of research. Personally, I think this is a pity, as I remember well the excitement I experienced as a graduate student at my first BSCB meeting, when Julian Blow told me over a beer that Cdc2, a key cell-cycle gene identified genetically in yeast, was a component of the mitosis-promoting-factor (MPF) that had been identified biochemically in frog eggs, which unified two major strands of cell-cycle research at the time. But perhaps I look at this through rose-tinted glasses. Let us know whether you think general meetings like this are useful anymore.

We also organise an annual Autumn meeting, but we are now planning to replace it with a variety of smaller meetings. For example, we co-organise with the Biochemical Society the very successful Dynamic Cell meeting every three years. We also plan to continue providing support to our members who organise smaller meetings on specific topics, such as the Actin Meeting, Microtubule Meeting and Membrane Trafficking Meeting. These meetings are usually short and inexpensive to attend, and they are very popular. Let us know whether you think these plans make sense.

You might have noticed that your Newsletter this year is very late. There are several reasons for this, but perhaps most pertinent is that our Newsletter Editor, Kate Nobes, was recently made Head of the Biochemistry Department in Bristol, which is a very big job. We congratulate Kate and thank her for all her work on the Newsletter and for keeping it going despite the demands of her new job. Understandably, she is now stepping down, and I am delighted to tell you that Dr Ann Wheeler, IGMM, University of Edinburgh, who recently joined the BSCB Committee will be the new Newsletter Editor.

More generally, I hope you will have seen the recent e-mail from the BSCB asking for members who might be interested in joining the Committee to come forward. We're particularly interested in members who might be interested in finance or who have good organizational skills, as our Treasurer, Caroline Austin, and our Secretary, Grant Wheeler, will be stepping down in 2017.

We're also interested in becoming more politically active, something that is going to be increasingly important in the coming years as Science budgets inevitably feel the squeeze of austerity. I am convinced that the BSCB could and should be a powerful voice for basic biomedical science. I've been involved with the BSCB Committee in various roles on and off for the last 15 years, and the Committee has always been a delightfully eclectic mix of dedicated volunteers who are great fun to work with. This is your Society, and you can help shape it by getting involved.

I realize that getting involved with the BSCB has sometimes not been easy this year, as we have had some problems with our membership processing systems. We recently asked Portland Customer Services (PCS) to run our membership database, which they did very effectively for a year, but it then went a bit pear-shaped. After difficult negotiations over the contract, they decided they didn't want to do it after all. We've now moved to HG3, who also helps us organise our meetings, so hopefully things will run more smoothly from now on (at the time of writing, we are still transitioning to the new system – so fingers crossed). Please let us know if you have any problems joining the Society or renewing your membership.

As always, I am extremely grateful to our colleagues who have done the hard work of organising our meetings. Adrian Harwood together with Andrew Chalmers and Lynda Erskine from BSDB organized the joint BSCB/BSDB Spring Meeting in Warwick in 2014, with a very little help from me, and Kate Nobes and Grant Wheeler from BSCB and Jo Begbie and Jenny Nichols from BSDB did so in 2015. Steve Royle and James Wakefield from BSCB and Jez Carlton and Uli Gruneberg from the Biochemistry Society organized the Dynamic Cell Meeting in Cambridge in 2014.

These meetings were all very successful, and the quality of the science was outstanding, as I am sure will be the case for the joint BSCB/BSDB Spring Meeting in Warwick in 2016, being organised by Silke Robatzek and Buzz Baum from the BSCB and Anna Philpott and Sally Lowell from the BSDB. These

meetings always make me feel that the BSCB is fulfilling its mission in supporting the UK cell biology community.

I want to welcome (in some cases somewhat belatedly!) Claire Mills, Julie Welburn and Judith Sleeman, who have joined the Committee and are already getting very involved. Claire is our student representative and has organized a very useful survey of our student members. Julie will be an organizer for our 2017 Spring meeting, and Judith has taken over the important role of Public Engagement and Website Co-ordinator from Paul Andrews.

I'd like to say an especially warm thanks to Paul, who is stepping down after more than seven years of dedicated service to the BSCB. He played a crucial part in bringing the BSCB into the 21st century: he reorganized our web-site, ran the picture and science writing prizes, and regularly kept our members updated on cell-biology-related topics via Facebook and Twitter. We will miss him greatly, and, for those of you who have become addicted to his dry sense of humour, I understand he will still be tweeting from @stemcellsuk (although no longer from @official_BSCB). I'd also like to thank Ana Pombo for her brief spell on the committee; her recent move to Berlin made it too difficult for her to continue, but we are very grateful for her efforts.

As always, I am very grateful to the Company of Biologists for its continuing financial support to the BSCB. They've recently undergone an impressive re-branding exercise, which hopefully will help make it a household name among life scientists in the UK and beyond.

And thanks to you, our members, for your continuing support. I look forward to seeing you in Warwick in 2016.

*Jordan Raff*

# Obituary: Professor Lorna Ann Casselton CBE FRS

## 1938–2014

It is with great sadness and regret that we announce the passing of Professor Lorna Casselton CBE FRS, Emeritus Professor of Fungal Genetics and Honorary Fellow of St Cross College at the University of Oxford. Professor Casselton died on 13 February 2014 at the age of 75, following a short illness.

After attending Southend High School for Girls, Professor Casselton started her academic career by reading Botany at University College London from where she went on to obtain her PhD in 1964. She then took up her first academic post as an Assistant Lecturer at Royal Holloway before moving to Queen Mary College, London where she was Professor of Genetics until 1991. Following this, Professor Casselton was appointed a Senior Research Fellow at the Department of Plant Sciences in Oxford and became Professor of Fungal Genetics there in 1997. She was a long term member of St Cross College at the University of Oxford, becoming a Fellow of the College in 1993, and latterly elected to an Honorary Fellowship upon retirement.

Professor Casselton was elected a Fellow of the Royal Society in 1999 and was appointed CBE in the 2012 Birthday Honours for services to fungal genetics and international science. As Foreign Secretary of the Royal Society from 2006-2011, Professor Casselton was a vibrant ambassador for British science, travelling the globe to promote science and assist with the establishment of scientific academies in a number of developing countries. In addition to her scientific ventures abroad, she greatly enjoyed travelling and experiencing the local culture in each country that she visited. Professor Casselton was elected an Honorary Member of the British Mycological Society in 2002 and was associated with many international mycological and fungal genetics societies. She was awarded honorary doctorates from Queen Mary, University of London in 2009 and from University College London in 2010.

Professor Casselton's pioneering research focused on sexual development in fungi. She was particularly distinguished for her genetic and molecular analysis of the mushroom *Coprinus cinereus*, for which she determined the genetic basis of mating by identifying the genes involved in fungi recognising mating partners. This had been a longstanding unsolved mystery of how fungi were able to recognise appropriate mating partners given the very large number of different sexes of fungi species. Her research ensured her status as one of the most important fungal biologists over several dacades.

On a personal level, Professor Casselton was a lively and enthusiastic scientist with charm and good humour, much admired by her peers and students alike. The many plaudits received since her death include being someone's "favourite scientist".

More detailed obituaries have been published in *The Times*, *The Telegraph*, *The Guardian* and *The Independent*, which are all available online.

The Lorna Casselton Memorial Fund has been set up by St Cross College at Oxford in memory of Professor Casselton in order to establish an annual lecture in Professor Casselton's name and a memorial scholarship for a graduate student in the biological sciences. The Lorna Casselton Memorial Lecture will bring an eminent scientist to Oxford each year to give a keynote address and present groundbreaking research in a biological area.

Full details of how to contribute to the Memorial Fund are available at:

www.stx.ox.ac.uk/lorna-casselton-memorial

# An interview with Kairbaan Hodivala-Dilke, BSCB Hooke medal winner 2015

*Kairbaan was interviewed by Alexis Barr, the BSCB postdoc rep.*

**Can you summarise what your lab works on?**

We work on tumour angiogenesis. We try to determine the molecular basis of how tumour blood vessels grow so that we might stop them growing or make them grow more.

**Make them grow more? Isn't that counterintuitive?**

Unfortunately, anti-angiogenic treatments can't be delivered as a monotherapy. They have to be given in combination with either chemotherapy or radiotherapy. However, chemotherapy can't be delivered to the tumour if there are no blood vessels. In addition, for chemo- and radiotherapy to be effective, they need a certain level of oxygen tension in the tumour. If we remove the blood vessels, the oxygen levels drop and sometimes this can cause a problem. That's not to say that anti-angiogenics couldn't be useful, but we need to be able to sustain their effect in patients and we need to learn more about how to do this effectively.

I have a long-standing interest in Integrin beta3 since I first worked on it during my postdoc. What we have found is that if we use a drug that targets beta3-integrin, at low doses it actually promotes angiogenesis specifically in the tumour. If we use this drug in combination with a second chemotherapy, for example gemcitabine, we can actually deliver more gemcitabine to the tumour and increase the oxygen tension in the tumour. This makes gemcitabine work better and can mean that we can reduce side effects.

**When did you first decide to pursue a career in science?**

It's quite a long story! When I was a kid I really enjoyed drawing, even more than reading. My Mum was an artist and she really taught me to look very carefully at things around us, like flowers and animals. It was while looking at these things in detail that I began to think, "why do the petals grow like that?" "Why does an ant have six legs?" etc. In addition, our neighbour, John Lagnado, worked at Royal Holloway and he used to travel to Africa and study parasites and I became very attracted to all of that. The reason I became interested in cancer research was when I was 15 or 16, our neighbour's mum had a brain tumour. Unfortunately she died leaving behind her husband

and three children. I remember thinking "that's not right".

Really it was my Mum, and Dad, who were so passionate about looking at things in detail and really learning through nature that inspired me.

**How did you get to where you are today?**

I did my PhD at the ICRF Lincoln's Inn Fields with Fiona Watt. Before my PhD I'd done an undergraduate degree in Biology at the University of Southampton and I really wasn't sure what I wanted to do after that. I knew I wanted to travel and I wanted a job that would pay me to go abroad. I applied for a tech job at Imperial to work on malaria and worked there for almost two years. After that, I travelled for six months in India with the money I had earned. I really enjoyed my tech job. It seemed more like play than work! I thought it was cool to be paid to play - and so I decided I needed to do a PhD.

In those days it was much easier to get a PhD position I think. I simply read the papers I liked and went to visit those labs. I've never really applied for a job my whole life – I've just kind of fallen into things. With Fiona I worked on integrins and the skin and I had a fantastic time. Towards the end of my PhD I wanted to go to a Keystone conference to learn how to ski. Fiona said she would only pay for me to go if I did some job interviews while I was in the States. I really didn't think I had a chance but thought "why not?" It was then I interviewed with Richard Hynes in Boston. I spent five years in his lab, even though I originally only went for one year but it kept getting extended. Richard's work was fantastic – he is one of the original discoverers of integrins and was making knockout mice for many of them. When he interviewed me they had knocked out all but one of the integrins – beta3-integrin – and he asked if I wanted to work on that one. So I did. Boston was a wonderful experience. I used to go into Richard's office, proudly, with piles of data, but I always came out with more than went in. He had a fantastic way of showing you the importance and value of our work and then adding more to it.

After Boston I came back to the UK. I came back to the ICRF on a tenure-track position, but this time at St Thomas' Hospital. Professor Ian Hart was my mentor there. After five years I was awarded tenure and, afterwards, Ian Hart moved the whole department to the Barts Cancer Institute, which is where we are now. Ian was a fantastic mentor and really showed me the way to think and run a lab, one small step at a time. He is still my mentor, teacher and friend and I hope he always will be.

**You mentioned it was easier when you applied for PhDs than it is now. What do you think the differences are between PhDs now and then?**

There was less competition then! Now, trying to get a PhD position is very competitive and I'm not sure it's for the right reasons. Curiosity-driven science does still exist but it's being given a hard time. When I applied it wasn't for the pay, it was more about interest, excitement and the potential for making discoveries. My grades weren't that brilliant, I was nothing special but I got offers. I worry about who will run labs in the future. Is there too much competition now? Postdocs are leaving science because there is no career in academia for them. The career structure is just awful. It needs to change.

**Why do you think more people are doing PhDs now?**

People seem to think that a degree is not enough. It really is enough. That is the wrong reason to do a PhD. I learned during my tech job that you have to be there to get things done. If you don't come in, things don't happen. You have to deliver. Of course qualifications matter, but experience will probably teach you more and give you the foundation for a better career.

The worst reasons to do a PhD are "I don't know what else to do", "I want to be called a doctor", "My mum told me to". A PhD is the most fun time of your career but also the hardest time as well. You're learning things at an incredible rate, there are many deadlines and there is a lot to deliver. You have to have a selfless passion. You have to get orgasmically excited about experiments. I'm not sure these huge interviews nowadays get at these deeper qualities.

**What do you look for when you're hiring people for your lab?**

Someone once told me that "you can teach anyone techniques but you can't teach enthusiasm". You can tell as soon as someone enters a room if they're enthusiastic.

For PhD students I always look for those who have a lot of lab experience and what their motivation is. If they say "because I want a career in research", I always ask "why?". Some can't answer that and those people aren't being honest with themselves about what they want.

For Postdocs I want them to have published during their PhD. I always ask Postdoc candidates to do a presentation. I don't care about how many hours someone works as long as they get things done. I aim to inspire people in my lab so that they are motivated to do more – I hope that I manage to do this, at least some of the time.

**Did you ever think you wouldn't make it to be a team leader?**

Constantly! I still don't think of myself as a team leader. During my interviews for my Postdoc position, one lab head in Boston asked what my ambition was for the next 10 years. I said I wanted to have children. He called Fiona Watt and told her that she had to sort me out!

I have been lucky I suppose, my career just unfolded in front of me. I had no ambition to be a lab head. I had no ambition to be Deputy Director of an Institute. I had no ambition to be a Professor. I've just done what was good for the science. I see my Deputy Director position as a form of community service. I've had so much help over the years that this is a way I can repay some of that help. Ambition was never my drive.

**What has been your most exciting moment in science?**

I've been lucky – I've had a lot. Not just once. There are many different forms of excitement. When I first started my lab we had real problems with Western blots. They were dirty and messy. I asked my first Postdoc if she could sort it out. I remember her coming into my office with a beautiful Western blot and thinking "we can do this". It was such a tiny, simple thing but so exciting. Then there are the big papers, opening the champagne after PhD vivas, when your junior postdocs give their first talk at a big conference, grants coming through, the ideas you have in the shower that you scribble down and they grow into discoveries. I can't do anything in the lab anymore except look down the microscope. And I still get excited - it's just beautiful. When lab members call me over to take a look at something I say to them "do you realise no one has ever seen this before?" It gives you a real buzz.

**What problems keep you awake at night?**

Funding. It's so competitive, which does makes sure that the best science gets funded (most of the time). I've now learnt how to write papers better and faster. I remember my Head of Department saying that your first paper is like "giving birth to an elephant". Which is true. But it does get easier.

I also think the career structure is flawed. A Postdoc is meant to be a stepping-stone. That means it has to lead onto something. I worry about Postdocs. There have to be more options. There needs to be a better career structure. There needs to be progression. It hasn't got any better over the years.

**If you could go back and change anything in your career, what would it be?**

Nothing – I've had an easy ride. I've loved it all – well at least the bits I can remember. I have two children and they say to me "why do you have to go in now? Why do you have to be late?" When my daughter was three or four she said to me "you love it don't you?" and I just said "yes. Yes I do". I don't think that they want to scientists, but they know that you can be passionate about your work and still be a good parent.

I definitely wouldn't change being a woman in science. One thing I have realised is that it's alright to do it your own way. Some women want to take three months maternity leave, others want to take a year. Some women want to work full-time, others part-time. Don't ask others for advice on how you should do it. Do it your way....as long as the work gets done....it's the best way. I have a very supportive husband and family and without that it would have been very hard – impossible probably.

When I was in Boston someone told me that my career was down the pan because I was married. I told them I thought I could manage a career in science and be married. I find that one of the biggest problems for women in science is women in science. This should be

our strength. A man never asks when he needs to leave early to pick the kids up, why do women? We just need to be calm, confident and get on with it.

**What do you enjoy least about your job?**

People who aren't willing to help themselves. I find it frustrating.

**How do you deal with disappointment? For example when grants don't come through or papers are rejected?**

I try not to take it personally. A lot of grants don't get funded just because there isn't enough money. Others don't get funded because someone hasn't read it properly or not understood it, you should try and not take it too personally. It will come through, you just have to keep going. It's much harder now than when I first started. Then, one in four grants were funded. Now it's 4%, 8%. And funding bodies are demanding a lot more. I think, I hope, that it can't get any worse than it is now. It's the same for papers. Do your best and then just keep going.

**Have you had an inspiring mentor during your career? How have they helped you?**

I've been fortunate to have mentors every step of the way. When I was a tech at Imperial I worked with a Postdoc called Pete Billingsley who was very inspiring. Then during my PhD, Fiona Watt was brilliant. She was on top of everyone's experiments and writing and thinking but could also chat about soaps that she'd watched on TV. During my Postdoc, Richard Hynes was a different kind of mentor. He had an amazing capacity to remember stuff. He would always say "give it a go", he was never negative.

Back at ICRF, Ian Hart taught me to understand the responsibility you have as a scientist to do something to make a difference. Whether it was working out a basic mechanism or finding a cure for cancer, the work has to be watertight and robust. You should be always trying to disprove your hypothesis.

I've had a lucky run of great mentors. Everyone has had something different to offer which has given me an amazing balance.

**What advice do you have for PhDs wanting to do Postdocs?**

The first question they should ask themselves is why do you want to do a Postdoc? Don't do a Postdoc just because you don't know what else to do. You have to realise that the lab head is looking for a set of skills. Those include technical skills but also papers from your PhD. Papers act as evidence that you can start and finish projects. I personally think that it is better to be first author on a small paper than third author on a big paper. And you have to have enthusiasm. In the most part, at least as the career structure is now, you need to have your future in sight... its not easy.

If people are applying to my lab – then why my lab? For example if you haven't worked in angiogenesis before then why now? You have to make a strong case to justify why you are applying to a certain lab. That will make you much more attractive to a lab head. You have to find the right project for you. Expand on where you have come from. You have to love what you're doing. You need to be self-motivated and run your own project. Do lots and lots of reading. Go to seminars. Even if they aren't in your area. You can't tell what you will learn in a seminar from the title. Even if it is a terrible seminar you will learn how not to give a seminar.

When going from a PhD to Postdoc if you can't hit the ground running, you will be slow in getting papers out. You need papers from your Postdoc if you want to be a lab head in academia or if you want to work in industry. You need papers to get grants. Its all about it being a stepping-stone.

Most importantly, make sure that you keep enjoying it. Be excited about it all. It's a privilege to be a scientist. To make discoveries. There's no other work that I can think of that beats it.

# BSCB Science Writing Prize 2015

*Ross Harper was the winner of the BSCB Science Writing Prize 2015. With an MA in natural sciences from the University of Cambridge, and an MRes in modelling biological complexity from University College London, Ross is now two years along a PhD in the chronobiology department at University College London. His research seeks to combine experimental and computational techniques in order to understand the differential processing of sensory modalities in circadian clocks. Outside of the lab, Ross edits 'science lifestyle' magazine Guru, and has experience running his own technology start-ups.*

## A Prescription for Antibiotic Resistance: A Rare Vantage Point in the Fight Against Bacteria

*Ross Harper*

We are at war. We have always been. Unfortunately, in this particular conflict we are outnumbered... seven hundred quintillion to one.

From the Black Death in the Middle Ages to the Victorian scourge of cholera, bacterial epidemics travel the globe, leaving devastation in their wake. Times were bleak in the nineteenth century; many battles were lost. And then, in 1928, humanity crafted a weapon. We stepped out of the darkness and into a new era: one of antibiotics. In a monumental stroke of luck, Alexander Fleming fell upon a fungus that produced a curious bacteria-killing substance. We now call it penicillin.

It's easy to dramatize the history of antibiotics. While we can't know exactly how many lives have been saved since their discovery, the figure is estimated to be in excess of 200 million. The world would certainly be a gloomier place without them, which begs the question: what will we do if they run out?

Earlier this year, researchers led by Kim Lewis at Northeastern University in Boston, Massachusetts, announced the discovery of teixobactin, a promising new antibiotic and the first of its kind for over thirty years. In studies in mice, teixobactin was shown to kill the infamous MRSA (methicillin-resistant Staphylococcus aureus) bacterium, as well as a host of other microbial nasties. Lewis and colleagues extracted bacterial cells

from soil and sorted them into individual chambers in a new device they call the 'iChip'. The iChip was then submerged back in the ground where essential nutrients could enter each of the chambers, allowing the bacteria to thrive. In this way, the researchers were able to culture strains that would normally be unwilling to adapt to life on a petri dish. Thus, like many of its predecessors, teixobactin is actually produced by one bacterial species in order to kill others. The enemy of my enemy is my friend – and in this case, our new friend is Eleftheria terrae.

Modern medicine can breathe a sigh of relief. The looming threat of a return to pre- antibiotic times has been pushed back into the shadows. However, now is not the time for complacency. The problem persists and is even on the rise.

"Antimicrobial resistance poses a catastrophic threat", says UK Chief Medical Officer, Dame Sally Davies, in her 2013 annual report. The issue remains integral to science policy, and it also highlights a key area of cell biology. Humanity is engaged in an ancient competition: big vs. small, eukaryote vs. prokaryote, us vs. them.

So from where does antibiotic resistance originate? Just as Fleming discovered, rather than invented penicillin, so too must we acknowledge that resistance is a naturally occurring phenomenon. Where there are chemicals that kill bacteria, evolution responds with immunity to them. Indeed, Darwinian natural selection is rarely illustrated so neatly. Once in a while, a random mutation in the bacterial genome will spontaneously generate a degree of resistance – for example, a change of just a few amino acids in the protein, beta-lactamase, can protect against penicillin. When penicillin is present, the mutant cell enjoys a competitive advantage over its peers, reproducing to a greater extent and spreading the mutated beta-lactamase gene throughout subsequent generations.

It's a profoundly troubling thought. Though we may take some comfort in our ability to understand the threat. After all, this process is consistent with everything we already know about evolution and gene transmission in a population, right? Well perhaps not. We typically only consider DNA to move in a vertical direction – parent to child, or in the case of a single cell, when it divides. However, many microbes are also able to move DNA and share useful genes horizontally between individuals. This horizontal gene transfer (HGT) helps bacteria acquire resistance far quicker than they would through conventional methods alone.

Mechanisms of HGT can be categorised into three main groups: transformation, transduction, and conjugation. Transformation is when a bacterium takes in DNA from its surrounding environment (perhaps left behind by a fallen comrade). Transduction, however, involves a viral middleman to transfer genetic information during infection. Conjugation embodies a more cooperative approach, where DNA is shared directly between two cells via the construction of a small bridge, or 'pillus'. While these are the tactics of our enemy, it is worth noting that research into HGT has been crucial to biotechnology. We can trick bacteria into taking up DNA fragments of our own design. In a satisfying twist of fate, the biosynthetic machinery of E. coli is commonly hijacked to produce proteins, such as insulin for the treatment of diabetes. This form of microbial slave labour has become a cornerstone of the pharmaceuticals industry.

Antibiotic resistance may not itself be a human creation, but we are certainly quite adept at accelerating its development. The sheer scale of antibiotic use in medicine, agriculture and waste disposal has seen the emergence of 'superbugs', such as MRSA, Clostridium difficile, and the unnervingly named, TDR-TB (totally drug- resistant tuberculosis). It's a textbook dilemma: antibiotics are the cause of, and solution to our problem. Prescription-only policies go some way to reducing widespread public health usage (particularly in the futile attempt to treat many viral infections), and there has been much discussion of 'cycling' front-line antibiotics to reduce environmental exposure to any one type. From a research perspective, current strategies explore ways to block the efflux systems that bacteria commonly use for resistance. Whereas a more conceptual approach might be to target only microbe pathogenicity, leaving the cell inert but otherwise able to reproduce, thus mitigating the selection pressure for resistance.

There are many ways in which we might seek to reduce the problem of antibiotic resistance; these are deserving of their own separate discussion. For now, the discovery of teixobactin serves as a welcome boost – a few more steps in the footrace against bacteria. Pursuit of iChip-like technologies, coupled with effective science policy, will keep us ahead of our competitor for a while longer. But, the race is relentless. The finish line, if it exists, remains out of sight.

# An interview with Victoria Cowling, Women in Cell Biology Early Career Medal winner 2015

*Victoria was interviewed by Clare Mills, the BSCB PhD student rep.*

**When did you first become interested in a career in science and becoming a team leader?**
Definitely at school. When I was about 13, I did some work experience at AstraZeneca which I really enjoyed. I loved the bench work and the translational aspect of the research. I'm not from an academic family, so I wasn't aware of what was out there. It was the people at AstraZeneca who introduced me to research and told me I needed to do this thing called a PhD. After that, I have always made the decisions about what to do next later, rather than earlier. I think you really need to enjoy the process at the time. You put a lot of pressure on yourself by saying you are going to be a group leader from the beginning.

**What are the main questions that your lab is focusing on?**
We investigate the regulation and function of the methyl cap. It is a structure found at the 5' end of transcripts and is crucial for the translation of mRNA to protein. It was discovered in the 1970s, but we have only recently shown that it is not just a housekeeping function. We have found it is crucial in controlling gene expression and can activate oncogenes. We are focusing on this function and how it can be used to develop new therapies – it is really important for me to be doing translational work.

**Your lab is part of the Division of Signal Transduction Therapy, how has this been?**
Yes, it is a collaboration between drug companies and

the University of Dundee. We have regular conversations with the drug companies which keep us focused on what is working and translational. We have also been working with the Drug Discovery Unit at Dundee on screens to target the enzymes that put the cap together. These have been really successful. With the Drug Discovery Unit we have been able to translate our work on cancer to trypanosomiasis, a sleeping sickness. To me, it is amazing how our research in cancer can be translated into tropical medicine.

**What is the most enjoyable thing about being a team leader?**

Having such a great team of people working for me. We can move at such a fast pace and we have had some great breakthroughs in the last five years. This is something I could never have done alone.

**...And the least?**

Dealing with the logistics of finance. I think I try and spread my budget over too many people; it's hard to keep on top of it.

**What is the biggest obstacle you have come across so far in your career?**

In science there are obstacles every day. Everyone gets grant and paper rejections, it's just something you have to get used to. I think it really helped that I decided to work in an area where no else was working at the time. On the one hand it is harder to publish something that no one is working on, but it meant I had time to develop my ideas properly.

**What are your thoughts on the obstacles that women face in science?**

Being part of Athena Swan, I have become aware of the statics on women in science. It is clear that we are losing a lot of women after the postdoctorate level. These women are very good scientists and it is such a shame to lose this expertise. We have a richer scientific environment with them. We know from our own stats at Dundee that it is because fewer women apply. I think they see it as difficult, it is very hard to take a lot of time off as a researcher, and child care is so expensive. I don't think female postdoctorates get enough encouragement. I was lucky that my supervisors always encouraged me and acted as though they assumed I would become a team leader. I don't think other people have that, and in general men get more encouragement.

Another problem I have come across is disapproval from other women for not spending a lot of time at home. Within five years of starting my lab I had two daughters. I went back to work very quickly after both my children were born, and people would express surprise and ask me "Who is looking after your children?" I think people assume that negativity about working women comes from 'bad people', but in my experience it is not like that all. People who are good friends or family can accidently discourage you. I'm certainly careful not to say anything negative, and I think it is really important that women support and encourage each other.

**How have you balanced work and family life?**

I've gone from spending 13 odd hours in the lab to working from 8 to 5, although this has actually been a good thing for my work. I can sit and really think about the lab's work as a whole in the evenings and not lose hours in the lab. I think this is harder to do as a postdoc or student as it is more important that you are in the lab. I think they do need much more support.

**Who in science inspires you?**

The people who really inspire me are the people my age or younger. Seeing people younger than I am in my lab balancing tough scientific problems and family life, their energy really motivates me. Working with people who, in my opinion, are better scientists than I was at their stage really inspires me and gives me great ideas.

**What is the best piece of scientific advice you yourself have ever received?**

My PhD supervisor Gerard Evan told me "Work on whatever you want to". I think it is really important to do what you think is worthwhile.

**What advice would you give to young postdocs and PhD students?**

There is a lot of blanket advice to give, but I think it is just really important to listen to yourself and do what you want to do. The variety in science is so great. You can travel, you can focus on doing lab work (my favourite aspect) or you can choose a field where you spend more time on theory. So I think it is really important to choose the aspect of science that you want to do.

**What's next for your lab and career?**

We have had such an exciting year – I'm really looking forward to publishing our discoveries from the last year. I thought the work on the methyl cap would be coming to an end soon, but we have recently switched from using established cell lines to primary cells and stem cells. The way the enzymes involved in the formation of the cap work in these cells is much more dynamic and really interesting, so we are going to be working more on that. I'm really looking forward to discussing this aspect with experts at the spring meeting! Our research with the Dundee Drug Discovery Unit will also be moving forward.

# Getting Authentic (Cell) Biology into Schools

*For the last 3 years, the Wellcome Trust has been funding a UK-wide scheme called "Authentic Biology". Its goal is to give 6th form A-level Biology students some exposure to real science, and to supplement the rather uninspiring curriculum work that schools are obliged to teach as exam preparation fodder.*

Authentic Biology was set up 6 years ago by Dr David Colthurst, a Science Teacher in Kent. His hope was to encourage real science in schools, to motivate science students and to increase the number of young people applying for science subjects at university. He began with his own school, Simon Langton Grammar School, and a link he already had with the University of Kent. He soon had an army of sixth formers running gels and doing PCR to investigate myelin sheath protein and its link to multiple sclerosis. This worked so well, and his students became so enthused, that he expanded the project and successfully procured further funding from the Wellcome Trust. This enabled him to invite 5 further schools – and this is where Cotham School and Bristol University joined in on the action.

In 2012, Paul Martin and Chrissy Hammond, who run zebrafish labs in Bristol Phys and Pharm and Biochemistry Schools, first proposed a project to Cotham's head of science, Andrew Ellis. The idea was to use zebrafish to investigate the cell biology of diseases including cancer, heart disease and osteoarthritis. They also teamed up with PIs from Social Medicine in their sister faculty in Medicine and Dentistry who run the renowned ALSPAC 'children of the 90s' programme and use genome-wide association studies (GWAS) to identify novel human disease genes. This collective of experts from the university gave the Biology students at Cotham the chance to be involved in novel, cutting-edge research, far beyond what might be achievable without the expertise of University Academics and the financial back up secured from the Trust.

The students are learning how GWAS can help them find new human disease genes; they are trained up on their own school computers to use ENSEMBL software to learn more about these genes and ZFIN to hunt down the zebrafish orthologues. They then order appropriate primers and use their own PCR machine to clone these genes and generate in situ probes and the like. And the students have been trained to observe the developing zebrafish embryo and larval stages to look at the potential 'disease gene' expression patterns.

More than 40 students have been committed to the project, and they have worked together to keep and maintain their own zebrafish in specially developed aquatic tanks from Tecniplast, which are a miniature model of the University of Bristol aquaria. The students have been busy developing their husbandry skills to optimise egg production in the hope that their happy fish will produce enough eggs on a regular basis to keep the project moving forward.

Each year the number of students joining this programme at Cotham has increased, as has their confidence and enthusiasm for real science. Last year, the 6th-formers had their own talk slot at a European zebrafish meeting in Bristol; they presented their findings back-to-back with some of the world's top zebrafish researchers. Derek Stemple from the Wellcome Trust Sanger Institute, who gave the plenary talk at the meeting, said "I was really impressed by the school kids and their understanding of both human genetics and zebrafish biology".

The school Biology Department has already witnessed a real enthusiasm and commitment from the students for keeping the zebrafish, and an appreciation for the importance of using model organisms in biomedical Rresearch. And it is not just good for the students. We have undergraduate project students choosing to do their projects as part a science project in the university, and part leading a group of students in Cotham school, and some of these undergraduates are now considering a career as science teachers.

# Meeting Reports

## 15th International *Xenopus* conference

24–28 August, 2014. Pacific Grove, Monterey, California.

**The 15th International Xenopus Conference was held in the seaside village of Pacific Grove (Monterey, CA). The excellent committee team, led by Carole LaBonne (Northwestern University) and John Wallingford (University of Texas at Austin) could not have picked a more picturesque site.**

As a first year PhD student studying under the supervision of Grant Wheeler (University of East Anglia, Norwich), I was apprehensive about travelling to the other side of the world to present my work to scientists, world leaders within my area of research, knowing no one. But how wrong could I have been? As soon as I arrived at the Asilomar conference grounds I was introduced to my three roommates, all of who quickly converted from roommates into good friends! I soon found that this inviting nature did not stop with the people I was sharing a room with. The *Xenopus* community as a whole welcomed me with open arms to join their network and for that I thank them.

As a whole, the conference was well organised with defined time slots which the presenters adhered to. A range of topics was covered throughout the four-day conference, which was arranged into themed sessions. The varied programme included presentations from first time attendees through to full veterans of the *Xenopus* community. The opening session (Sunday evening) was kicked off by Christof Niehrs (IMB, Germany) who covered his lab's recent and exciting work into the role of Wnt signalling in specifying ectodermal cell fate. Following on from this were presentations covering novel findings within areas of key developmental processes such as microtubule nucleation and mechanisms of pluripotency.

Monday's session hosted some excellent talks broken up by a presentation by the legendary John Gurdon (University of Cambridge). This day was of particular interest to me because it featured talks based upon novel research into neural crest development. First was Sofia Medina Ruiz from the Harland lab (University of California), focusing specifically on the migration of the crest and demonstrating some fantastic live imaging. The neural crest theme carried on throughout the duration of the conference with key speakers such as Karen Liu (King's College London) and Anne-Hélène Monsoro-Burq (Institut Curie, Université Paris Sud) demonstrating the great progress that *Xenopus* researchers have made in unravelling the secrets behind neural crest development.

Both Tuesday's and Wednesday's sessions featured a multitude of

presentations covering various topics, with one highlight for me being Amanda Dickinson's (Virginia Commonwealth University) talk on 'using frog faces to better understand orofacial development'. Amanda presented her lab's novel findings elaborating on the cutting edge technology they have been using to understand facial clefting. She presented her data in a captivating and engaging manner and it was a thoroughly enjoyable talk. Later on during the day on Tuesday, a 'new PI meeting' was put in place, enabling the students and postdocs to go and enjoy some free time, or in my case to go and enjoy whale watching off the coast of Monterey Bay (and not forgetting the worlds best ice cream on Fisherman's wharf)!

Wednesday afternoon also presented us with some free time to break up the sessions and I attended my very first surfing lesson on the famous Carmel beach – an experience I will never forget! Both Tuesday and Wednesday nights were occupied by poster sessions. My poster, presented on the first night, was titled 'the role of miRNAs in Neural Crest Development.' Despite losing my voice the next day as a consequence of four hours of 'presenting', I gained some invaluable feedback.

Thursday morning began with a talk by Ken Cho (University of California, Irvine) focusing on the multiple approaches his lab are taking into elucidating the formation of endoderm tissue. To close the conference, the award ceremony began with Katherine Pfister, based in the Keller lab (University of Virginia), taking the limelight, and quite rightly so. Not only did she win a prize for her poster describing the role of myosin light chain during convergence and extension but she also won not one but both of the student question prizes. These well-earned prizes were a consequence of her enthusiasm and ability to ask a variety of thoughtful questions covering topics varying from areas within her field of study (actin polymerisation) to those not (X-ray phase contrast microtomography).

Overall, the 15th International *Xenopus* Conference proved to be an excellent meeting that provided new researchers (like myself) with an invaluable learning experience (in more than one way) while ensuring that established staff had abundant material to keep their knowledge up to date. In addition, the welcoming nature of the *Xenopus* community as a whole, alongside the well organised social events, offered the opportunity to discuss work outside the usual sessions as well as facilitating the formation of both useful contacts and good friends. I would like to thank the BSCB for their generous grant, which made this trip possible.

*Nicola Ward,*
*University of East Anglia*

# Joint conference of the British Society for Cell Biology and the Biochemical Society: The Dynamic Cell

4–7 September, 2014. Robinson College, Cambridge, UK

**The joint conference of the British Society for Cell Biology (BSCB) and the Biochemical Society was organised by Jeremy Carlton (King's College London), Ulrike Gruneberg (University of Oxford), Stephen Royle (University of Warwick) and James Wakefield (University of Exeter) at the Robinson College in Cambridge.**

Robinson College is one of the newer colleges and is in a very good location, close to the city centre of this beautiful historical city. I live in Cambridge and so I had the opportunity to participate to this very interesting meeting without disrupting my family life. The meeting lasted for three full days; it was very well organised with distinct, but interrelated sessions: "Molecular control of chromosome segregation", "Cargo sorting in the endocytic and secretory pathways", "In-Vitro analysis of molecular motors", "Membrane dynamics during cytokinesis" and "Cell migration and the cytoskeleton". I enjoyed most of the talks and they were very informative.

In the first afternoon of the meeting in the "Molecular control of chromosome segregation" session, Claire Walczak (Indiana University, U.S.A) gave an interesting talk. For many years she has been working on mitotic spindle assembly and her talk focused on how the protein XCTK2, the human Kinesin-14 HSET, is regulated by the small Ran GTPase. Using FRAP analysis of wild type and various mutant version of GFP::XCTK2, Walczak's group observed that XCTK2 turnover was different in distinct regions of the spindle in Xenopus. XCTK2 distribution was regulated by the Ran gradient within the spindle. Her conclusion pointed out that XCTK2 is not only an important kinesin for spindle assembly, but is also a key Ran-regulated factor whose activity is temporally and spatially controlled within the spindle.

In the same session, Susanne Lens (Utrecht University, The Netherlands). She presented her work on how the function of the Chromosomal Passenger Complex (CPC) is perturbed in some cancers. The CPC consists of Aurora B kinase, its activating protein INCENP, Survivin and Borealin. This important complex monitors the proper execution of the chromosome segregation event in cell division to ensure genome stability. Using mostly gene expression microarray datasets and by looking for abnormal expression of CPC components, regulators and substrates, they identified Shugoshin-1 (Sgo1) as a possible cause for CPC deregulation in some types of cancer. Sgo1 can recruit a phosphatase that counteracts the activity of Aurora B kinase on different substrates. When Sgo1 is over-expressed, the balance between phosphorylation and dephosphorylation at kinethochore-microtubule attachment sites is altered, giving rise to the mitotic defects observed in cancer cells.

Michelle Peckham (University of Leeds) presented evidence that a new stable single alpha helical domain (SAH), initially found on different myosin proteins, works as a spring-like element between the motor and the tail. Using atomic force microscopy (AFM) and other techniques, they showed that SAH domains unfold at relatively low forces and have a high propensity to refold. These properties prevent the motor from becoming detached from its track, and enable it to carry cargoes in the dense actin meshwork. Interestingly, this type of protein structure has been found in other types of proteins with different function including INCENP, a component of the CPC complex as previously mentioned.

Susana Godinho (Barts Cancer Institute, London) described how the presence of multiple extra centrosomes confers advantageous characteristics to cancer cells. The centrosome is an important organelle in many animal cell types, with a crucial role in controlling the nucleation and organisation of the microtubule network. Using an intriguing three-dimensional model system and other approaches to culture human mammary epithelial cells, they observed that centrosome amplification triggers cell invasion. This can promote aggressive cancer cell invasion resembling the one induced by over-expression of the breast cancer oncogene ErbB2. Increased centrosomal microtubule nucleation promotes Rac1 GTPase activity, which in turn disrupts normal cell-cell adhesion and promotes invasion in human cancer.

Francis Barr's (University of Oxford) talk was the first of my favourite session "Membrane dynamics during cytokinesis". He discussed the initial events of cytokinesis involving the assembly and formation of an array of antiparallel overlapping microtubule called the 'central spindle', an key molecular structure for the ingression of the furrow that bisects the dividing cell.

I also enjoyed the BSCB plenary lecture from James Spudich (Stanford University School of Medicine, USA) on the "The myosin family of molecular motor: nature's exquisite nanomachines" and other distinguished lectures by many awards recipients. All these lectures presented a very interesting and global analysis of their specific topics.

During the conference, we had two poster sessions and I could mingle with other delegates and present my work, receiving good

feedback at my research poster. The small number of participants created a very good atmosphere and fostered interesting discussions during and after the talks. On a couple of occasions after the talks, animated discussions arose between the speaker and the audience; this was very motivating for me because all of us could participate to discuss important issues in the field. I also found very useful to have all the talks and poster abstracts available before the meeting on the BSCB website so that I could plan beforehand which talks and posters to visit.

Overall, the meeting presented a very good line-up of speakers and although I could not mention all the talks, they were all highly informative and highlighted the strong correlation between membrane trafficking and cell division. I am very grateful to the BSCB for providing me with the Honor Fellow Travel Award that covered the expenses for my attendance to this exciting BSCB and Biochemical Society meeting in Cambridge.

*Luisa Capalbo*
*University of Cambridge*

# Centrosomes and Spindle Pole Bodies

## 30 September – 3 October 2014; Lisbon, Portugal

**The 3rd EMBO conference on Centrosomes and Spindle Pole Bodies took place in Lisbon, the beautiful, historical capital of Portugal. Held every three years, the organizers, Monica Bettencourt-Dias (IGC, Portugal), Pierre Gönczy (EPFL, Switzerland), Wallace Marshall (UCSF, USA) and Susana Godinho (BCI, London), did a fantastic job of bringing together the leading names of the field to present their latest exciting research, which fostered a vibrant and dynamic conference.**

With registration commencing late on the first afternoon, the contingent from NUI Galway took opportunity to partake in typical tourist activities to get a feel for the city before the serious side of our trip to Lisbon started. After a morning seeing the sights in glorious sunshine, we headed to the conference venue to pick up our registration packs, which, in addition to the usual conference paraphernalia, contained the gift of a mug strikingly depicting Drosophila mitosis on its surface.

The conference itself was launched with an introductory centrosome talk by Michel Bornens (Institute Curie, France) which kick-started the first session on Centrosome Structure and Composition. The first few talks focused on aspects of centrosomal function and assembly. David Agard (UCSF, USA) presented data showing that the ring complex formed by yeast TuSCs, the structure responsible for microtubule nucleation, matches the thirteen-fold microtubule symmetry, thereby functioning as a microtubule template. Michel Steinmetz (PSI, Switzerland) and Gang Dong (Medical University of Vienna) discussed the earliest steps in centriole formation, namely the definition of cartwheel symmetry by SAS6 and centriolar docking of Plk4, respectively. The last talk of the day was given by Ciaran Morrison (Centre for Chromosome Biology, Ireland), who described the pericentriolar material as a hub for DNA damage response checkpoints and in particular its role in the activation of nuclear CHK1. The day was superbly rounded off with a reception featuring copious amounts of Portuguese wine and cheese, which ably facilitated in-depth discussion between old and new friends alike.

The next day, the second session, on Centrosome Biogenesis, was chaired by Jordan Raff (Oxford, UK), who presented work from his group describing a simple mechanism by which flies assemble pericentriolar material in mitosis. In his model, Asl is recruited to new centrioles by Sas-4, in turn recruiting DSpd-2 and Cnn which form a scaffold-like structure that emanates away from the mother centriole. The session continued with talks from Pierre Gönczy (EPFL, Switzerland) on centriole inheritance in *C. elegans*, Chad Pearson (University of Colorado) on the regulation of centriole duplication by a short isoform of CEP135 and Monica Bettencourt-Dias (IGC, Portugal) on the requirement of centrosomes to activate PLK4 by providing a means to concentrate the kinase. The morning concluded with a talk from Jadranka Loncarek (Center for Cancer Research, NIH) on Plk1-driven centriole maturation as seen by appendage protein assembly.

The first poster session commenced after lunch, during which I presented my poster on 'Induced ciliation in lymphocytes reveals a

role for centrin in ciliogenesis'. After a busy couple of hours, the Centrosome Biogenesis session was completed with talks from Tim Stearns (Stanford University) on the tubulin family member Eta, Jay Gopalakrishnan (University of Cologne) on the regulation of cilium disassembly by CPAP and Ingrid Hoffman (DKFZ, Heidelberg) on novel PLK4 interacting proteins.

The third session, on Diverse Microtubule Organizing Centers and Evolution, chaired by Juliette Azimzadeh (Institut Jacques Monod, France), reminded those of us who work predominantly in human cells what can be learnt from a diverse range of lower organisms. Iain Hagan (CRUK, Manchester) and Anne Paoletti (Institut Curie, France) presented data from yeast on the control of mitotic progression and spindle pole body duplication, respectively; whilst Asako Sugimoto (Tohoku University, Japan), Jose Pereira-Leal (IGC, Portugal) and Elmar Schiebel (ZMBH, Heidelberg) discussed the evolution and conservation of microtubule nucleation. The session concluded the following day with Wallace Marshall (UCSF) introducing us to the intriguing organism *Stentor coeruleus*, a giant single celled ciliate that develops complex patterns akin to embryos. His current work is focused on how centrioles contribute to this pattern formation.

The next session, Development and Disease, was chaired by Fanni Gergely (Cambridge) who presented work from her group on the use of genome editing to generate a range of cell lines that lack intact centrioles. They found pericentriolar material components could accumulate to different extents in the absence of centrioles, but the cells displayed a diverse range of defects including reduced proliferation and delays in spindle assembly. The next talk was presented by Andrew Jackson (MRC HGU, Edinburgh) who described the role of the centrosome in microcephaly, a condition in which brain volume in reduced to a third of normal. The session continued with talks from Cayetano Gonzalez (IRB, Barcelona) on Centrobin function in terminal differentiation, Renata Basto (Institut Curie, France) on centrosome inactivation in epithelial cells, Susana Godinho (BCI, London) on oncogene-like induction of cellular invasion from centrosome amplification, and Travis Stracker (IRB, Barcelona) on CEP63 deficiency promoting p53-dependent microcephaly.

The day concluded with three talks from the fifth session on Cell Division, which was chaired by Andrew Holland (John Hopkins, Baltimore). These were given by Isabelle Vernos (ICREA, Barcelona) who described the mechanism of microtubule nucleation during mitosis, Patrick Meraldi (University of Geneva) who talked about the control of spindle asymmetry, and Nicholas Taulet (CRBM-CNRS, France) who discussed the role of intraflagellar transport proteins in microtubule cluster transport and chromosome congression during mitosis.

An early finish to the day was necessary, as a conference dinner and boat trip had been organized for the evening. Buses took us through Lisbon to our boat, which was moored on the river Tejo, where we were greeted with a port and wine reception and a fabulous view of the city during sunset. Before sitting down to dinner the winners of the poster prizes were announced, and to my great surprise my name was read out.

The next day we were back to business with the continuation of the Cell Division session and a number of talks focusing on spindle assembly from Anthony Hyman (Max Planck), Heidi Hehnly (University of Massachusetts Medical School), Justin Decarreau (University of Washington) and Jens Lüders (IRB, Barcelona).

The sixth, and final session on Cilia and Trafficking was chaired by John Wallingford (University of Texas, Austin), who presented work on a novel human ciliopathy protein that serves as a scaffold for the recruitment of planar cell polarity effector and intraflagellar transport proteins to basal bodies. Manuel Théry (CEA, France) introduced us to the centrosome as an actin-organizing center, through the ability of isolated centrosomes to assemble and anchor actin filaments. Alex Dammerman (Max F. Perutz, Vienna) described distinct roles for basal body and transition zone proteins in *C. elegans* cilia assembly and function, whilst Susan Dutcher (Washington University) presented the assembly of the ciliary gate in Chlamydomonas. The last talk before lunch was given by Laurence Pelletier (Lunenfeld-Tanenbaum Research Institue, Toronto), who described an extensive proximity map at the centriole-cilia interface that his group has deciphered using BioID based proximity-dependent biotinylation. This has unveiled a huge number of exciting hits that will greatly enhance the understanding of how centrioles function as the template for cilia formation.

The session was completed with talks from Jane Stinchcombe (Cambridge) on centrosome docking at the immune synapse, Lukas Cajanek (University of Basel) on the role of the TTBK2-Cep164 complex in ciliogenesis and Jennifer Vieillard (CGphiMC, France) on *Drosophila* spermatogenesis as a novel system to study the ciliary transition zone. The conference itself was concluded with a general discussion on the location and direction of future meetings.

I would like to thank the BSCB for their generous Honor Fell Travel Award which enabled me to attend this meeting.

*Suzanna Prosser*
*Centre for Chromosome Biology*
*National University of Ireland Galway*

# Gordon Research Conference: Neurotrophic factors

31 May – 5 June 2015. Newport, USA

**Situated amongst white sandy beaches and seaside cliffs, the picturesque campus of Salve Regina University in Rhode Island, USA, was the perfect setting for this international conference on neurotrophic factors.**

The meeting, organised by Freda Miller and Wilma Friedman, had a translational theme and brought together scientists whose primary interests were basic biology of neurotrophic factors as well as those interested in therapeutically-oriented aspects. Over four days, the meeting explored how neurotrophic factors shape the nervous system and their involvement in producing and maintaining disease states and how this might be exploited therapeutically.

The meeting started with an evening session on growth factors and stem cell biology and included an inspiring talk by Clifford Woolf (Harvard University, USA) whose recent work has identified five transcription factors that are capable of transforming mouse fibroblasts into nociceptive neurons. These were found to have similar characteristics to that of adult mice-derived nociceptors and, interestingly, the group showed that a similar process was also applicable to humans. By transforming fibroblasts of patients with familial dysautonomia, they demonstrated that this phenotype can be replicated *in vitro*. Translating this new technique to the clinical sphere is an exciting development which has the potential of using human neurons to study human disease states.

Throughout the meeting, there was a lot of focus on retrograde signalling of neurotrophins and their receptors. For example, Rosalind Segal's (Dana-Farber Cancer Institute, USA) talk was on retrograde response genes such as Bclw, which has a specialised role in axonal survival signalling. Such genes are regulated only when receptors on distal axons are stimulated by neurotrophins and not when receptors on the cell soma are stimulated. Christopher Deppmann's (University of Virginia, USA) talk explained how NGF-induced coronin-1 expression at signalling endosomes is crucial for proper circuit formation of the sympathetic nervous system.

Monday started early with a session based upon neurotrophic factor signalling. One of the talks that particularly grabbed my attention was by Barbara Hempstead (Weill Cornel Medical School, USA) on a common polymorphism Val66Met in the prodomain of brain derived neurotrophic factor (BDNF), which is associated with an enhanced risk of developing depression and anxiety. Structural studies have shown that two prodomains adopted distinct conformations and that Met66 exerted its effect through growth cone retraction. Other talks in this session included the function of *Drosophila* neurotrophins and their receptors in regulation of neuronal cell number and synaptogenesis (Alicia Hidalgo, University of Birmingham) as well as the structural biology of death domain signalling of the p75 receptor (Carlos Ibáñez, Karolinska Institute, Sweden).

Tuesday's talks were more focussed on the role of neurotrophic factors in the nervous system. Michael Greenberg gave a talk on MeCP2 which can act a transcriptional repressor. MeCP2 phosphorylation and activation *in vivo* is required for proper synapse development and behaviour. MeCP2 mutations, which cause Rett Syndrome, abolish interaction with the NcoR/SMRT corepressor complex, with particular disruption of long gene expression in the brain. Other

talks included those by Beatriz Rico (Kings College London) on the identification and role of the neuregulin-1-ErbB4 signalling pathway in the control of inhibitory circuitry and by Claudia Bagni (University of Rome Tor Vergata, Italy) on the translation role of fragile X mental retardation protein on the positioning of cortical neurons during development The poster session of the first two days covered a whole range of topics on all the different neurotrophic factors and their receptors was a great opportunity to talk to fellow students and researchers and broaden my own knowledge of neurotrophins.

Wednesday's talks were of more interest to me as they were on neurotrophic factors in disease and repair. David Shelton (Rinat Laboratories, Pfizer, USA) gave a talk on the development of anti-NGF therapy as a treatment for chronic pain. At present, the mainstay of treatment for chronic pain are NSAIDs and opiates, both of which have significant side effects and decreased efficacy with long term usage. There is a real need for the development of better analgaesics. Tanezumab is a humanised monoclonal antibody selective for NGF. In a clinical trial of patients with chronic back pain and osteoarthritis, which is ongoing, this shows more efficacy than naproxen. Other talks in this session included those by Frank Longo (Stanford University School of Medicine, USA) on developing small molecules for targeting p75 for neurological disorders such as Alzheimer's disease and by Michael Sendtner (University of Wuerzburg, Germany) on the role of IGFBP5 on inhibiting motor neuron growth and survival.

No meeting at Rhode Island would be complete without a sea excursion and, after an afternoon of sailing, the meeting resumed with a poster session in which I presented my poster titled "Functional analysis of NTRK1 missense mutations causing hereditary sensory and autonomic neuropathy type IV". This sparked a lot of interest particularly because this disease results in a congenital insensitivity to pain and highlights the complexity of TrkA signalling and how perturbation of just one aspect of signalling is sufficient to disrupt nociceptive neuronal development. I was pleased to be able to discuss my work with different researchers and explore different ideas for taking things further.

The last day of the conference centred around the theme of neurotrophins and development. Patrik Ernfors (Karolinksa Institute, Sweden) gave a talk on the origin and diversification of cell types within the peripheral nervous system. They extensively analysed the transcriptome of 622 single mice neurons which allowed classification into eleven distinct subsets of sensory neurons. These results identified specific markers for new functionally distinct subtypes. Other speakers included Alun Davies (Cardiff University) on the effect of autocrine signalling on tissue innervation and David Ginty (Harvard University, USA) on the development and function of low threshold mechanoreceptors of the skin. The afternoon session was on axon degeneration and regeneration and included talks on the mechanisms of axon regeneration in *C. elegans* by Marc Hammarlund (Yale University, USA).

The conference concluded with a spectacular closing dinner with lobsters that Rhode Island is famous for. I learnt a lot from the different talks and the opportunity to present and discuss my own work was extremely helpful. I would like to thank BSCB for their generous support in presenting me with the Honor Fell award which allowed me to attend this conference.

*Samiha Shaikh*
*Cambridge Institute for Medical Research,*
*University of Cambridge*

# The 9th European Zebrafish Meeting,

## 28 June – 2 July 2015. Oslo.

**The beautiful Norwegian city of Oslo was host to the 9th European Zebrafish Meeting. I was looking forward to this meeting as it was one of the larger meetings for the zebrafish community. I had been to the previous European zebrafish meeting in Barcelona, an excellent conference which left me with high hopes this meeting. It did not disappoint.**

The first day of the conference was dedicated to the topic of new technologies. There were many talks scheduled for this day but as I scanned through the program it was clear to see that one particular technology was at the forefront of the zebrafish community's mind – the CRISPR/Cas9 genome editing tool. This tool seems to have surpassed the use of Z-Finger Nucleases and TALENS (Transcription Activator-Like Effector Nucleases) as the genome editing tool of choice for the zebrafish community, as was demonstrated by the number of presentations throughout the meeting that contained CRISPR-generated mutant fish.

Many of the talks covered the practicalities of using CRISPR/Cas9 system. For example, Antonio Giraldez presented an algorithm called CRISPRscan (CRISPRscan.org) which can help researchers to design the most active and effective gRNAs for their research. The afternoon talks were concerned with the application of the CRISPR/Cas9 system. Flavia De Santis presented a GAL4 UAS system to drive Cas9, to confine genome editing to specific cells or tissues, while Christian Mosimann has used a Cas9 protein linked to GFP to

identify, by fluorescence, which particular cells were expressing Cas9. This identifies which cells have the higher likelihood of having a mutation. Jeroen Bakkers described a technology that I though was very useful. His technique combines the spatial resolution of *in situ* hybridisation with the ability to quantify the changes in RNA expression provided by RNA sequencing. This allows the researcher to analyse the change in RNA expression and localisation between experimental conditions.

The second day looked at zebrafish as a model for disease, and as a for the identification of therapeutics for these diseases. Highlights include the Leonard Zon's talk about chemicals such as 16, 16-dimethyl-PGE2 (dmPGE2) that can increase the numbers of hematopoietic stem cells; these their clinical utility was shown first in zebrafish, and they are now are undergoing clinical trials.

The third day covered migration and development and the sessions covered an array of research areas. Mary C. Mullins showed that the polarization of the zebrafish oocyte was coupled to the meiotic chromosomal bouquet configuration. This is interesting as, previously, the earliest indication of the oocyte polarization was the Balbianni Body formation. The meiotic chromosomal bouquet configuration precedes Balbianni Body formation, and so indication of the polarization of the oocyte can be identified earlier.

Carole Gauron demonstrated the use of HyPer Probe, a fluorescent sensor to detect hydrogen peroxide ($H_2O_2$), in the study of axon path finding. She showed that axons used H2O2 levels to guide them to their destination. Furthermore, it was shown that, in adult zebrafish, $H_2O_2$ levels are decreased – so adult zebrafish don't regenerate their axons as well as younger zebrafish. From this session, the talk that was most related to my research in the musculoskeletal field was given by Gage Crump. He showed that one of the earliest joints to develop in the zebrafish: the jaw joint, resembles a synovial joint by 21 days post fertilisation. This lends more support to the usefulness of zebrafish as an animal model to study the musculoskeletal system.

*Scott Reynolds*
*University of Bristol*

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# EMBO Meiosis Conference 2015

30 August – 4 September 2015. St. Catherine's College, Oxford.

**This meeting alternates with the Gordon Conference on Meiosis in the USA, which I attended last year, so it was great to see the progress of research reported on by the large US-based community present in Oxford.**

The meeting kicked off with a session on the timing of the meiotic cell cycle and how the microtubule spindle is assembled in order to facilitate chromosome segregation. The first speaker was Melina Schuh from the MRC-LMB in Cambridge. She presented the first comprehensive analysis of live spindle assembly in human oocytes, in collaboration with the Bourn Hall Clinic in Cambridge. It is known

that human eggs are particularly error-prone in distributing the genetic material in the meiotic divisions. The human meiotic spindle takes very long to assemble, compared to the better-known mouse oocyte model, and displays high instability with an assembly-mechanism based on chromatin and not via microtubule-organizing centers. Segregation errors result, and these observations contribute to our understanding of the faulty nature of human meiosis. Next, Iva Toli from the Ruder Boškovi Institute in Zagreb, Croatia, presented her ongoing work on the pivoting mechanism microtubules that employ for chromosome capturing in fission yeast, and how the homologous chromosomes behave in meiosis to contribute to the efficiency of this process.

The following morning, Kim McKim from the Waksman Institute/Rutgers University at New Jersey, US, added his group's findings to the discussion of how microtubules interact with the kinetochore structure on the chromosomes in *Drosophila* oocytes. Thus, it was very interesting to see the similarities and differences the model organisms use to ensure proper spindle assembly and chromosome segregation.

For a temporal view on how mammalian oocytes go through the first division, Suzanne Madgwick from Newcastle University presented a model on how the cell cycle may account for the rather complex first division by timing or delaying it through separate destruction mechanisms of the main factors regulating cell cycle progression. Mary Herbert, also from Newcastle University, focused on the pathways that protects the premature segregation of chromosomes and to what extent failures in the protection mechanism through protein loss could explain the increased incidence of non-equal chromosome segregation in women over the age of 35. Contributing to the meeting as one of the 'locals', Martin Houlard from Kim Nasmyth's Lab of the University of Oxford showed his beautiful live-imaging data on mice oocytes lacking the condensin complex. This complex is essential to hold chromatin together to withstand mechanical forces exerted on chromosomes during cell division.

Both Monday and Tuesday afternoon saw extensive poster sessions, which were continued after dinner on both nights, with an additional last session on Wednesday night. It was great to see the diversity of model organisms used for research on meiosis, from barley to human, from nematodes to tomatoes, and how the conserved features in each system can help us to a unified picture of mechanisms in meiotic maturation, and where the peculiarities of each organism lie. To accommodate for the more than 140 posters, the session was divided into three rooms, which was good to avoid large numbers of people in the rows of posters and kept the noise levels low, which can be a problem at meetings.

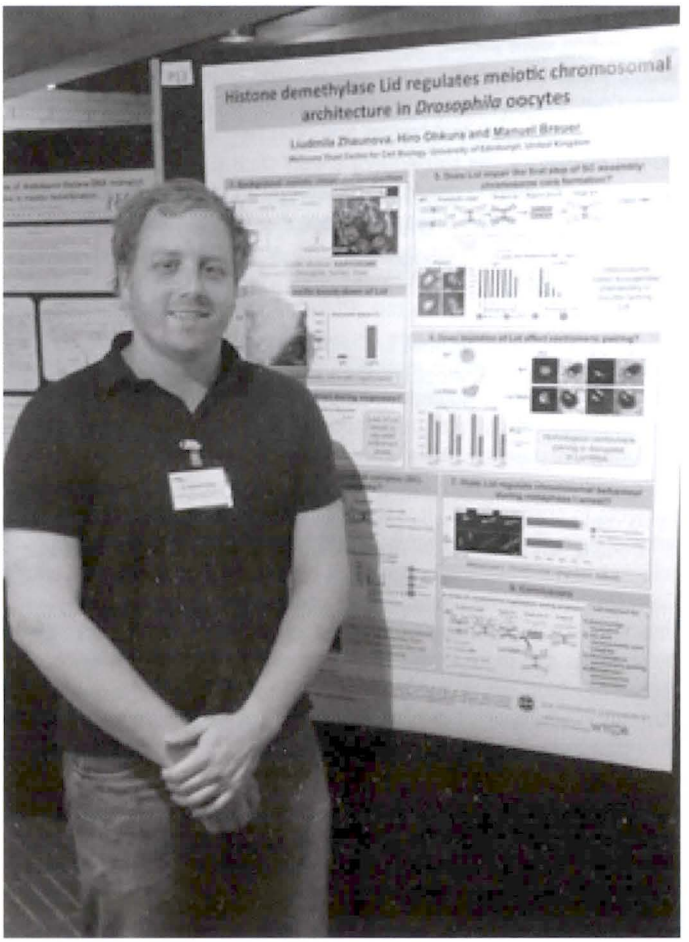
This year's meeting introduced speakers on genome evolution and hotspots to the participants. Ellen Leffler, from the Wellcome Trust Centre for Human Genetics in Oxford, talked about recombination hotspots in birds, work in collaboration with Columbia University, New York and the University of Chicago. PRDM9, a DNA-binding protein, has emerged in recent years as one of the key factors for the positioning of double stand breaks (DSBs) to initiate recombination. In the light of PRDM9 being absent in birds, Leffler elucidated how the evolution of hotspots is linked to genomic architecture, with increased recombination around accessible genomic sites. Interestingly, evolution of hotspots is very constrained, as these hotspots appear largely shared among the bird species examined.

The following talks and session revolved similarly around the question how DSBs are positioned in the genome and how this relates to specific genomic sites and also the role of the topological state of DNA in determining recombination hotspots. One highlight of the meeting was certainly the presentation of data on the identification of an interactor of Spo11, the catalyzer of DSBs across the phyla. Mathilde Grelon from IJPB-INRA, Versaille, France isolated a gene in the plant *Arabidopsis thaliana*, required for DSBs. Her close communication and collaboration with Bernard de Massy from the IGH in Montpellier, France, led to the identification of this long sought after Spo11-interactor also in mice, as he demonstrated in his talk.

Further sessions were dedicated to the mechanisms that lead to the maturation of DSBs into recombination events and the generation of exchange between homologous chromosomes and eventually crossovers between homologues which appear in visible chiasmata, linking homologues together prior to the first meiotic division. Interesting work was shown by Gerben Vader from the MPI in Dortmund, Germany, on how the kinetochore components on the chromosomes are involved in controlling DSBs and crossover formation in the genomic regions surrounding the kinetochores, work that is beging pursued in collaboration with Adèle Marston at the Wellcome Trust Centre in Edinburgh.

The meeting concluded on Thursday afternoon with a focus on the proteinaceous structure that assembles between homologous chromosomes, the synaptonemal complex. Anne Villeneuve and Abby Dernburg, from Stanford University and UC Berkeley in the US, showed work on the dynamics of SC assembly and in particular how the structure of the SC is altered with progressing meiosis.

Overall, it was a highly enjoyable meeting with a large variety of topics. The main organisers, Eva Hoffmann from the University of Sussex and Alastair Goldman from the University of Sheffield, did a great job in selecting not only the talks, but also the venue – after all, while the bad weather matched expectations of the non-UK participants for a British meeting, the food certainly was very good!




*Manuel Breuer*
*Wellcome Trust Centre for Cell Biology*
*University of Edinburgh*

# International Federation of Placenta Associations

8–11 September 2015. Queensland, Australia.

**The International Federation of Placenta Associations (IFPA) hold an annual conference that brings together both scientists and clinicians in the placental field to discuss the advances and novel research in placental biology. As a PhD student whose research investigates the interactions between maternal decidual cells and placental trophoblast cells in pre-eclampsia, it was an amazing opportunity to be able to attend such a relevant meeting.**

This year, the conference was entitled 'The Placenta: influence and impact' and was held in Brisbane, Australia. The first two lectures of the meeting were plenary sessions given by Kent Thornburg (The Moore Institute, Oregon Health and Science University, USA) and John Challis (University of Western Australia). Both lectures focused on the role that maternal factors and fetal sex have on the placenta during pregnancy, the subsequent effects on the pregnancy, such a preterm birth, and on the offspring later on in life – such as increased risk of heart disease or diabetes. This was one of the main focuses of the conference, being spoken about during many of the talks. Terry Morgan, Oregon Health and Science University, USA who also spoke about this in his talk 'Placenta and obesity' began by declaring that he could blame his weight not on the fact that he liked food too much but on his mother during her pregnancy. This got a good laugh from the audience and started a trend for others to begin their lectures with similar declarations.

During the meeting, there were three afternoon workshops that were split in to four parallel sessions, which gave a wide range of subjects to choose from. It was difficult to choose between such interesting subjects, so I attended the workshops that were most relevant to my PhD – 'Placental Pathology', 'Biomarkers of Placental Complications of Pregnancy' and 'Placental Immunology and Infection'. The workshops were made up of a number of short talks by students and more senior attendees who spoke about their research, which led to questions and discussions from the audience during the afternoon. The placental pathology session focused on the idea that maternal obesity increases the risk of fetal death and placental disorders due to excess hyperlipidaemia, impaired glucose tolerance and insulin resistance leading to placental dysfunction and inflammation. This was a very relevant topic as the incidence of obesity is increasing worldwide; therefore one of the concluding remarks was that steps need to be taken to limit gestational weight gain to reduce maternal and fetal risks. In the biomarkers workshop, it was discussed how basic science research, looking at biomarkers for early prediction of placental related diseases, can be translated into care of pregnant women.

I was given the opportunity to present some of the data from my PhD on a poster at one of the evening sessions. The poster sessions were very civilised affairs with drinks and canapes being served while people were able to study the posters and speak to the authors. I thoroughly enjoyed discussing my work, even though I got a few tricky questions from the judges! It was a great opportunity to get constructive criticism from others and has definitely given me some experiment ideas for the future. There were so many great posters on a variety of topics, it was hard to decide which posters to go and see as there just wasn't time to see them all.

As well as all the talks, poster sessions and workshops, there were some social events to help us let our hair down at the end of busy days. The first evening we were welcomed with drinks; this was a good chance to meet the other attendees and catch up with friendly faces. During this welcome reception I, and others, were awarded the prestigious YW Loke New Investigator Travel Awards. The second night, the early career researchers were taken to a pub where we got to know each other over a few drinks and dinner. The conference ended with a formal dinner in the Brisbane Exhibition and Conference Centre with beautiful views over the Brisbane River and the wheel of Brisbane. The three-course dinner was a great chance to sit with the new friends we had made over the meeting, where we got to try barramundi, a very tasty Australian fish! Everyone was in good spirits and after dinner the dance floor was full. I learned that the conference has its own 'theme-song' which was in fact the YMCA with the key letters changed to IFPA! It was a great end to an excellent conference.

Finally, I would like to thank BSCB for the Honor Fell Travel Bursary Award which allowed me to attend this conference. It was an amazing opportunity to be able to travel to Australia, where I learned a great deal, made new contacts and friends from across the globe and got to present my data. I hope to be able to return to IFPA next year in Portland, Oregon.

*Laura James-Allan,*
*St George's University of London*

# Neuroscience 2015

17–21 October 2015. McCormick Place, Chicago, Illinois, USA

**I arrived in Chicago for the annual meeting of the Society for Neuroscience, and met two of the other students from my lab. Having just spent a week in Toronto on holiday, I was not troubled by jetlag, but even so I was in for an exhausting but stimulating week.**

The meeting is open to researchers from all areas of neuroscience, from the most small scale molecular interactions to cognition and psychology. As a result, each day's running total of the number of delegates attending the Neuroscience meeting, which was intoned solemnly over the final lecture of the day, started big, and got bigger. By the final day the scales had been tipped at a little over 29,000, including attendees and exhibitors.

Obviously, with so many people and fields represented, it was not possible to see more than a small fraction of the science on offer. The sheer scale of the meeting made even visiting posters an odd cross between a Homeric Odyssey, and a military operation. With more than 13,000 posters split between 9 sessions, it seemed to me that every day a number of choices needed to be made.

Should I stay and try to fight my way through the crush of people around this exciting poster, or come back later and run the risk of the presenting author having disappeared? When to have lunch, when it will mean queuing with what seemed like all the rest of the delegates for an $11 sandwich? Should I try to get to this 15 minute talk I saw on the programme, when I only have a vague idea of where it is and how long it will take to get there, given that this building is at least the size of an airport terminal?

In the end, the agreed strategy was to spend a portion of each evening poring through the titles and abstracts of the next day's posters and symposia on the meeting mobile app (the paper programmes having been abandoned by the society some years before in an attempt to slow deforestation) to find those relevant displays that we hadn't managed to find in the searches we made before we arrived.

However, once I had seen the most relevant work in my immediate field, I often found myself eventually drawn to the 'Methods' posters, usually located in row BB, 26 rows and 5 minutes' power-walk away from my poster in row A (it was on cell therapy for retinal degeneration, since you ask). There I could stand for long periods listening to new developments in everything from graphene-cell interfaces (University of California San Diego, USA), to transparent electrode arrays (Brown University, USA), to new ways to precipitate ribosomes with associated mRNA still attached (Rockefeller University, USA).

I liked these especially because I was free to be fascinated by the potential of these new discoveries for use in my research (given infinite time and money, of course) without the pressure of feeling like I needed to fully understand all the technical aspects involved.

The Featured and Presidential special lectures, taking place as they did in the gargantuan main hall, had the difficult task of providing over an hour's talk which would be accessible and interesting to at least a large proportion of the attendees, representing as they did a wide range of experience and expertise.

Happily this was, for me, a success. One of my favourite lectures was an exploration of reprogramming neurons to change their fate and function by Paola Arlotta (Harvard University, USA). She spoke about the gene expression 'signatures' of different types of neuron, and how genetic reprogramming could change these signatures, and even the axonal connections that the targeted cells made.

Another was the memorable finale with Nobel laureate May-Britt Moser (Norwegian University of Science and Technology) who spoke about the discovery of grid cells in the hippocampus and ended with a film entitled 'My Running Rat' set to the accompanying crackle of a neuron firing.

Of course, it was not only posters and lectures. After these there were evening socials set up by subject areas in an attempt to tread a line between inclusivity, and the need to prevent all 30 000 people from attending, such as 'Pain' or the 'Vision' social which notably involved a quiz. Still later in the evening, less formal events sprang up, such as the SfN 'banter' social, which, unbelievably, included an open bar, and I was also lucky enough to attend a party thrown by a UK-based PI (apparently an annual tradition of his) whose name I won't mention in case of insurance implications.

My labmates and I were staying far beyond the outsize hotels from which the lab heads were ferried every day, in an altogether earthier part of the city. This made a commute on the 'L' train necessary (tricky for those unfortunate 8am lectures), but this was tempered by the fact that a dozen places to get proper Chicago deep dish pizza were very close by.

The SfN meeting is huge. In a lot of ways, smaller meetings can be more useful to get specific feedback on one's research, and meet people in the same area. However, it offers the opportunity to get an idea of what is happening and what is possible in the vast field of Neuroscience which is just not available to the same extent at other meetings. For this reason it is something of a rite of passage for young neuroscientists, and one that I am very glad I had the chance to experience.

*Paul Waldron*
*Institute of Ophthalmology,*
*University College London*

# BSCB Postdocs

## Hello from your postdoc rep...

### Alexis Barr

Hi Postdocs, I'm Alexis, your BSCB Postdoctoral rep. I sit on the BSCB committee to represent postdocs and ensure that the BSCB is doing all it can to serve us as a community.

The BSCB is committed to supporting postdocs – providing travel grants to meetings through the Honor Fell Travel Awards, providing advice on available Research Fellowships through the Postdoc area on our website, and by providing writing opportunities through our annual Newsletter and writing competition. However, the society wants to do more and wants to know from you how it could be helping postdocs – either on the academic side, or socially to help you get to know other postdocs working in the UK.

A bit of background about me (in case you're interested!). I'm a postdoc with Chris Bakal at The Institute of Cancer Research in London, and before that I was a PhD student at the CRUK Cambridge Institute with Fanni Gergely. I've always had a keen interest in the cell cycle, and over the last few years I've been trying to understand the signalling dynamics of cell cycle entry – in particular the control of the G1 to S-phase transition. I'm doing a lot of live cell imaging to follow the dynamics of proteins controlling this transition. We're then using these data to generate a quantitative, predictive mathematical model of the G1/S switch in order to understand how it is regulated both in healthy and diseased states. It's a challenge but an exciting one.

Outside the lab I'm also a STEM ambassador and a mentor for the Social Mobility Foundation. I think it's important not just to get children interested in science, but also to let them know that there are fun jobs in science. When I was child, I didn't know that I could be a scientist and do experiments all day as a job.

I hope to meet you all at a BSCB meeting soon. Please come and find me. In the meantime please email me if you have any suggestions for what you would like to see from the BSCB to help postdocs.

*Alexis (alexis.barr@icr.ac.uk)*

# Honor Fell/Company of Biologists Travel Awards

Honor FellTravel Awards are sponsored by the Company of Biologists (the publishers of *The Journal of Cell Science* and *Development*) and they provide financial support for BSCB members at the beginning of their research careers to attend meetings. Applications are considered for any meeting relevant to cell biology. The amount of the award depends on the location of the meeting. Awards will be up to £300 for UK meetings (except for BSCB Spring Meeting for which the full registration and accommodation costs will be made), up to £400 for European meetings and up to £500 for meetings in the rest of the world.

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To apply, complete the form below and send to Dr Ewald Hettema (e.hettema@sheffield.ac.uk; address on page 30). (A PDF of the form is available on the BSCB website. Applications must include:

- the completed and signed application form
- a copy of the abstract being presented
- a copy of the completed meeting registration form
- details of registration, travel and any other costs that will be claimed

The following rules usually apply (at the discretion of the Committee):

- Awards are normally made to those in the early stages of their careers (students and postdocs)
- Applicants must have been a member for at least a year (or be a PhD student in their first year of study).
- No applicant will receive more than one award per calendar year and three in toto.
- The applicant must be contributing a poster or a talk.
- No lab may receive more than £1000 per calendar year. Awards are discretionary and subject to available funds.
- Group leaders that have no grant money available may apply to attend the BSCB spring meeting
- If proof of payment for ALL costs claimed is available at the time of application, successful applicants will be awarded a grant in advance of the meeting.
- If proof of payment for ALL costs is not available at the time of application, successful applicants will be awarded a provisional grant and a cheque will be sent when BSCB have received the receipts.
- Incomplete applications will not be considered.

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## Application for Honor Fell/Company of Biologists Travel Award

Please complete, print out and send to Ewald Hettema at the address on page 30 together with supporting information

**Full name**

Work/lab address:

Email:

Age:

BSCB Memb. No:
I have been a member for years

Years of previous Honor Fell /COBTravel Awards:

Degree(s) (dates):

Present Position:

**Supporting statement by Lab Head:**
This applicant requires these funds and is worthy of support. I recognise that in the event of non-attendance at the meeting, the applicant must return the monies to the BSCB and I accept the responsibility to reimburse BSCB if the applicant does not return the funds.

My lab has not received more than £1000 in Honor Fell/ COB Travel Awards during this calendar year

**Signature:**

**Name:**

**Meeting for which application is made:**

Title:

Place:

Date:

**Expenses claimed**

Travel:

Accommodation:

Registration:

Have you submitted any other applications for financial support? **YES/NO** (delete as applicable)

If YES, please give details including, source, amounts and whether these monies are known to be forthcoming.

**Applicant's Signature:**

**Name:**

# The British Society for Cell Biology

## Statement of Financial Activities for the year to 31 December 2013

| | 2013 | | | 2012 |
|---|---|---|---|---|
| | Unrestricted | Restricted | Total | Total |
| | £ | £ | £ | £ |
| **Incoming Resources** | | | | |
| Incoming resources from generating funds: | | | | |
| Voluntary income | 35,000 | 35,000 | 70,000 | 65,000 |
| Incoming resources from charitable activities: | | | | |
| Meetings | 7,473 | – | 7,473 | 11,608 |
| Subscriptions | 26,941 | – | 26,941 | 24,477 |
| Investment income: | | | | |
| Bank interest | 701 | – | 701 | 1,611 |
| Other income | 383 | – | 383 | |
| Total incoming resources | 70,498 | 35,000 | 105,498 | 102,696 |
| **Resources Expended** | | | | |
| Charitable Activities: | | | | |
| Grants payable: | | | | |
| CoB/Honor Fell travel awards | – | 39,397 | 39,397 | 35,195 |
| Other grants | 12,647 | 1,193 | 13,740 | 7,622 |
| Studentships | 33,510 | – | 33,510 | 23,560 |
| Costs of meetings | 25,024 | – | 25,024 | 9,555 |
| Website expenses | 1,440 | – | 1,440 | 5,205 |
| Newsletter costs | 840 | – | 840 | 8,466 |
| Membership fulfilment services | 15,762 | – | 15,762 | 14,875 |
| Governance costs | 3,258 | – | 3,258 | 4,033 |
| Total resources expended | 92,381 | 40,590 | 132,971 | 108,511 |
| Net movement in funds for the year before transfers | (21,883) | (5,590) | (27,473) | 5,815 |
| Transfers between funds | (4,397) | 4,397 | | |
| Net movement in funds for the year | (26,280) | (1,193) | (27,473) | 5,815 |
| Funds brought forward at 1 January 2013 | 229,238 | 7,167 | 236,405 | 242,220 |
| Funds carried forward at 31 December 2013 | 202,958 | 5,974 | 208,932 | 236,405 |

| | 2013 | 2012 |
|---|---|---|
| | £ | £ |
| **Current assets:** | | |
| *Debtors* | | |
| Prepayments and accrued income | 7,714 | 19,197 |
| *Cash at bank and in hand* | | |
| National Savings Investment Account | 73,024 | 72,481 |
| Other Bank Accounts | 132,187 | 147,639 |
| *Total current assets* | *212,925* | 239,317 |
| **Liabilities** | | |
| *Creditors: amounts falling due in one year* | 3,993 | 2,912 |
| **Total assets less current liabilities** | **208,932** | **236,405** |
| **Funds** | | |
| Restricted funds | 5,974 | 7,167 |
| Unrestricted funds | 202,958 | 229,238 |
| **Total funds** | **208,932** | **236,405** |

# The British Society for Cell Biology

## Statement of Financial Activities for the year to 31 December 2014

| | 2014 Unrestricted £ | 2014 Restricted £ | 2014 Total £ | 2013 Total £ |
|---|---|---|---|---|
| **Incoming Resources** | | | | |
| Incoming resources from generating funds: | | | | |
| Voluntary income | 35,000 | 35,000 | 70,000 | 70,000 |
| Incoming resources from charitable activities: | | | | |
| Meetings | – | – | | 7,473 |
| Subscriptions | 30,002 | – | 30,002 | 26,941 |
| Investment income: | | | | |
| Bank interest | 1,475 | – | 1,475 | 701 |
| Other income | 916 | – | 916 | 383 |
| Total incoming resources | 67,393 | 35,000 | 102,393 | 105,498 |
| **Resources Expended** | | | | |
| Charitable Activities: | | | | |
| Grants payable: | | | | |
| CoB/Honor Fell travel awards | – | 33,400 | 33,400 | 39,397 |
| Other grants | 3.900 | 250 | 4.150 | 13,740 |
| Studentships | 18.400 | – | 18.400 | 33,510 |
| Costs of meetings | 17,968 | – | 17,968 | 25,024 |
| Website expenses | 14,757 | – | 14,757 | 1,440 |
| Newsletter costs | 2,650 | – | 2,650 | 840 |
| Membership fulfilment services | 17,479 | – | 17,479 | 15,762 |
| Governance costs | 6,775 | – | 6,775 | 3,258 |
| Total resources expended | 81,929 | 33,650 | 115,579 | 132,971 |
| Net movement in funds for the year before transfers | (14,536) | 1,350 | (13,186) | (27,473) |
| Transfers between funds | – | – | – | – |
| Net movement in funds for the year | (14,536) | 1,350 | (13,186) | (27,473) |
| Funds brought forward at 1 January 2014 | 202,958 | 5,974 | 208,932 | 236,405 |
| Funds carried forward at 31 December 2014 | 188,422 | 7,324 | 195,746 | 208,932 |

| | 2014 £ | 2013 £ |
|---|---|---|
| **Current assets:** | | |
| *Debtors* | | |
| Prepayments and accrued income | 7,230 | 7,714 |
| Other debtors | 1,435 | – |
| *Cash at bank and in hand* | | |
| National Savings Investment Account | 73,572 | 73,024 |
| Other Bank Accounts | 119,310 | 132,187 |
| *Total current assets* | *201,547* | *212,925* |
| **Liabilities** | | |
| *Creditors: amounts falling due in one year* | 5,801 | 3,993 |
| **Total assets less current liabilities** | **195,746** | **208,932** |
| **Funds** | | |
| Restricted funds | 7,324 | 5,974 |
| Unrestricted funds | 188,422 | 202,958 |
| **Total funds** | **195,746** | **208,932** |

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# BSCB Ambassadors 2015

The BSCB Ambassadors are the society's advocates in the UK cell biology community. They should be your first point of call for information about what the society can do for you and also how you can get involved. They should also be the people readily available to ask about sponsoring you for membership.
Anyone who wishes to volunteer to become a BSCB ambassador at any Institutes not represented in the list below please contact the BSCB.

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The BSCB newsletter is published once a year in Winter in hard copy

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If you have an idea for an article please e-mail the editor a brief outline first.

It is preferable to send all articles, reports and images by e-mail (though alternatives can be arranged after contacting the editor). Attachments for text can be in txt, rtf or doc format. Please send images as 300dpi JPEG, TIFF or PSD files.

Submission of articles and images should be made to

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