SPRING 2012

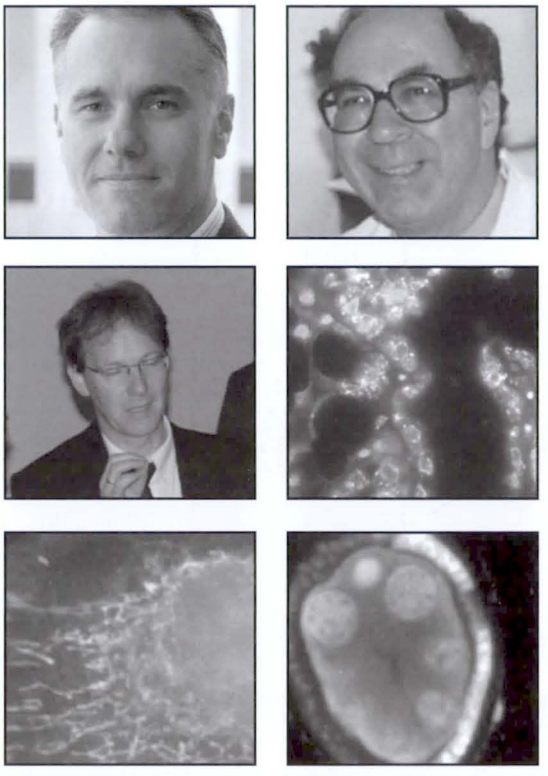
BSCB Newsletter

BRITISH SOCIETY FOR CELL BIOLOGY

Euro-Bioimaging
BSCB Science Writing Prize winner
Sammy Franks remembered

SPRING 2012

BSCB Newsletter



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Editorial

Welcome to the Spring/Summer 2012 issue of the BSCB newsletter. Hopefully many of you will have been to and enjoyed the Spring meeting at Warwick University, which was again a joint meeting with the BSDB. The Abercrombie meeting is the Autumn meeting this year and is taking place a little earlier than usual at the end of June. This meeting has a great list of international speakers (and me!) and will be held at St Catherine's College, Oxford.

I hope you enjoy reading this issue – it includes a selection of reports written by students awarded BSCB summer studentships. I love reading these reports because the students are very enthusiastic about their lab experiences – the scheme will be running again this year and the BSCB are offering 15 of these, an increase over last year and the year before. Also, you will find inside the usual conference meeting reports. My favourite is the one written by Neeven Hosny from the Imperial College London – love the photo taken in the pub! One of the feature articles is the essay "The Logistics of Cellular Traffic" by the winner of our 2012 Science Writing Competition, David Gershlick. Congratulations to David, who is a PhD student at the University of Leeds. I am also pleased to remind you of the 2012 BSCB Image Competition and the closing date for entries of 29th June – remember the winning entries get displayed on the cover of this newsletter and the prize money is more than enough for several drinks!

Within the News section is a taster piece about the significant revamping of the format for the BSCB/BSDB Annual Spring meeting, which will take place between 17–20 March at the Arts Centre, University of Warwick, next year. More information will be in the next Newsletter but the aim, in a nutshell, is to provide a broader content that is more accessible to the cell and developmental biology communities....watch this space.

The Spring meeting this year marked the exit of a key member of the BSCB committee – Adrian Harwood – who has been our Treasurer for many years – too many, probably, to his mind. A collective 'thank you so much" for all your work for the BSCB from all of us on the committee...and safe yachting, Adrian. Adrian has been an extremely influential committee member, and he, amongst other things, initiated the summer studentship scheme and, more recently, has driven and organized the takeover of the BSCB membership database by Portland Services. Caroline Austin (Newcastle) will be taking over from Adrian as Treasurer this summer.

Bring on the sunshine!!

The Editor: Kate Nobes
University of Bristol
catherine.nobes@bristol.ac.uk

The cover image is the 2nd prize entry in the 2011 BSCB Image Competition. Keiran Boyle's wonderful image shows a cultured hippocampal neuron in the early stages of synaptogenesis. The morphology of the neuron is visualised by staining with an antibody against tubulin. Incoming axons form synapses onto the neuron and are stained for VAMP2 and Synapsin-1. The deadline for the 2012 Image Competition is 29 June (see page 2 for more details).

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

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SOUTHAMPTON 46

Ref: 808892
Mr D F Archer

43 Lindsay Gardens St Andrews

Fife

KY16 8XD

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BSCB
PO Box 757
Cambridge
CB1 0RD, UK

The British Society for Cell Biology
http://www.bscb.org

B S C B

News

New Director for the Paterson

Professor Richard Marais has been appointed to the post of Director of the Paterson Institute for Cancer Research.

Prof. Marais' research focuses on the signalling events that drive the development and progression of melanoma, the most deadly form of skin cancer. His work was pivotal in demonstrating that mutant BRAF can be a founder event in melanoma and also in showing that it is a driver oncogene in this disease.

These validation studies underpinned the development of BRAF drugs by others. His own studies span a wide range of interests from basic science to transgenic models of disease, coupled with an active engagement in translational research from drug discovery to clinical trials. He is a member of EMBO and a Fellow of the Academy of Medical Sciences.

He has contributed to the organisation of many national and international meetings and has, for the last 4 years, chaired the annual Genes and Cancer conference in Warwick, a meeting that is a cornerstone of the UK Cancer Biology circuit. He is Secretary General of the European Association of Cancer Research and on the editorial board of several journals, including Cancer Cell and the European Journal of Cancer.

He is keen to continue to build translational research at the Paterson Institute and to take a leading role in the development of personalised medicine for cancer treatment.

BSCB Newsletter Cover Image Competition

We are pleased to announce the third year of the BSCB image competition. Entries should illustrate cell biology in any form and the winning images will be used as cover art for the newsletter. The closing date for entries for the 2012 competition is: 29 June 2012. Please see the full rules and entry requirements below. You must be a current member of BSCB to enter.

Eligibility

1. This competition is open to members of the British Society for Cell Biology. Entrants must be a member at the time of submission of entries.

2. Only one entry per person is allowed.

3. The subject matter of competition entries is flexible but must reflect current research in Cell Biology.

Submission

1. Entrants must supply their name, address, email address, and BSCB membership number on entry.

2. Entries must be sent by email (10 x 11.96 cm 300 dpi) to Paul Andrews (pdandrews1@mac.com).

Shortlisted entries will be requested on CD as 600 dpi JPG saved at maximum resolution sized at 196 mm wide x 230.5mm high and in RGB colour mode. At the time of submission, entrants must state clearly that they are the creator of the submitted image.

3. Your entry should adopt the file name initial_surname.jpeg e.g. a_einstein.jpeg.

4. Entrants should supply a concise stand-alone caption limited to 50 words as a MS Word document on the same CD, labelled initial_surname_caption.doc.

5. The deadline for entries is 29 June 2012

6. Entries that do not conform to the entry requirements will be disqualified.

Prizes

Prizes will be awarded as follows: 1st Prize £100, 2nd Prize £75, 3rd Prize £25

General information

1. Entries will be anonymized prior to judging.

2. The organisers reserve the right to cancel this competition at any stage, if deemed necessary in their opinion, and if circumstances arise outside their control.

3. The organisers' decisions are final in every situation and no correspondence will be entered into.

4. Entries will be published on BSCB webpages and will illustrate BSCB newsletters and other promotional material. Copyright will remain with the creator. If you do not agree that images may be used as stated you must stipulate this on the entry form.

5. Entrants will be deemed to have understood the competition rules and accepted them and agree to be bound to them when entering the competition.

New format for BSCB/BSDB Annual Spring Meeting

We are very excited to announce that next year's (2013) Spring meeting will be held in conjunction with the BSDB and will have a significantly revamped format. We will explain these changes in more detail in the next newsletter, but our aim is to provide broader content that is more accessible to the cell and developmental biology communities.

We hope that there will be something for everyone, and that the spring meeting will become a key event in your calendar – a great way to hear about the latest developments in your field and to find out what is happening at the cutting edge in related areas.

The 2013 meeting will have themed sessions on:

- Epithelia and Mechanosensing
- Cell Cycle and Death
- Motors and Morphogenesis
- Trafficking
- Gene Regulation
- Cancer Models
- Stem Cells and Regeneration
- Neurones and Nervous Systems
- Techniques

Location: Arts Centre, University of Warwick

Dates: **17–20 March 2013**

BSCB Organizers: Steve Royle (Liverpool) and Jean-Paul Vincent (NIMR).

BSDB Organisers: Fiona Wardle (King's College London) and Keith Brennan (Manchester)

Schools news: From my school bag

Readers who have in any way been associated with children of school age will know that looking through a 'school bag' produces a host of Ali Baba type surprises. They can range from P.E tee-shirts long past their 'wash by' date to a letter from school inviting parents to an Open Evening with your child's class teacher which happens miraculously to be to-night, or last night!

The contents of my 'school bag' for this Newsletter are guaranteed to contain only innocuous items.

Item 1 is an extract from statistics from (the) University and Colleges Admissions Service (UCAS) showing in Higher Education 'Applicants preferred subject choice and accepted applicants subject of acceptance'. These figures show that there has been a healthy increase during the last six years in the number of students interested in studying biological sciences as both applicants and accepted applicants.

The increase is healthy and shows that teachers, producers of 'Outreach' material and in many cases the media are providing a positive and encouraging image of the subject. We cannot however afford to be complacent, especially if waves from the growing anti-science movement in the USA hit our shores.

I have included figures for some other subjects for comparison. More subjects and figures are available on the UCAS website at www.ucas.com

Item 2 A copy of Siddbartha Mukherjee's book '*The Emperor of All Maladies, A Biography of Cancer*' [Published by Fourth Estate] and winner of both the 'Pulitzer Prize for Non-Fiction' and the 'Guardian First Book Award' in 2011.

This book is reviewed elsewhere in this Newsletter and judging from the number of people I have spoken to about it, I think it must be 'required reading'.

To me it is a 'must have and must read' book but clearly there will be some for whom this book would be disturbing. It is so interesting that I cannot think why it hasn't been written before; thankfully Mukherjee has written it now.

Item 3 is another book: '*The Epigenetics Revolution*' by Nessa Carey, published by Icon Books, (www.iconbooks.co.uk) London 2011 in hardback with the paperback edition March 2012. This volume attracted me because it is about a topic that is adding to and challenging traditional ideas so much that I am sure at some time in the not too distant future the topic of epigenetics will find its way into 'A-level or equivalent' work in biology in schools and colleges.

Item 4: New and forthcoming books and E-books for students.

From jblearning comes a new book on the desk: *Principles of Cell Biology* by George Plopper and a third edition of Lewin's *Essential Genes*. These books will be reviewed later. Details available at www.jblearning.com or by email from cgribble@jblearning.com

Garland Science at www.garlandscience.com have now made many of their best selling books available as e-books including: *Essential Cell Biology* and the well known *Molecular Biology of the Cell*. These e-books can be purchased by book, chapter, or rented for 180 days or 1 year.

W. H. Freeman in association with Palgrave Macmillan have announced that a 7th edition of Lodish. et.al. *Molecular Cell Biology* will be published in August this year, 2012.

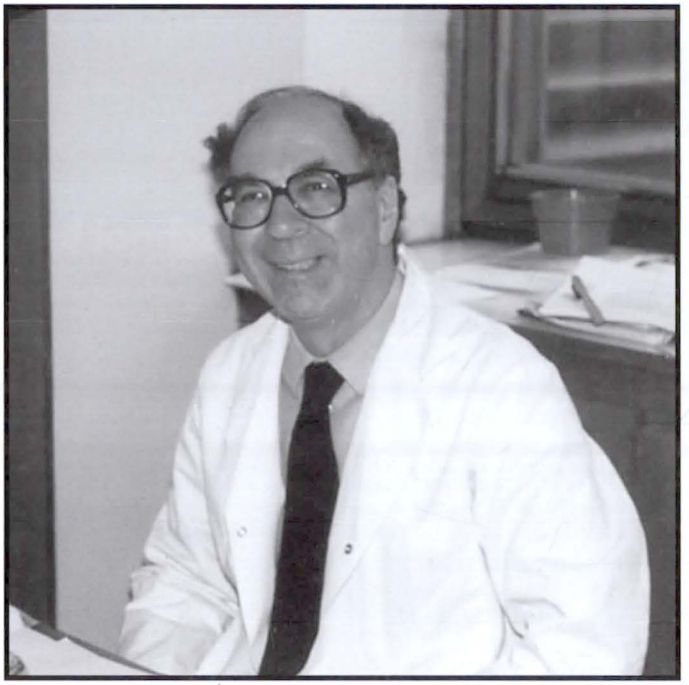
David Archer

UCAS Higher Education Applicants preferred subject choice and accepted applicants subject of acceptance

Subject Group (JACS)			Applicants			
	2006	2007	2008	2009	2010	2011
Medicine and dentistry	21,590	21,393	21,152	21,682	24,354	25,068
Biological sciences	34,282	36,128	38,109	40,805	46,473	48,165
Physical sciences	14,499	15,567	16,414	17,458	19,361	20,672
			Accepted applicants			
Medicine and dentistry	9,146	9,057	9,258	9,233	9,246	9,067
Biological sciences	31,321	33,321	35,598	37,049	38,892	40,227
Physical sciences	15,012	15,810	16,523	17,328	18,041	18,464

Leonard 'Sammy' Franks: 1921–2011

Last year, the British Society for Cell Biology lost one of its founder members - Leonard "Sammy" Franks. Sammy was the first secretary of the BSCB when it was founded in 1965. As a tribute to his work for the BSCB we are reprinting and edited version of the article written about him by Joan Marsh in 2005 after she met with Sammy and his wife to discuss the events that led to the establishment of the Society.



Leonard "Sammy" Franks was a medical doctor who served in Italy during the Second World War and had some fascinating tales to tell of his time there. On leaving the Army, he took a hospital position and was then one of the first people to work in a new unit studying human cancer - this was to become the Imperial Cancer Research Fund Unit in Lincolns Inn Fields, now the Cancer Research UK London Research Institute. Sammy worked on prostate cancer and, since this was a disease of old men, he also became interested in ageing.

Honor Fell was trying to establish organ cultures, so Sammy focused on cell cultures. This may seem routine today but was a major challenge at the time. The first to succeed was George Gey, who cultured over 200 human tumours before he managed to establish the HeLa cell line. Cells were grown in serum, either horse serum or placental cord serum collected from maternity wards. No antibiotics were used as the scientists were worried that these would alter the properties of the cells. People were not routinely looking at the cells in their cultures: Sammy examined the cells using electron microscopy and was able to demonstrate that the claimed 'surface antigens' were all bacteria. He wrote a paper for the International Review of Cytology in 1977 on the origin and ultrastructure of cells in culture that he said all students should read, even today, so that they know what they are looking at.

There was a European Tissue Culture Club dating from the Second World War or even earlier, but in about 1950, Sammy Franks, together with Honor Fell, John Paul, Michael Abercrombie and Neville Willmer, set up the British Tissue Culture Society. As time progressed, there was some debate in the USA as to whether a society should be based around a technique. Those working on tissue culture decided that there was a need for such a society and continued, while others founded the American Society for Cell Biology. A similar discussion occurred in the UK in the early 1960s and finally the British Society for Cell Biology was established. Honor Fell was the President and Sammy Franks later became the Secretary/Treasurer. Michael Abercrombie organized a very well attended first conference. This tradition persists and the Society holds an Abercrombie meeting every four years in Michael's honour.

The BSCB benefitted from another conference organized in St Louis, USA, in 1970 under the auspices of the International Federation for Cell Biology, which had four national societies as founder members (it now has over 50) and Sammy Franks was its Secretary-General. Half of the profits of this conference were assigned to the BSCB and used to establish the Honor Fell Travel Fund. Each year, many BSCB PhD students take advantage of this scheme to attend science meetings around the world; I doubt many of them know that the original requirement was that one should be beardless and not wear purple corduroy!

Adapted from the article written by Joan Marsh in 2005.

Euro-Bioimaging

Euro-Bioimaging is a bid to give all European scientists an opportunity to access the very best equipment, training and data-management possible.

As any group leader will know, imaging technology doesn't come cheap. A standard confocal with the automated stage and sensitive detectors demanded by today's research capabilities retails for a cool £300k. In larger research institutes and universities in the UK we often circumvent this problem by having managed core facilities where a team of specialists runs the equipment and research teams book time, as necessary, to use it.

In the past five years, imaging by light microscopy has advanced further still with such techniques as multiphoton, intravital and light sheet microscopy allowing visualisation deep into tissue, revolutionising mammalian imaging. Super-resolution techniques such as STED, PALM-STORM and SSIM and correlative light and electron microscopy, allow probing of structures between 100 and 20nm using standard fluorescent probes, thereby breaking the resolution limit and allowing live imaging of many organisms and sub-cellular structures for the first time. High content screening allows multi-parametric imaging experiments to be carried out at large scale, often including techniques such as FLIM and FRET which allow detailed spatial investigation of molecular interactions. These are, for the greater part, financially beyond all but the most generously endowed research institutes in the most financially successful countries. Even those with the capital to invest may not have the space or expertise on hand to manage the equipment or the projects.

Should these constraints be limiting our science? Would it not be good for us to have standardised access to training, data annotation, processing and management to ease collaborations within Europe?

At the behest of the European Strategy Forum on Research Infrastructure, these issues were considered by leaders in the light microscopy field and Euro-Bioimaging was born. This is a bid to give all European scientists an opportunity to access the very best equipment, training and data-management possible. It should allow European biologists the research opportunities equal to those offered to physicists at CERN. This is a highly commendable vision and one, it is hoped, that all funding agencies in Europe will support financially and in terms of infrastructure provision.

To realise this vision needs a large amount of administration and planning. The process began in 2010 and is anticipated to take three years. During this time it is anticipated that each EU member state will:

- Define the needs of the biomedical imaging user communities, which is addressed by the formation of 13 working groups encompassing all aspects of BioImaging from animal models to Electron Microscopy
- Prepare the plans for construction and operation of infrastructure facilities
- Develop a plan for harmonized/standardized access and training to imaging technologies
- Develop a plan for image data management, storage and processing
- Define the legal and governmental framework for the construction and operational phase and set in place the business plan to support construction and operation
- Based on the legal framework and finance plan, develop an overall business plan

The UK's response was to form BioImagingUK (www.bioimaginguk.org), an organisation of microscopy experts which collects, coordinates and represents strategic statements and policies of our national imaging community. It also implements and coordinates the UK based imaging infrastructure. In the next few months members of BioImagingUK will be working to produce a UK roadmap to develop and manage access to advanced imaging capabilities and expertise. This will involve gaining the backing of RCUK and other government agencies, as currently BioImagingUK is a collective on academics and imaging scientists who are dedicated to providing imaging infrastructure which can benefit the UK and European research communities.

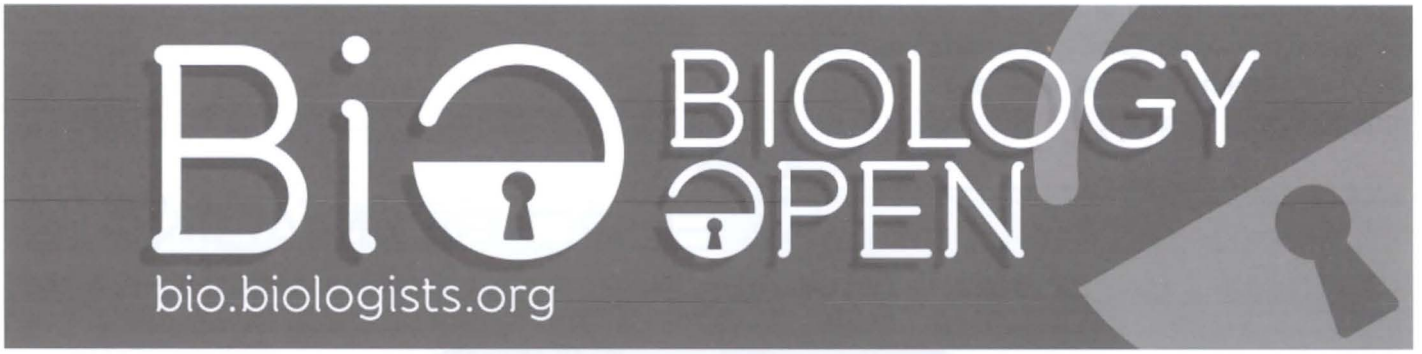
As part of the preparatory phase of Euro-Bioimaging, over 50 Proof of Concept Sites were formed, including four in the UK. These sites contain state-of-the-art light microscopy technology, and personnel with considerable expertise in using the technology for cell biology research. In November 2011, over 200 applications were made to conduct scientific studies at these Proof of Concept Sites as a test-bed for how Euro-Bioimaging would work. This will allow bidders the opportunity to conduct their research project using cutting edge imaging instruments in centres of excellence throughout Europe. It also will allow identification of current community needs for access to different technologies.

In the future it is hoped that the technologies available in centres of imaging throughout Europe will be made more widely available. This will give you, as a Cell-Biology researcher, the opportunity to realise those cutting edge imaging experiments, and also form closer collaborative ties with partners throughout the UK and Europe.

Dr Ann Wheeler,
BALM Facility Manager,
Blizard Institute.

Find out more at:
www.eurobioimaging.eu
www.bioimaginguk.org

The Company of Biologists announces its new journal...



An Open Access, online-only journal that facilitates rapid review for accessible research

• About *BiO*

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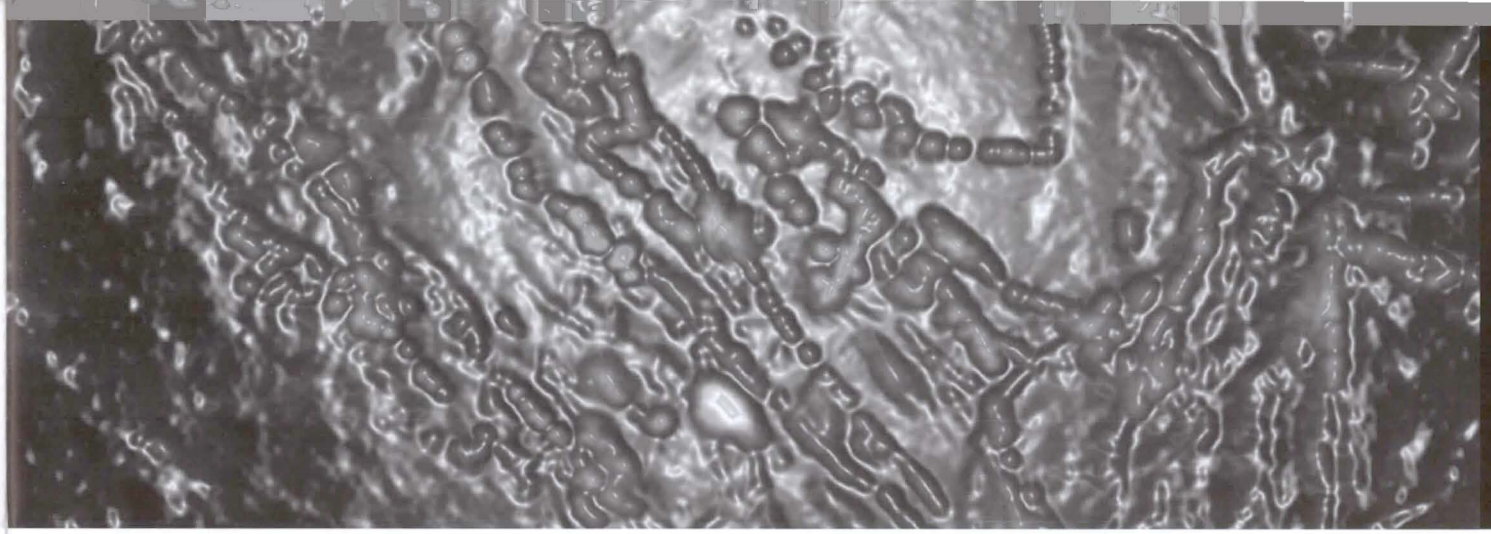
Average Decision Time: 9 Days (September 2011)

For more information on how to submit, visit bio.biologists.org



BSCB Science Writing Prize: The logistics of cellular traffic

We are delighted to announce that the winner of the 2012 BSCB Science Writing prize and £300 is David Gershlick, for his essay on 'The logistics of cellular traffic'. David is a PhD student with Jurgen Denecke at the University of Leeds. He is using biochemical and microscopy techniques to study protein trafficking mechanisms and receptor recycling in plants, and is enthusiastic about a career in research after his PhD.

We hope many of you will be inspired to take part in the 2013 competition!

In every cell proteins are continuously crafted and assimilated into the cells of intricate organisms. After synthesis the proteins get directed by a complex concert of cellular machinery, in order to assume their appropriate role.The eukaryotic cell can be roughly divided into several different sub-sections. Surrounded by a liquid membrane, analogous to the rubber of a balloon, cells contain a watery molecular soup which is further accompanied by membranous sub-compartments (referred to as organelles). These organelles form specialised environments with distinct roles and characteristics. Proteins fulfil functions within the membranes, at the membrane periphery or in the liquid throughout the cell. Organising these processes is a multifaceted task with numerous components needing to deliver particular proteins to specific destinations.

Scientists choosing the task of unravelling these phenomena had a complex assignment. Early techniques allowed cells to be sliced into thin sections and imaged or split open and separated. It was the 1974 Nobel laureate George Palade who coupled the observed structures with particular functions. Palade, faced with an unnerving array of cross sections of cells, wanted to understand how proteins leave the cell. The approach involved adding a radioactive element, which was incorporated into freshly made proteins, then checking where the radioactive proteins were at different time points. Essentially, the route a protein took through the cell was tracked. These observations set the stage for the introduction of the secretory pathway as a functional system of organelles.

In the following years many conceptual breakthroughs were made. One such event was the isolation and characterisation of the 'coated vesicle'. Vesicles are small spherical compartments shuttling from one organelle to another. Filled with proteins and other components they provide a mechanism for the transport of proteins, without having to cross a membrane. Vesicle budding/fusion events were characterised by in vitro reconstitution from isolated organelles. The rate at which these vesicles bud, migrate and fuse is unexpectedly high. It was once calculated that in mammalian cells there are approximately 155 of one particular type of vesicle budding per second. Cells are alive with hundreds of independent vesicles, sometimes travelling the length of the cell to specifically deliver their valuable contents.

In the late seventies researchers realised that there was a plethora of functional proteins waiting to be discovered. Yeast was the perfect organism for this work. They are single cells, with genomes simpler than mammalian or plant, but a seemingly as complex cellular architecture. Yeast geneticists led the way over the following 20 years with several key studies all with a shared principle. The genomes of whole populations of yeast were randomly mutated and screened to look for protein sorting defects, and the responsible mutation isolated. Although there was a degree of overlap in the studies, often new essential proteins were discovered. These methods identified a large array of effectors, allowing the mechanisms of specific processes to be elucidated.

Above: Vesicle trafficking inside a single cell, by Prof David Stephens, University of Bristol Art of Science Competition entry.

It was understood that if a protein needs to reach a particular cellular destination to fulfil its role then it cannot do so passively. They need to be directed somehow to fill the place reserved for them in the relevant vesicle or compartment. Thus, to differentiate proteins from one another, they have specific signals. This led to the distinction of 'cargo' that is transported, from 'receptors' that mediate transport steps. In a further layer of complexity, these receptors must continuously recycle to pick up another round of cargo, much like a postman returning to pick up more letters to deliver. Often receptors pass through multiple compartments to deliver cargo. These mechanisms and protein interactions occupy scientists (including myself) to this day.

With the discovery of fluorescent proteins the study of protein trafficking had a technical revolution. Fluorescent proteins light up in a distinctive manner, in a background of effectively invisible peers. Making fused chimeras consisting of a protein of interest attached to a fluorescent protein has become commonplace. Fluorescent microscopy allows observation of the location of a protein within the context of a three-dimensional cellular environment avoiding having to slice the cell into sections. Impressive recent advances allow single molecules to be observed, as well as the imaging of vesicles in living cells.

By complementing technical developments with scientific progress the conserved mechanisms that marshal a very complex system are being exposed. Associated with defects of the pathways there are various human disorders, where understanding membrane trafficking holds hope for effective therapies. A range of microorganisms are known to hijack these pathways obtaining access to the protected inner cell, a better understanding of these perturbations not only sheds light on the processes mediating homeostasis in healthy cells but would also drive medical innovations. In my field of plant biology we study these processes to not only to gain an understanding of cell biology but also to work towards global issues. Comprehending the secretory pathway allows us to progress to the goals of creating storage compartments in plant cells for industrial and pharmaceutical proteins, to generate extra-nutritious food and even to produce biofuel in a more sustainable and yet profitable manner.

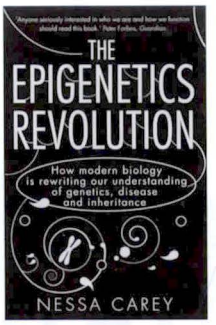
The revolutionary breakthroughs described in this article seem to have occurred every 5-10 years, and perhaps it would be prudent to anticipate another such progression. However, I believe, such predictions are misplaced. Science funding seems to have changed impetus from the so called 'blue-sky' research to an applied focus. Each of the advances discussed above are a direct result of curiosity driven blue-sky work, as any major novel innovations would also likely be. That is not to say that applied research is not valuable, but with the majority of researchers having to focus on foreseeable impact in order to justify funding, it would seem obvious that the likelihood of major unexpected breakthroughs decreases. However, if the historical advances have taught us anything, it is that progress can happen in unexpected places at unexpected times and it is an exciting time to observe the subtle mysteries of the cell being gradually disentangled.

David Gershlick, PhD student (Denecke group), University of Leeds.

Book Reviews

The Epigenetics Revolution

NESSA CAREY



The Epigenetics Revolution

Nessa Carey
Icon Books; London
www.iconbooks.co.uk

Hardback 2011
Paperback 2012.

This volume attracted me because it is about a topic that is adding to and challenging traditional ideas so much that I am sure at some time in the not too distant future the topic of epigenetics will find its way into 'A-level or equivalent' work in biology in schools and colleges.

Nessa Carey obtained a PhD in virology from the University of Edinburgh and worked for ten years in the biotech and pharma industry. She has also been a senior Lecturer in Molecular Biology at Imperial College, London and her technical knowledge and experience comes over in the book. I have loads of papers and articles about epigenetics and this book is a good distillation of current ideas and thinking.

A bookseller would display the title under 'Popular Science' and the jacket title and some of the chapter titles such as Chapter 1: 'An Ugly Toad and an Elegant man, Chapter 7: The Generations Game, and Chapter 15: 'The Green Revolution', together with the printing of text and diagrams in black and white, and the text, in continuous prose, would suggest this. Personally I am not happy about some of the chapter titles, but I understand why they have been used. What I did like very much was the warm way in which Carey mentioned the names of researchers in the field and a few comments about them as people. Inclusion of their website addresses to find out about their latest work would have been pleasant, but you cannot have everything! The book has an index, a glossary and under 'notes' there are bibliographic references, some website URLs; these are all listed chapter by chapter and referred to in the text by suffix index.

I found Carey's style clear, warm and engaging. Nessa covers all the current ideas about epigenetics very lucidly including, Waddington's Epigenetic Landscape and the amazing evidence presented by the 'agouti mice' of Emma Whitelaw's lab, the Dutch Hunger Winter and the 'Greedy fellows in Sweden' [a Carey sub-heading I liked!]. These examples will surely be mentioned in 'A-level Biology' or equivalent before long. Many more definite and possible findings about epigenetics are explained including some relating to cancer and plants.

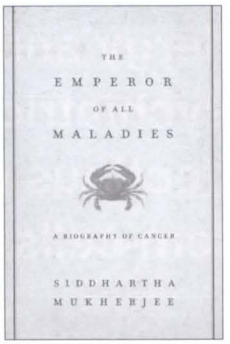
To appreciate the implications of epigenetics some previous knowledge of biology, especially basic cell and molecular biology, would be useful but not essential.

Epigenetics is already becoming the 'next big thing' in biology and I warmly recommend Carey's book.

David Archer.

The Emperor of Maladies – A Biography of Cancer

SIDDHARTHA MUKHERJEE



The Emperor of Maladies – A Biography of Cancer

Siddhartha Mukherjee
Fourth Estate, London,
Paperback, Sept 2011
£9.99
978-0-00-725092-9

It is unusual to be asked to review a book that in 2011 won both the Pulitzer Prize for Non-Fiction and the Guardian First Book Award. Such is the acclaim that this superb book has received from many professional reviewers and writers that I cannot do better than quote from some of them, and then add my own personal comments at the end.

John Carey for the *Sunday Times* said "This is a riveting book. It is terrifying too, of course. But the terror is offset by the intellectual excitement. Profound, searching and eloquent". And to quote a review in the Independent: "A story of pioneers and mavericks; of serendipity, risk-taking and wild leaps of faith; meeting of minds that changed medical history". Author David Rieff has called the volume "that rarest of things – a noble book". Others have said it is "magisterial" and the *Evening Standard* that it is "So beautifully written; this is literature, not popular science".

This is indeed an amazing book. It has the 'cannot put down' attraction of a good novel. Threaded through it are human stories, some heartrending ones of both patients and doctors, of dedicated researchers and oncologists, of sceptics and of self-publicists. These stories are interwoven with historical and sound biological information to produce a synergistic effect, giving the book attributes of both a novel and a work of non-fiction.

To those readers of the BSCB Newsletter who work in the field of cancer biology, and who may be familiar with many of the 'facts', I would say "I am sure you are, but to have them presented in the context of the political, competitive and not always 'patient sensitive' way that they were established, certainly sets them in a different light".

Anyone with even the slightest interest in biology, medicine and people will find this book fascinating. There are footnotes on some pages and sixty pages of chapter by chapter notes at the end of the book. There is a prologue at the beginning of the book and a glossary at the back where there is also an index and a transcript of an interview with the author.

I have just one caveat and a nationalistic comment. Do be sensitive about recommending this book. It shows how much we know, but also how much we do not know, and how difficult some cancers are to treat. Not a book some may wish to read. And my nationalistic comment: this book understandably mainly focuses on the cancer story in the USA. We must not forget that many advances in understanding cancer have been made in the UK and elsewhere.

Finally, this is a MUST HAVE and MUST READ book, buy it!

David Archer.

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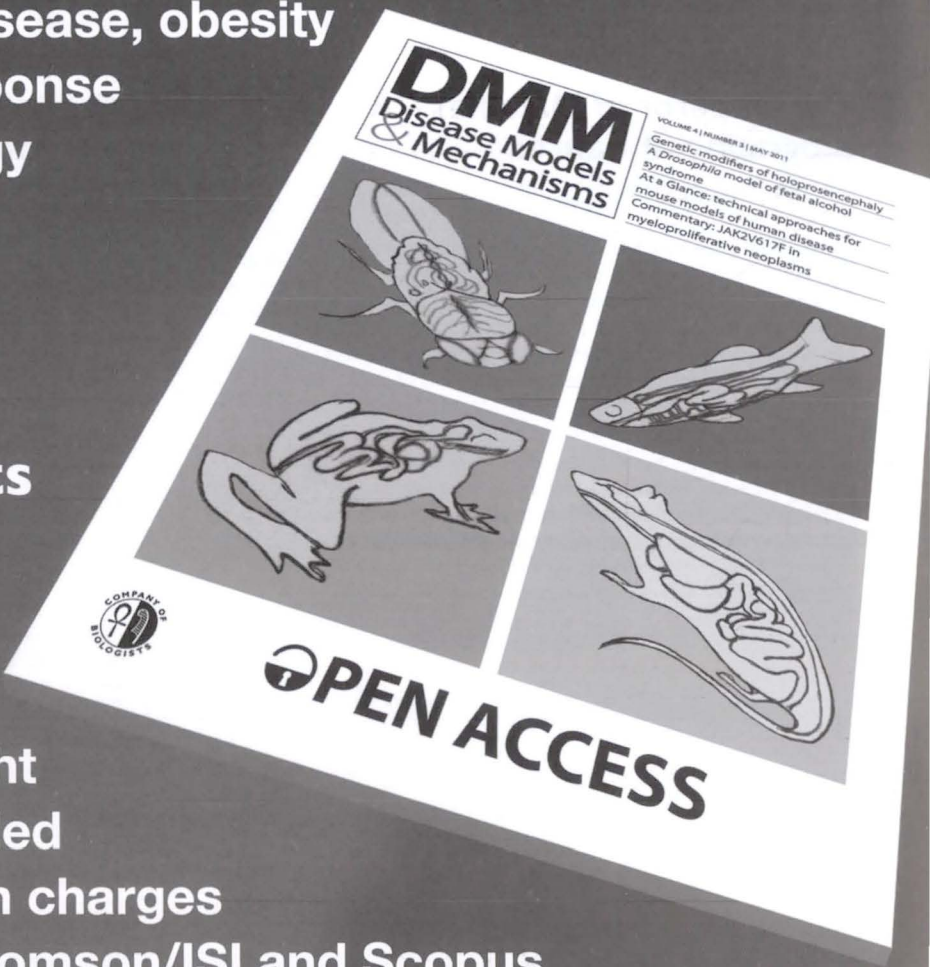

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Meeting Reports

Fungal Development and Pathogenesis

13–16 September 2011. University of Exeter.

The BMS meeting 2011 was held in the beautiful and friendly city of Exeter. Around 150 participants and 40 speakers from all over the world met at Exeter for the four-day meeting.

The meeting started on Tuesday at noon with registration followed by a cream tea break and a president's lecture by Prof. Lynne Boddy (Cardiff University). She talked about her career and showed lots of funny photos from when she did her field research long ago. She showed that different fungi have different morphological forms when growing on Petri dish plates and once you inoculate two different species in the same plate, a 'fungal war' takes place!

After breakfast on Wednesday, Prof. Sarah Gurr (University of Oxford) gave the first lecture. She alluded briefly to emerging fungi diseases and emphasized that microbes pose a significant threat to global food security and, particularly, the rice blast fungus *Magnaporthe oryzae*. She suggested that scientists must gather robust data, raise awareness of the need for research, assess and communicate risk and be involved in policy formulation. The onus lies with the fungal scientific community to ensure that policy-oriented organizations at the national and international level are able to access state-of-the-art information on risk to ensure effective and accurate decision-making.

A further six talks then took place all under the theme 'fungal development'. Prof. Stephen A. Osmani from University of Ohio State University (USA) gave a talk about mitotic regulation in *Aspergillus nidulans*. He explained that the NIMA (Never In Mitosis-A) kinase initiates mitosis by promoting partial disassembly of nuclear pore complexes (NPCs), which allows diffusion of proteins between the cytoplasm and nucleoplasm to help facilitate mitosis. He and his colleagues identified NPC proteins and tried to define how these complexes change during mitosis by using affinity purification and Mass Spectrometry.

The second session, about 'Infection related development', took place in the afternoon and was followed by posters and a reception for postgraduates.

On Thursday morning, 'fungal cell walls and remodeling' started with Jean Paul Latge's (Pasteur Institute, France) talk on the cell wall of *Aspergillus fumigatus*. He described the cell wall as having both protective and aggressive functions in fungal life because it is the first fungal barrier in contact with the often hostile environment and because all exchanges between the fungal cell and its environment rely on a functional and permeable cell wall. The central skeleton of the fungal cell wall of *A. fumigatus* is composed of chitin and 1,3 glucans and is cross-linked to other polymers, such as 1,3 glucan, galactosaminogalactan and galactomannan which also play roles in cell wall structure. In addition, he mentioned components of the cell wall play a major role in host immunity: hydrophobins hide the

fungus from host recognition whereas glucans stimulate the host defence and galactosaminogalactan and galactomannan suppress the host response. Dr. Carol A. Munro from University of Aberdeen talked about *Candida albicans* cell dynamics afterwards and my supervisor, Nick Read (University of Edinburgh) talked on hyphal chemotropism and cell fusion in Neurospora crass. After a short tea break, the second part of the morning session continued on this theme.

On the Friday afternoon, six talks were given on 'Effectors and host interaction'. After a short tea break and another poster session, Dr. Alex Brand (University of Aberdeen) was awarded the BMS Berkeley Award for Early-Career Mycologists and gave a Berkeley talk about 'Steering in the right direction'.

On the Thursday night, the conference dinner was held in the Holland Hall, which has an amazing view of the surrounding landscape. An auction of mycological material and 'memorabilia' to raise money for the student bursaries supported by the BMS was held at the dinner and this was an extremely funny and successful event!

Friday was the final day, and was when the 'transport and signalling' theme was held. Prof. Samara Reck-Peterson (Harvard Medical School, USA) talked about the mechanism of microtubule-based organelle transport. She was an outstanding speaker who was superb at explaining complicated things in a simple way. In her talk, she showed that *Aspergillus nidulans* requires microtubule-based transport for efficient growth and that organelles are transported by the microtubule-based motors cytoplasmic dynein, kinesin-1, kinesin-3. Endosomes and peroxisomes move bidirectionally and their mobility requires dynein and a dynein regulator, Lis1/NudF. Her group also found that Lis1 is a potent inhibitor of dynein activity in single molecule motility assays by using recombinant *Sacchromyces cerevisiae* proteins. Prof. Gero Steinberg (University of Exeter) gave the next talk on microtubule-dependent motility of nuclear pores. His talk showed that the nuclear pores in fungi move within the nuclear envelope in an ATP-dependent manner, which was very interesting.

After lunch, the last session of the meeting, 'Development and stress' took place. Five talks were given in this session.

After closing comments, a prize giving session ensued, where various awards were given for talks and posters as well as thanks to the organizers at Exeter University. I personally felt I gained much from the conference. I am extremely grateful to the BSCB for giving me a grant to travel to the BMS annual scientific meeting. It was very useful for my studies and my future work! Thanks!

Meiling Chu
University of Edinburgh

ECDO: 19th Euroconference on Apoptosis – 'Metabolism, Epigenetics and Death'

14–17 September 2011. Stockholm, Sweden.

Stockholm, home of the Nobel Prize, was the chosen destination for this year's European Conference on Cell Death (ECDO) entitled 'Metabolism, Epigenetics and Death'. The meeting attracted an array of world class cell death researchers and provided stimulating and insightful talks and discussions. The meeting welcomed approximately 300 international participants and was friendly and well-organised.

The European Conference on Cell Death (ECDO) is an annual conference held this year in the beautiful city of Stockholm, Sweden. This four-day conference took place in the heart of the city at Norra Latin – a venue originally established in 1880 as a secondary grammar school and now home to the largest centrally located meeting venue in Scandinavia. The theme of the meeting was metabolism and epigenetics – two key areas of current scientific research in the field of cell death.

The conference was opened with a keynote lecture from Sir Salvador Moncada (University College London) entitled "The Harnessing of Glycolysis and Glutaminolysis for Cell Proliferation". Here he discussed how previous scientific observations on nitric oxide and cellular respiration, dating back more than 10 years ago, permitted the re-examination of metabolism in astrocytes and neurons. This led to the identification of how both the bioenergetic and antioxidant state of neurons are controlled by the proteosomal degradation of key glycolytic enzymes. His talk provided a wonderful introductory lecture into what promised to be a great conference and was followed by a Welcome Reception for all delegates.

The following morning saw the opening of sessions one and two entitled 'Metabolic Control of Cell Death'. Tak Mak (Ontario Cancer Institute, Canada) started proceedings with an overview of his research on cancer cell metabolism including the importance of ROS homeostasis and oncogenic vs. metabolic addiction. This was followed by Eyal Gottlieb (Beatson Institute) who discussed metabolic defects in specific subtypes of cancers, such as mutated fumarate hydratase, and the potential use of large scale genomic and in-silico modelling of metabolic networks to define cancer

phenotypes. Furthermore, the de novo synthesis of lipids in cancer cells and the relevance of a lipogenic switch were discussed. Matthew Vander Heiden's (MIT, USA) talk on alternative glycolytic metabolism in cancer cells followed, which centred specifically on the role of the M2 isoform of pyruvate kinase (PKM2). He discussed the potential for a switch in metabolism depending on external cellular stresses and how metabolic reprogramming supports the growth of tumors. After a short break, Rinke Stienstra (Radboud University, The Netherlands) discussed the role of caspase-1 in obesity and diabetes and the session was concluded by Stephen Elledge (Harvard, USA) who discussed the use of genetic screens to identify key players in cancers, specifically following the activation of c-myc, and how these can be targeted by cancer therapeutics.

The afternoon session entitled 'Experimental Physiology of Cell Death' covered an array of talks including heat stroke-induced cell death by Nektarios Tavernarakis (University of Crete, Greece), the evolution of programmed cell death in plants by Peter Bozhkov (Uppsala BioCentre, Sweden) and the role of Pro-apoptotic ARTS in the resistance of stem cells to apoptotic stimuli by Hermann Stellar (The Rockefeller University, USA). This was followed by a memorial lecture for Jurg Tschopp – a pioneer in cell death research who sadly passed away earlier this year. Finally, the day was concluded by the first of two poster sessions, which together saw the discussion of nearly two hundred interesting poster presentations, and a reception and dinner at Stockholm City Hall (pictured), which is the venue for the Nobel Prize presentations and banquet and hence one of Stockholm's major tourist attractions.

Day three of the conference began with the theme – 'Cross-talk between intracellular Compartments during Cell Death' and was opened by Guido Kroemer (University Paris Descartes, Paris) who gave an insightful analysis of the importance of immunogenic responses for optimal anti-cancer therapy. This was followed by a talk from Marja Jäätelä (Institute of Cancer Biology, Denmark) on the potential of targeting lysosomes, specifically lysosomal acid sphingomyelinase, as a cancer therapeutic. The session was concluded by Andreas Strasser (WEHI, Australia) who provided evidence for a shift in the targeting of specific pro-survival Bcl-2 family members dependent on the stage of cancer progression.

The afternoon talks centred on the 'Biochemistry and Physiology of Cell Death" opened by Gerry Melino (MRC Toxicology Unit) who presented recent findings into the role of p73 in metabolic regulation and ageing. In the same session, Sarit Larisch (University of Haifa, Israel) further discussed (following Hermann Stellars talk) the role of pro-apoptotic ARTS in mitochondrial apoptosis and its potential to regulate the release of proteins from the mitochondria. The final session of the day entitled 'Epigenetic control of cell death' largely covered the use of HDAC inhibitors in cancer therapy including an overview of their role in the clinic, by Nicolas La Thangue (University of Oxford), and their ability to sensitise colon cancer stem cells to chemotherapeutics by Selcuk Colak (Centre for Experimental and Molecular Medicine, The Netherlands). The session was closed by JP Medema (Centre for Experimental and Molecular Medicine, The Netherlands) who gave a stimulating talk on colon cancer stem cells and their role in tumor growth and therapy resistance. The final talk was followed by the second poster session and the day closed with the ECDO Honorary Lecture presented by Klaus-Michael Debatin (University of Ulm, Germany) entitled 'Cell Death Research – Translation and Clinical Perspective'.

The final day of the conference returned to the theme of 'Biochemistry and Physiology of Cell Death' and was opened with an interesting talk by Nika Danial (Harvard, USA). Here she discussed how the same type of cancer (DLBCL) had different metabolic subsets and how these contribute to the pathogenesis of the disease. The remaining talks in the session provided a variety of discussions from mammary gland cell death by CJ Watson (University of Cambridge) to the role of non-apoptotic cell death in mice by Yoshihide Tsujimoto (Osaka University, Japan) and together concluded what was an interesting and enjoyable conference. I would therefore like to finish by thanking the BSCB for awarding me with an Honour Fell Travel Award, which gave me the opportunity to attend this stimulating conference and to present my research findings.

Gemma Robinson
MRC Toxicology Unit
University of Leicester

International Federation of Placenta Associations, 2011

14–17 September 2011. Geilo, Norway

I was lucky to be awarded a BSCB travel award which enabled me to attend the International Federation of Placenta Associations (IFPA) 14th European Placenta Group Meeting 2011. The tag line for this meeting was Placenta: predicting future health and this was the underlying theme of the entire meeting.

Delegates from around the world descended on the small picturesque mountain village of Geilo in Norway. Upon arrival at Oslo airport we were shepherded onto coaches which would take us to our destination, making it feel rather like a school trip with excitement buzzing round the coach as delegates caught up with old acquaintances. This friendly feeling continued throughout the meeting.

The conference began with an opening talk from the local conference organiser Professor Anne Catherine Staff dressed in traditional Norwegian costume. A local Norwegian singer also gave us a taste of traditional Norwegian culture singing traditional folk songs. Professor Colin Sibley, IFPA president, also welcomed us to the meeting and reinforced the friendly nature of this meeting encouraging younger delegates to feel free to talk to and discuss ideas with the senior members attending.

Some of highlights of the meeting were the plenary sessions given by Professor Mark Hanson, Southampton University UK and Professor Graham Burton, University of Cambridge, UK. These two sessions were both entitled Evolution, development and lifelong health, with Mark Hanson presenting data on how growth in utero determines later health including cardiovascular disease and obesity, whilst Graham Burton presented his elegant work examining the role of the placenta in determining uterine growth and subsequent health. Professor Peter Parham, Stanford University, USA gave a captivating insight into the role of the immune system and how this impacts on pregnancy success. During this talk Peter Parham managed to explain the complexities of the HLA system and its counterpart the killer inhibitory receptor and explain how certain haplotypes of HLA expression by placental cells and KIR expression by maternal immune cells were related to increased risks of pre-eclampsia.

The IFPA meeting is quite a unique meeting in that it offers workshops in addition to more traditional presentations, which are provided to allow more interaction between presenters and delegates often resulting in some quite passionate discussions, particularly in the debate that ensued in the workshop focussing on placental immunology.

In addition to the scientific workshops and plenary sessions this meeting also offered a number of training sessions for younger investigators to gain some valuable hints and tips from the experts in the field relating to writing grant applications and also how to form your own research group. This was a really valuable offering by the society and I know that all the other attendees at these sessions really appreciated the input offered from the leading experts that gave their time to provide these sessions.

During the two poster sessions the number of high quality abstracts that had been submitted to the meeting along with the number of new and upcoming young investigators making their mark in the field of placental research became apparent. Poster halls were crammed full and the hum of conversations of people discussing their work was audible from outside the rooms. Young investigators had the added worry of formal marking by the judges and it was always apparent those that had been judged and those still waiting for the judges to arrive by the big smiles on their faces. However all judges, being experts in this field were more than friendly and strived to put all young investigators at ease.

Adding to the informal nature of this meeting the conference organisers also ran a number of social events scattered throughout the programme of the meeting including the opportunity to sit out in the glorious sunshine at dinner time, eating hot Norwegian traditional style soup and take guided tours of traditional Norwegian wooden houses with the opportunity to buy traditional Norwegian handmade crafts. Furthermore, in the evening Norwegian games were organised and all attendees were split up into teams to solve 15 different tasks. I am sure this was a fix as the team with the IFPA president on was the winning team! But everyone had good fun and being forced to split up into teams where you didn't know anyone else, although a bit intimidating at first, was a really good opportunity to make new contacts and possible future collaborators. Tasks included identifying old Norwegian farming equipment, solving puzzles involving pieces of wood that had to fit into specific shapes and rolling a ball along some broken tubing whilst people were blindfolded.

The end of the meeting finished with a fantastic talk from Professors Chris Redman and Ian Sargent, University of Oxford, UK who presented their joint work on the role of the immune system and placental debris within the maternal circulation and how this relates to pre-eclampsia. Whilst Chris Redman presented the research that he has performed over his long career identifying placental microparticles within the maternal circulation, Ian Sargent went on to discuss the new techniques and approaches that they are using to further investigate this aspect. The meeting was concluded by the winner of the IFPA Award in Placentology, Professor Martin Knofler who gave an insightful lecture into his work looking at the molecular pathways involved in the regulation of trophoblast invasion.

Paula Williams,
University of Nottingham

European Muscle Conference 2011

14–18 September, 2011. Berlin, Germany.

This year's European Muscle Conference (or just 'EMC', as regulars like me call it) took place in Berlin, Germany and it was a special one: to celebrate the 40th anniversary of the meeting, the conference was opened in the 'Meistersaal' in the modern centre of Berlin. Kenneth C. Holmes (Heidelberg, Germany) delivered his keynote on "The Structural Basis of Muscle Contraction", followed by buffet and wine reception; it was a great chance to catch up with people you meet once a year at the EMC!

The venue of the remaining EMC was the Max-Delbrueck-Centre for Molecular Medicine in Berlin-Buch – a lovely, leafy campus with a very modern conference centre at the outskirts of Berlin. There were 12 scientific sessions as well as two poster sessions and, equally important, plenty of chance to discuss science over coffee and lunch breaks. Each scientific session consisted of two keynote talks delivered by the chair persons, plus three or four talks selected from the submitted abstracts.

To name the highlights of a conference is always subjective, but for me they were: the session on "Striated muscle diseases" chaired by Simone Spuler (Berlin, Germany) and Gisele Bonne (Paris, France), and the session "Regulation of Cardiac Functions" chaired by Jolanda van der Velden (Amsterdam, The Netherlands) and Wolfgang Linke (Bochum, Germany).

The importance of research into mechanisms of genetic diseases in striated muscle was highlighted by 16 talks, discussing various aspects of skeletal muscle and cardiac disease. Titin was certainly the "Molecule of the Week". The giant protein was featured in seven talks; in the "Sarcomeric Dynamics" session (chaired by Michael Gotthardt, Berlin, Germany, and Elisabeth Ehler, King's College London) three presentations highlighted the importance of titin phosphorylation for the functions of the protein.

A full session was devoted to "Invertebrate Muscle", underlining how valuable insects and molluscs are as model systems in muscle biology. This session was chaired by Belinda Bullard (University of York) and Stefan Galler (Salzburg, Austria).

A social highlight was the boat trip on the River Spree with buffet dinner and music. Anders Arner (Stockholm, Sweden) gave the entertaining after dinner speech and thanked Ingo Morano (Berlin, Germany) for organising the EMC2011.

The end of the meeting was another highlight: Hugh Huxley (Waltham, USA) closed the conference with his talk "The Structural Mechanisms of Muscle Contraction – 20 years and then 40 more".

It was great to see so many young scientists actively participating in the EMC, with oral presentations, posters and lively discussions. For the outstanding quality of her talk, Simona Boncompagni (Sansepolcro, Italy) was awarded with the Young Investigator Award, sponsored by the Journal of Muscle Research and Cell Motility. Homa Tajsharghi (Gothenburg, Sweden), Joanna Schneider (Berlin, Germany) and Mariola Zaleska (King's College London) were awarded a poster prizes, sponsored by the Deutsche Gesellschaft fuer Muskelkranke.

Despite its 40 years of age, the EMC is a modern conference with eight chairwomen and 40 % of the approximately 200 participants being female. Moreover, the next two EMCs will be organised by female scientists: Christina Karatzaferi (Thessaloniki, Greece) will organise the EMC 2012 on Rhodos, followed by Jolanda van der Velden, in Amsterdam (2013).

I am sure both will work hard to keep up with the high standards set by Ingo Morano with the EMC 2011 and I am looking forward to being there!

I would also like to thank the BSCB for supporting my participation in the EMC2011 with an Honor Fell/ Company of Biologists Travel Award.

Katja Gehmlich
Department of Cardiovascular Medicine, University of Oxford

Frontiers in BioImaging

20–21 September 2011, Manchester, UK

The first meeting of the Royal Microscope Society (RMS) "Frontiers in BioImaging" had 51 delegates and 7 exhibitors. It was held in Manchester, an excellent location considering it was where political powerhouses recently met to tend their flock and pat themselves on the back.

The conference was located next to the University in the Manchester conference centre, which also incorporated the accommodation at 'The Days Hotel'. The hotel itself seemed quite appropriate as it had a scientific influence noted by the large pendulum hanging in the foyer where the motion was governed by the natural rotation of the earth.

Frontiers in BioImaging focused on recently developed imaging modalities available for biological applications. Specifically covering fluorescence microscopy and comprised of fluorescence lifetime imaging microscopy (FLIM), fluorescence resonance energy transfer (FRET) and super-resolution, but also included coherent anti-stokes raman spectroscopy (CARS), micro-computer tomography (MicroCT) and electron microscopy. Even though this was a small-scale conference it brought speakers from all over the world, the atmosphere and genuine excitement gave the feeling of close-knit community not always apparent at large scale conferences.

The first day focused on super-resolution, fluorescence lifetime imaging and CARS. The seminars kicked off with Paul Selvin, University of Illinois, discussing "Superaccuracy & Super resolution" specifically focusing on the imaging of microtubules to investigate the relationship of movement between dyneins and kinesin. Microtubules were described as polar roads where the dyneins and kinesin operate as trucks travelling up and down them. Due to the sizes of these trucks (8nm) super-resolution provided a suitable method for their visualisation. This was achieved by attaching quantum dots to the ends of the kinesins and imaging them traversing along the protofilament. However these dyneins and kinesins do not just progress in a continuous linear motion, rather there are many stop-starts, as well as reverse and forward movements. The theoretical models for these were disputed until now with this clear visual representation of a tug of war between the dyneins and kinesin. More interestingly, it appears that the dynein reverses while the kinesin side-steps when confronted with obstacles on the protofilament before continuing to move forward.

The next speaker Achillefs Kapanidis, University of Oxford, discussed an innovative method for analysing over crowded data, captured with super-resolution. This applied a method used in astrophysics for analysing the night sky described as DAOSTORM where initial molecules are detected and fitted with Gaussian peaks. Any peaks missed in the residual are reanalysed and fitted, this is continued until all the particles in the image have been detected. This allowed them to superresolve *E. coli* and perform FRET on live bacteria.

Clemens Kaminski, University of Cambridge, looked at amyloid aggregation and discovered that as the fibrils grow they produce an endogenous fluorescence as they became more aggregated (doi: 10.1021/ja201651w). They used this to determine the level of aggregation, but not for identifying the number of monomer aggregates. It was assumed that this fluorescence arose from the ordered structure that was created and the interaction of the hydrogen bonds.

Susan Cox, King's College University of London, showed beautiful images of podosomes achieved with a new Bayesian analysis method called the Hidden Markov model (doi:10.1038/nmeth.1812). This allowed for rapid collection of super-resolution data, however the analysis time was quite long roughly 12 hours. It is hoped that in the future this analysis time will be vastly reduced and that is something her group are currently working on.

The nice thing about these talks was the amount of time speakers had to discuss their work. This provided listeners with an in-depth understanding of their background and reason for the work, which tends to be missed in shorter talks.

Talks were broken up in excellent fashion with ample tea and coffee breaks. Lunch was a buffet served up next to exhibitors that covered the interest of the attendees. Towards the end of the days sessions there where break off workshops given by Zeiss, Bitplane and PerkinElmer.

The workshop was followed by the poster session and wine reception there was a small collection of posters, about 15 in total, which generated a lot of interest and provided an opportunity to meet and discuss work with other researchers in a similar field. I also presented a poster entitled "Microbubble viscosity mapped using FLIM". This work focused on measuring the viscosity of microbubble lipid membranes through the application of a fluorescent molecular rotor via FLIM. The use of microbubbles as contrast agents in ultrasound is a well established technique, however the identification of viscoelastic properties are paramount for inducing efficient acoustic wave disruption, which can provide improved drug delivery. The ability to determine viscosity will allow modelling of the required acoustic frequency for different composition microbubbles and create a more effective acoustic-therapy.

After a few hours dinner was provided at the same venue, where everybody was invited for drinks to a local pub. The more adventurous of us continued on to another, blindly following the crowds ahead whilst avoiding the influx of fresher's out exploring their new surroundings. The evening ended at a different pub, which was very well located next to the accommodation, singing along to some brilliant 80s tunes. The following days talks covered 3D imaging and applications in integrating biology.

The day ended at about 5:00 where the majority of people made their way back south! I really enjoyed this meeting and can't wait for the next one. The future hope is for Frontier in BioImaging to become a biannual event complementing the RMS biannual Microscience meeting normally held at EXCEL. However, next year (2012) the RMS won a bid to host the European Microscope Congress (EMC), which will also be held in Manchester and will include Europe's largest exhibition dedicated to microscopes.

I would like to thank the RMS and British Society of Cell Biology (BSCB) for providing me with the funding to attend this conference.

Neeven Hosny
Imperial College London

CNRS-Jacques Monod Conference: Molecular basis for membrane remodeling and organization.

24–28 September, 2011. Roscoff, France

{ This meeting was organized by Harvey McMahon and Barbara Winsor and held in a beautiful beach resort town in Brittany, Roscoff. The meeting on membrane remodeling and organization included a diverse range of topics (e.g. endocytosis, vesicle budding and fusions, organelle morphogenesis, virus budding and fusion, membrane dynamics and diseases) with multidisciplinary approaches (e.g. cell biology, biochemistry, structural biology, biophysics and mathematical modeling). Because of its relatively small size the meeting was very interactive and provided a perfect niche for networking. }

Following welcome drinks and dinner, the conference started with the plenary lecture by James Rothman (Yale University, USA). He talked about how neurotransmitter release is controlled by SNAREs and its clamping protein complexin. He explained the structural and biochemical mechanisms of synchronous neurotransmitter release involving the cooperative array of partly zippered SNAREpins and their dissolution by the calcium sensor, synaptotagmin, which perturbs the array.

The first session on membrane curvature in endocytosis was a "leftover" from the previous two international conferences on PCH/F-BAR proteins. Pietro De Camilli (Yale University, USA) talked about Cip4, which contains an F-BAR module and belongs to a family of proteins (FBP17/CIP4/Toca1) that have been characterized as actin regulatory factors. Using an elegant *in vitro* reconstitution system, they have shown that Cip4 is a component of a protein network that couples membrane bending to Cdc42-dependent actin nucleation.

In the same session, Shiro Suetsugu (University of Tokyo, Japan) showed that human PACSIN2 is required for caveolae endocytosis and it is regulated by phosphorylation. He identified protein kinase C (PKC) as a kinase responsible for the phosphorylation, showed that phosphorylated PACSIN2 induces assembly of dynamin assembly and caveolae internalization.

Winfried Römer (University of Freiburg, Germany) presented his work on membrane tubulation and scission using artificial membrane systems. He showed that the scission of lectin-induced membrane invagination in giant unilamellar vesicles (GUVs) requires cholesterol-dependent membrane reorganization, which is triggered by actin polymerization, suggesting a previously unknown mechanism for generating negative membrane curvature formation and scission.

Alexandre Grassart (David Drubin Lab, UC Berkeley, USA) talked about systematic si-RNA based analysis of endocytic protein function by dual-color, real-time imaging. The group used Zinc Finger Nuclease (ZFN) technology to express RFP- and GFP-tagged clathrin and dynamin, respectively, preserving their endogenous levels and stoichiometry. They could sensitively detect loss of function phenotype of endocytosis using this system and successfully identify and grouped endocytic proteins into distinct functional classes.

Tom Rapoport (Harvard University, USA) beautifully explained how the morphology of the endoplasmic reticulum is generated. They found that ER tubules are regulated by two proteins, reticulons and Dp1/Yop1p, using hydrophobic insertion and scaffolding mechanisms to shape lipid bi-layers. The ER tubules are interconnected by atlastin to promote homotypic fusion of the tubules. They further demonstrated the reticulons and DP1/Yop1p are also a major determinant of peripheral ER sheets.

Pekka Lappalianen (University of Helsinki, Finland) talked about I-BAR domain proteins which usually generate/sense negative membrane curvature and are involved in formation of membrane protrusion. Interestingly, a novel mammalian I-BAR domain protein, Pinkbar, does not tubulate membranes but stabilizes membrane sheets by its oligomerization into sheet-like structures in vitro. They also examined how I-BAR, F-BAR and BAR domain proteins affect distribution and dynamics of phospholipids (PIP2) using fluorometric assays and live imaging of GUVs. Interestingly, at least mammalian I-BAR domains and yeast BAR/F-BAR domains significantly limit the diffusion of PIP2 suggesting their new roles in organizing membrane domains.

Britta Qualmann (Friedrich University of Jena, Germany) showed that a F-BAR protein Syndapin I is crucial for proper brain function in mice. Syndapin knock-out mice have defects in presynaptic membrane trafficking processes and in synaptic activity and that the animal suffers from seizures suggesting excessive hippocampal network activity. Detailed molecular analyses demonstrated that Syndapin I plays an important role in the recruitment of dynamin to the membrane. Consistently, Syndapin I KO mice phenocopy KO or mutant mice of Dynamin I suggesting that Syndapin I anchors dynamin to the membrane during regeneration of synaptic vesicles.

Oivier Daumke (Max-Delbrück-Center for Molecular Medicine, Germany) talks about the crystal structure of nucleotide-free human dynamin 1. Dynamin 1 oligomerizes in the crystals via the stalks, which assemble in a criss-cross fashion. The stalks further interact with the pleckstrin homology domain and the neighbouring dynamin molecule. This interaction rationalizes a number of disease-related mutations in dynamin 2 suggesting a novel structural model for the mechanochemical coupling.

John Briggs (EMBL, Heidelberg, Germany) presented his study about visualizing vesicle and virus budding by cryo-electron tomography and sub-tomogram averaging techniques. He presented his results from applications of these methods to COPI, clathrin and HIVGag mediated budding to identify intermediates of these processes.

Emanuel Boucrot (McMahon Lab, MRC-LMB, Cambridge, UK) presented a mechanistic basis for membrane fission by shallow hydrophobic insertion. Using a new assay to quantitatively measure vesiculation in a reconstituted system, they showed that epsin ENTH domain is sufficient to induce membrane fission. They found that epsin is required for fission of clathrin-coated pits, and rescues the block of membrane fission in dynamin-depleted cells. Their results support the mathematical model predicted by Michael M Kozlov (Tel Aviv University, Israel) that epsin ENTH domain is liable to promote membrane fission. Their results open the possibility of membrane fission in the absence of mechanoenzymes such as dynamin.

We were all shocked by the sad news that the co-organizer of the meeting, Barbara, passed away on the 29th September soon after the meeting. Although her health deteriorated at the conference, many did not know of her illness because of the genuineness of her smile and her interest in the details of the proceedings. I would like to thank Barbara for her professional dedication to the meeting with my deepest condolences (please see for tributes and thoughts in memory of Barbara Winsor by attendees of the meeting www.endocytosis.org/F-BAR_proteins/JMConference/barbara_winsor.html).

Finally, I would like to thank the BSCB for awarding me an Honor Fell Travel grant for me to attend this meeting.

Tetsuya Takeda,
Department of Genetics, University of Cambridge

The 26th European Cytoskeletal Forum (ECF) Meeting: Actin-Based Motility – From Molecules to model Organisms.

29 October – 2 November, 2011. Stresa, Lake Maggiore, Italy.

This excellent meeting was organised by Giorgio Scita (IFOM Foundation, Milan, Italy) and Michael Way (Cancer Research UK), and was held in the beautiful Italian village of Stresa, located on Lake Maggiore looking out onto the Borromean Islands. With a host of talks covering topics including actin nucleation machineries, signalling to and from the actin cytoskeleton, the membrane-actin interface, cell-cell adhesion and model organisms, this meeting turned out to be one of the most informative meetings that we have attended.

The meeting began on the Saturday evening with two talks; the first given by Margaret Frame (University of Edinburgh), who discussed her groups work on the role of the receptor tyrosine kinase Src and its substrate focal adhesion kinase in invasion and metastasis, and also the novel role for cofilin in EMT whereby cofilin knockdown resulted in mesenchymal transition and increased migration in a mouse model; the second talk was given by Chris Marshall (Institute of Cancer Research), who discussed the role of Rac in cancer cell migration and the transition to an invasive cell morphology with interesting results linking integrins to this process.

The first full day of the conference focused mainly on the regulation and functions of different actin nucleating machineries, ranging from a talk on the multiple roles of WH2 domains (Marie-France Carlier, Centre National de la Recherche Scientifique, France) to the assembly and disassembly of filopodia by Ena/VASP proteins and cofilin respectively (Jan Faix, Hannover Medical School, Germany). In addition Dyche Mullins described his lab's work on JMY, an activator of the Arp2/3 complex, which translocates between the nucleus and the cytoplasm and contributes to cell migration. He also presented data on nuclear pools of F-actin, the role of which is currently unknown. The lecture sessions ended with some informative talks discussing different biophysical approaches to actin cytoskeleton regulation, which were then followed by the first poster session. The evening finished with 6 formal poster presentations allowing chosen participants to elaborate on their data.

With a similar set-up to the first full day, the Monday began with a lecture session entitled "Signalling to and from the actin cytoskeleton". Among the speakers, Michael Way discussed his lab's findings that two important actin regulators, Mena and the WAVE complex, interact with each other to regulate actin cytoskeletal dynamics. In addition, Theresia Stradal (University of Münster, Germany) discussed her work on actin rearrangements during pathogen invasion and the additional role of IRSp53 in this process. Professor Stradal showed fascinating data that identified IRSp53 as the missing link between Enterohaemorrhagic *E. coli* and the Tir receptor, and as such highlighting an important role for IRSp53 in pedestal formation and host invasion. The afternoon session covered the topic of the membrane-actin interface, and included an excellent

short talk given by Jennifer Gallop (University of Cambridge) who discussed her data relating to the formation of filopodia-like structures from supported lipid bilayers, and results including preference for specific phospholipid composition of the bilayer, and the order of recruitment of different actin binding proteins at the potential site of filopodia formation. The afternoon session ended with a talk in which Giorgio Scita presented work showing the importance of endocytosis, and the small GTPase Rab5, in regulating actin dynamics. Following the afternoon talks, the second poster session was held with these posters all being based around work in model organisms. Again the evening finished with 6 formal poster presentations.

Tuesday was, perhaps, the most exciting day of the conference because as well as having a morning of talks, this was the day of the excursion! The morning's session was based on "cell-cell and cell-matrix adhesion and EMT" and included a short talk by Alpha Yap (The University of Queensland, Australia) highlighting his research on the actin filament stabilising role of N-WASP at epithelial junctions. After the morning's presentations we were taken down to the shore of Lake Maggiore, boarded a boat and taken across the lake, past the breathtaking Borromean Islands, to Villa Taranto and its beautiful gardens. Here we spent almost 2 hours being taken around the grounds by our guide, who had an endless knowledge about the gardens and surrounding areas. After taking in everything the gardens had to offer we were then taken by boat to the beautiful village of Polanza, which was directly across the lake from Stresa. Here we had time to visit one of the many cafés and look at the architecture, including the beautiful church and old town hall. Our excursion was followed by a delicious 5 course Conference Gala Dinner, where poster prizes were presented with the 4 best research posters winning an iPad! After the dinner we could let our hair down at the disco. All in all, the afternoon excursion and the gala dinner were a wonderful way to (almost) end the conference.

The final day of the conference consisted of a morning of talks based around the title "Model organisms and modes of cell migration *in vivo*". A particularly interesting talk given by Antonio Jacinto (University of Lisbon, Portugal) about wound healing and tissue repair in *Drosophila* was a highlight of the morning, with data showing that upon wounding a wave of intracellular calcium sweeps across the surrounding tissue followed by a wave of actomyosin contraction. The conference ended with a delicious meal in the hotel dining room before everyone departed. Although we were very sad to leave the beautiful views around Lake Maggiore, and the preferable Italian climate, it was lovely to be going home to rest after a brilliant but exhausting conference!

Georgina Barratt and Karen Pickering,
University of Manchester.

41st Society for Neuroscience Meeting

12–16 November 2011. Washington, DC.

A Saturday in late Autumn is a fine time to be in Washington, DC. The trees are erupting into blazing seasonal colours and the cold, blue skies give crisp outlines to the vast neoclassical buildings and the endless memorials to great figures from America's past. It is also a rather empty place at the weekend; the centre is somewhere that people work rather than live. Due to this fact, when 30,000 neuroscientists are in town for a conference that begins on a Saturday, they are pretty much the only people you see.

SfN is an American-sized conference, and anyone who is remotely connected to Neuroscience will have something with their name on it here. The sheer number of talks and posters beggars belief, and it is impossible for one person to see all the research that is on show.

The meeting began, very topically, with an interesting lecture from Robert Schiller (Yale Univ, USA) entitled 'How Human Behaviour Drives the Economy'. The basis of this talk was likening the economy to a brain, with individuals in the economy representing neurons. The bottom line of talk was that to understand the markets better, we need to better understand human beings, just as to better understand the functioning of the brain, we need to understand the functioning of individual neurons.

The Presidential Lecture in the afternoon was delivered by Mu-ming Poo (Berkeley Inst. Neurosci, USA), a towering figure in the field of axon growth and guidance. His talk gave a great historical perspective on the discovery and analysis of neurotrophins, and he also presented some new data on the roles on neurotrophins in synaptic plasticity both *in vitro* and *in vivo*. This included data that BDNF secretion is induced by spike-timing dependent plasticity, considered a more physiological stimulus for LTP than tetanic firing.

On Sunday, the conference started with a symposium on NMDA receptors. Highlights of this included Katherine Roche's (NIH, USA) talk on regulation of NMDAR surface expression, and the switching of NR2B to NR2A during development via a simple phospho-switch, involving 2 residues at the C-terminus of NR2A and NR2B, and casein kinase 2 (CK2). Another very interesting talk was by Adres Barria (Univ Washington, USA), who presented very interesting data on the regulation and trafficking of NMDA receptors by wnt signaling.

The afternoon was mostly taken up with the nanosymposium in which I was presenting my own work, on Homeostatic Plasticity. This

symposium was chaired by Richard Tsien, and presenting unpublished data in front of such a significant figure in neuroscience is certainly daunting! There were 10 talks in the symposium, and they included such diverse subjects as NMDA receptors, mRNA transport, mTOR and Nogo receptors, Ca^{2+}-dependent retinoic acid synthesis and my own topic, protein SUMOylation. All in all this nanosymposium showed clearly that homeostatic plasticity is a thriving field involving multiple proteins and pathways.

After this symposium, there were some excellent posters from two different groups (D. Choquet, CNRS, France and T. Blanpied, Univ. Maryland, Baltimore, USA) using advanced, high-resolution microscopy techniques to identify discreet postsynaptic AMPAR receptor clusters of 70-80nm, demonstrating the detail these techniques will allow us to visual synapses.

On Monday, my first appointment was at a nanosymposium on presynaptic mechanisms. This symposium contained many interesting talks, including identification of new factors involved in uncoating of clathrin pits, as well as a new role for the proteasome in tethering and docking of presynaptic vesicles.

The highlight of the day, however, was Erin Schuman's (Max Planck Inst. Brain Research, Germany) lecture on dendritic protein synthesis and degradation. Erin Schuman has been at the forefront of this important field for many years, and it is becoming increasingly apparent that many of the proteins required for dendritic functions are synthesized locally from mRNAs transported from the cell body. She presented recent data that there are at least 2500 distinct mRNA species to be found in dendrites and axons, and also demonstrated new techniques by which local protein synthesis can be analyzed.

Tuesday began with an interesting session entitled 'Live Imaging from Neuronal Development to Synaptic Plasticity'. Kimberly McAllister (UC Davis, USA) spoke about live visualization of synapse formation using cultured neurons, and demonstrated that compounds such as APV and NMDA affect synapse number by altering stability rather than synapse formation. Caspar Hoogenraad (Utrecht Univ, Netherlands) uses novel imaging techniques to define the routes by which cargo can be transported specifically to dendrites or axons. These two talks demonstrate some of the pioneering live imaging work presented at this conference which is providing new insights into synaptogenesis and synaptic plasticity. The afternoon was mainly taken up by poster sessions, one highlight of which was from M.J. Keuss (John Hopkins Univ, San Diego, USA) on the recently discovered protein Thorase, linking its interaction with GRIP1 to mutations known to lead to autism.

On the final day of the meeting, there was a symposium on translational control at the synapse in plasticity and disease. Joel Richter (Univ. Massachusetts Med. Sch., USA) delivered an excellent talk on control of cytoplasmic polyadenylation in synaptic plasticity. Another notable talk was by Eric Klann (New York Univ., USA) on the role of mTORC1 in regulation of FMRP, a known repressor of dendritic protein synthesis. Mice lacking components of the mTORC1 complex or FMRP showed an increase in repetitive behaviour, and this talk highlighted the delicate balance between plasticity and stability during memory formation.

A conference of this size contains within it all the major Neuroscience research being currently undertaken, but of course it has drawbacks: it is difficult or impossible to meet the people you want to meet and the event itself often seems vast and unwelcoming. However, for the sheer amount of information that can be gleaned from the thousands of posters and hundreds of talks, it cannot be beaten. This, coupled with the fact that it is usually in a great city (next year New Orleans!), means that every budding neuroscientist should attend it at least once.

Tim J Craig,
University of Bristol

51st Annual Meeting of the American Society for Cell Biology

3–7 December, 2011. Colorado Convention Centre, Denver, CO.

In December 2011, the 51st Annual Meeting of the American Society for Cell Biology took place and was hosted this time by Denver, Colorado. Having never been to either an ASCB meeting or to Colorado, this was an exciting trip. With over 4,100 scientists attending, of which nearly 1,300 are students (like myself), the ASCB Annual Meeting is arguably the biggest event of the year for cell biology. I was also very keen to experience the wonders of Colorado's famous ski slopes in the Rocky mountains, located right on Denver's doorstep.

This year's programme, coordinated by Jan Ellenberg (EMBL, Heidelberg), was focused around the idea of putting cell biology into context, to remind us that the cells we study in dishes come together to build tissues, and coordinate their roles to form functional organs that then make up whole organisms. On each day of the 5-day meeting, symposia were held, successively and methodically going from the very small scale of research (e.g. folding proteins with chaperones) all the way to the very large scale (generating artificial

tissues), with all the intermediates covered too (for instance, signalling pathways in cell migration, cytoskeletal organisation, protein expression feedback loops and collective cell migration to name a few).

All the speakers did an excellent job of integrating what had been said in the previous symposia into their own talks, and reminded us to keep in mind the bigger picture, remembering to put our own discoveries into the larger cellular context in order to fully understand their significance.

To illustrate the theme of the meeting, there are very few speakers as appropriate as Marc Kirschner (Harvard Medical School, Boston) to give the keynote lecture, so broad are the many areas of research in which he has provided ground-breaking data. His research fields have included (but are not limited to) Wnt signalling, the cytoskeleton, ubiquitin signalling, the cell cycle, cell size regulation and embryonic signalling in *Xenopus* and *C. elegans*, as well as work on embryonic stem cells. A fine example of work ranging from a small subset of proteins, to whole signalling pathways, to the regulation of whole-cell processes, to the development and function of whole tissues and organisms. Marc Kirschner gave an excellent talk, comprehensively taking the audience through the reasoning that took him and his lab members to uncovering entire pathways and their regulation. On more than one occasion, he admitted that he had been left bewildered at a particular experimental result, and was ready to give up when a colleague in a different field of cell biology provided the critical insight that led Marc and his team back on the right track. He underlined the importance of looking beyond our own field of research to colleagues in other disciplines in order to produce stronger science.

During the meeting, it was difficult at times to choose which talks or poster presentations to attend since there was constantly so much going on. From talks on how to publish good manuscripts, to meeting the leaders of the ASCB, to meeting fellow scientists and the top researchers in our own field to discuss cutting-edge science, the 5 days flew by, and were enough to get any avid scientist eager to get back in the lab to perform new experiments they had just thought of, inspired by a talk/poster/colleague.

There were of course awards given out to the most outstanding scientists, the Keith Porter Lecture being awarded to Jennifer Lippincott-Schwartz (U.S. National Institute of Child Health and Human Development, Bethesda) for her numerous contributions to cell biology. Her lab has, amongst other things, helped bring about the existence of the photo-activatable GFP and the use of FLIP (Fluorescence Loss In Photobleaching) to analyse the dynamics of proteins and membranes in live cells, as well as contributing to PALM and STORM, two types of super-resolution microscopes which have allowed scientists to break the light diffraction limit. Her lab has even started to use correlative PALM-electron microscopy, which produced some of the beautiful images displayed during her presentation.

Other awards included the E. B. Wilson Prize Lectures, this year presented to Gary Borisy (Marine Biological Laboratory, Woods Hole), James Spudich (Stanford University, Stanford) and Richard McIntosh (University of Colorado, Boulder) as rewards for the achievements they have accomplished during their careers. Whilst the two latter gave summaries of their lifetimes in the lab and highlighted how the biggest of their discoveries came about, Gary Borisy opted to give an explanation of the award itself and a short biography of Edmund Beecher Wilson, credited to be America's first cell biologist. The three awardees knew each other from early on in their careers, discussing their research and the interpretations of the results in letters, a few extracts of which were read out by Richard McIntosh. All three speakers displayed great humility, underlining the importance that their lab members had played and acknowledging their contribution to the award, pointing out that good science is almost always the product of teamwork. Watching the talks was both humbling and inspiring for me as a student, but I am sure many principle investigators in the room felt the same way.

For me, the ASCB meeting was a chance to meet and interact with cell biologists from around the globe, and with a strong emphasis put on the number of networking events by the organisers, there were plenty of opportunities. It was also an opportunity to feel part of a community of researchers working together, a chance to discuss the best science and to ask colleagues for their opinions, and sometimes even start a collaboration. Last but not least, it was also a chance to finally meet and put a face to all of the big names in my research field, whose publications I've read again and again, many of whom were actually not half as intimidating as I had expected them to be.

Overall, I would recommend attending the ASCB meetings to all cell biologists, but particularly to students. The meeting organisers put a lot of effort into making first time attendees feel welcome by including many networking sessions. For young cell biologists, the ASCB is possibly the best way to view the cell biology community, and to feel part of it. It is also a way for their research to be noticed by over 4,000 scientists, potentially lining up a postdoctoral position. I am very grateful to the BSCB for helping me attend this meeting, and I am hopeful that I will be able to attend another again soon. The 2012 meeting will be taking place in San Francisco, and I have my fingers crossed.

Liam Cheeseman
Physiological Laboratory
University of Liverpool

Keystone Symposia: Angiogenesis

16–21 January 2012. Snowbird, Utah, USA

This focused Keystone Symposia meeting 2012 was held in Utah, USA. Around 200 participants, including 50 speakers met at the breathtaking Snowbird Ski Resort for five days of excellent talks and posters.

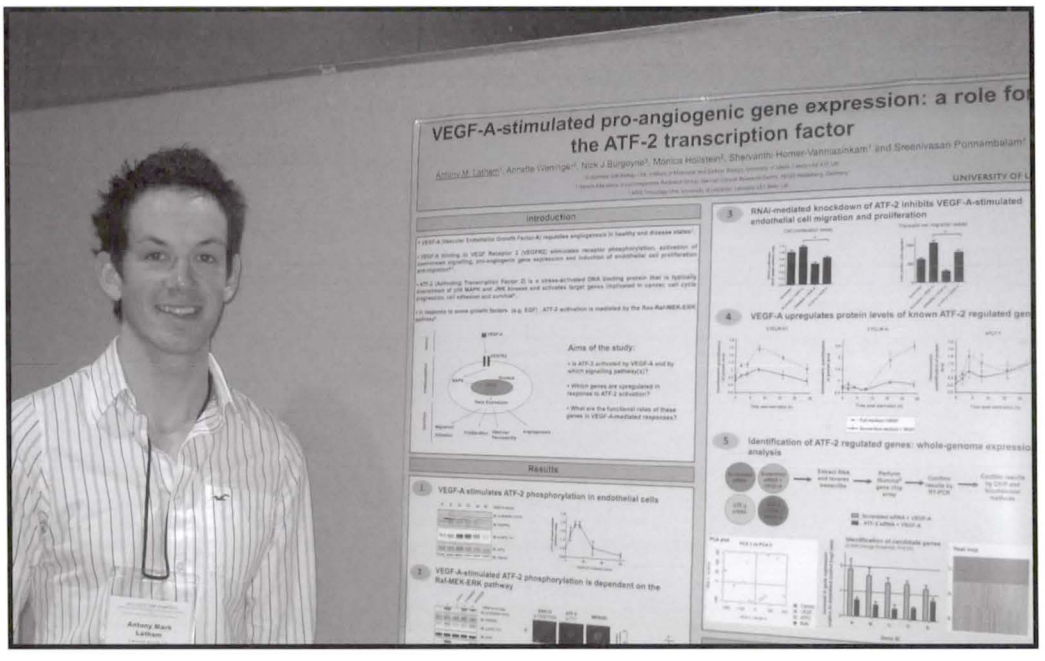
The purpose of this meeting was to critically examine the latest developments in basic science on the regulation of angiogenesis and to discuss how these can be translated into a clinical setting to treat diseases such as cancer and age-related macular degeneration. A range of topics were covered including vascular development, tumour angiogenesis, inflammation, hypoxia, and novel therapeutic strategies.

The vascular endothelial growth factors (VEGFs) are key regulators of new blood vessel sprouting and development, hence a large part of the meeting was devoted to furthering our understanding of how they function. In an inspiring introductory keynote talk, Kari Alitalo (University of Helsinki, Finland) explained the desperate need to elucidate the precise biological function of each VEGF isoform and splice variant in order to develop more appropriate angiogenic therapies. Ulf Eriksson (Karolinska Institut, Sweden) presented some exciting evidence that one isoform in particular, VEGF-B, as well as being an angiogenic factor in the heart, may play an important role in lipid and glucose metabolism. Knockout of the VEGF-B gene (or treatment with an antibody to VEGF-B) was able to confer protection against the development of type II diabetes in db/db mice.

The VEGF receptors (VEGFRs) are an equally important family of molecules and are attractive therapeutic targets. Michael Boulton (University of Florida, USA) presented interesting data showing that the cytoplasmic portion of VEGFR1 can be cleaved, the product of which can then translocate to the nucleus to regulate transcription factors such as NFAT, ETS1 and CREB1. Treatment of endothelial cells with a gamma-secretase inhibitor was able to promote angiogenesis. Luisa Iruela-Arispe (University of California, Los Angeles, USA) described an atypical mechanism of VEGFR2 post-translational modification by reactive oxygen species (ROS). She argued that ROS can activate the Src-family tyrosine kinase Yes, leading to VEGFR2 phosphorylation independent of VEGF. Surprisingly, VEGFR2 activation did not require receptor dimerization or its intrinsic kinase activity under these conditions and took place not at the plasma membrane, but at the Golgi apparatus. There is also significant interest in the trafficking of these receptors. Ralf Adams (Max Planck Institute, Germany) showed that a tripartite complex containing the clathrin-associated sorting protein Disabled 2 (Dab2), PAR-3 and ephrin-B2 binds to both VEGFR2 and VEGFR3 to regulate receptor endocytosis. Bill Sessa (Yale University School of Medicine, USA) also introduced us to some fascinating mouse models demonstrating the critical role of dynamin-2 in VEGFR2 endocytosis and angiogenesis.

The reciprocal links between inflammation and angiogenesis in the tumour microenvironment are becoming more apparent. A highlight of the meeting was a talk by Tatiana Byzova (Cleveland Clinic Foundation, USA) on the role of Toll-like receptors (TLRs) in angiogenesis. She explained that a family of lipid oxidation end products called carboxyethylpyrroles (CEPs) are generated during wound healing and in the tumour microenvironment. CEPs can bind to TLR2 and induce an angiogenic response independent of VEGF. This work not only describes a completely novel pro-angiogenic pathway, but also opens the door for a wave of new therapies.

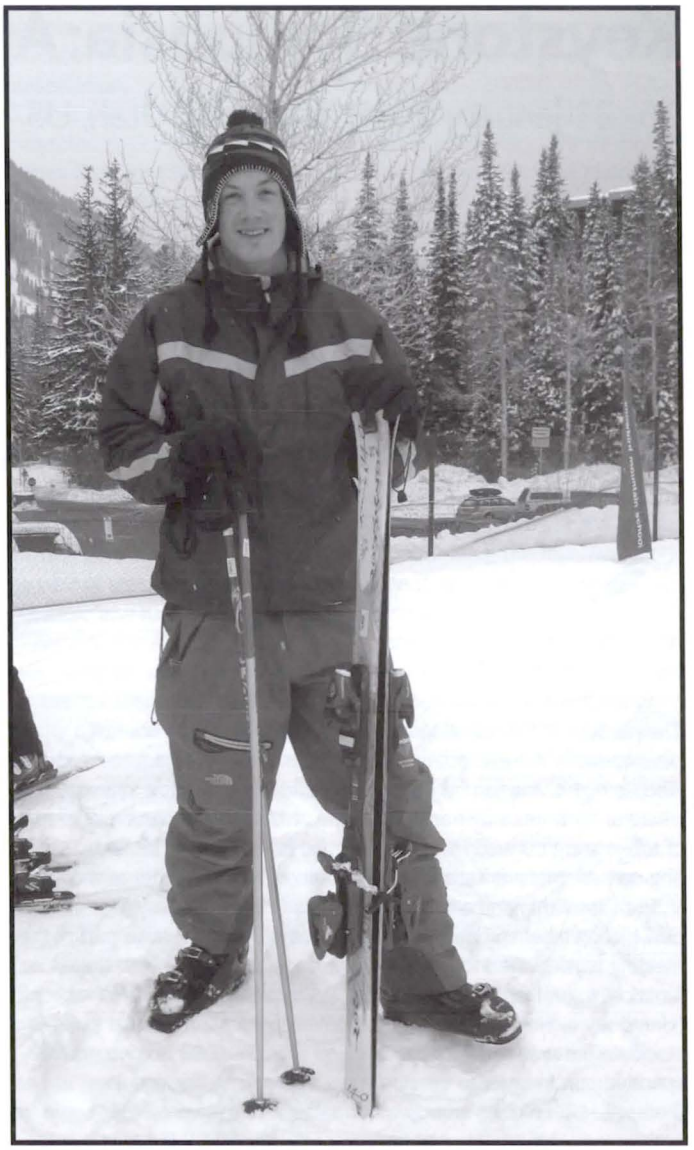
Much excitement surrounded current 'hot topics' in the field. The novel concept of 'angiocrine signals' states that a blood vessel is not



merely a passive organ receiving cues from surrounding tissues to grow and divide, but indeed actively secretes various soluble factors, enabling reciprocal crosstalk. This idea was explained neatly by Shahin Rafii (Weill Cornell Medical College, USA) who showed that vascular derived 'angiocrine factors' such as MMP14, IGFBP2 and the Notch ligands Jagged1 and 2 are important in haematopoietic stem cell renewal and organ regeneration. In addition, Lee Ellis (MD Anderson Center, USA) presented significant evidence to suggest that endothelial cells can indeed 'talk back' to tumours and evoke cancer stem-cell-like properties. An additional emerging field is the rationale behind targeting metabolism to inhibit angiogenesis. Peter Carmeliet and Maria Georgiadou (University of Leuven, Belgium) showed that signalling through the Delta-like 4 (Dll4)/Notch pathway in endothelial cells induces quiescence in a p53-dependent manner and metabolically reprograms endothelial cells, shunting glucose away from the glycolytic pathway into the anabolic oxidative pentose phosphate pathway. This led them to pose an interesting question: could targeting metabolic pathways specific to vascular cells be a novel therapeutic strategy? On a systems level, Ken Walsh (Boston University School of Medicine, USA) postulated that an imbalance of adipokines, namely adiponectin may be an important link between metabolic disease, obesity and vascular dysfunction. A talk by Raghu Kalluri (Harvard Medical School, USA) also sparked very interesting discussion about the possibility of targeting pericytes (cells which stabilize and mature endothelial cells) to inhibit tumour growth.

The concluding sessions of the meeting covered aspects of clinical trials of angiogenic therapies. Brian Rini (Cleveland Clinic, USA) gave a very sobering overview of the slow progress we have made with anti-angiogenic therapy since the introduction of the first anti-VEGF antibodies into the clinic in 2004. He explained that even though small molecule tyrosine kinase inhibitors can provide many months progression-free survival in some patients with primary kidney cancer, they are not effective in metastatic disease or more aggressive cancers. There is lack of a suitable biomarker to select those patients that will respond well to therapy and for many sufferers we still don't know the optimal duration and/or combination of therapies. For the future, he suggested we need to examine the mechanisms of inherent refractoriness and resistance to therapy; we need better pre-clinical models of metastatic disease and we need to engage clinicians earlier in the development of these models. In the same vein, Robert Kerbel (Sunnybrook Research Institute, Canada) told of a highly innovative human tumour xenograft mouse model of metastatic cancer developed by his group. He concluded with a recognition of our need to 'raise the bar' by testing new lead drugs on pre-clinical mouse models of metastatic disease, not just primary tumours. Thus, in order to develop successful therapies we need to challenge our current mindset and create more clinically relevant endpoints in our models.

I would like to thank the organisers Napo Ferrara (Genentech Inc., USA), Anne Eichmann (College de France, France) and Ken Walsh for this well-structured and thought-provoking meeting in a superb location. In between the array of fascinating talks and posters, it was also great to have time to get out on the slopes in the fresh powder! Most of all I would like to thank the British Society for Cell Biology for awarding me an Honor Fell Travel Award and for giving me the opportunity to attend such a fantastic meeting.



Antony Latham
University of Leeds

BSCB PhDs

Conferences: More than a chance for an exotic holiday

Kimberley Byron

The snow has fallen and melted away and that can mean only one thing, spring is just around the corner. With spring fast approaching this means that the BSCB Conference will quickly be upon us and I look forward to meeting a number of you at Warwick.

I decided to write this column about conferences as I know that now is the time that a lot of you will be writing abstracts and picking conferences. Asides from Warwick, I am hoping that I can get funding to go to Heidelberg in June to a worm neuroscience topic meeting (the area that my PhD is on).

Initially, this seemed very exciting as I have never been to Heidelberg so I may stay an extra day or two afterwards to have a look around. It will also be a great chance to showcase my work to experts in my field and perhaps even make some useful contacts for collaboration. It will more importantly tell me how close my competitors are to scooping us and it might inspire me to work some more late nights.

However, the excitement of my own trip to Germany was somewhat dampened by the discovery that my soon-to-be husband is about to go jetting off to Melbourne, all expenses paid. It isn't even like he has chosen a tenuously linked topic to justify a holiday (I have friends who did just that so that they got to go to Hawaii). This is the conference for people in his field and this year (his final year) he has been selected to talk and consequently managed to get full funding. For him this trip to Australia is all about making contacts to find an elusive post-doc position. It is not about sight-seeing or a holiday. It is his chance to gain feedback on his PhD project and to network. After all, this is what conferences are about. Exotic locations are a wonderful bonus.

Perhaps I wouldn't be quite so jealous if he hadn't gone to Montreal (via Niagara Falls) last year or Stockholm the year before. I shouldn't grumble though, at least I am going to conferences and I did fail to mention that last year the International Worm Meeting was in L.A.....

I know a number of PhD students who haven't yet been to any conferences. For some their supervisors feel that it is too early in their career to go or that the students themselves are simply too busy. I disagree. Last year in L.A., I learnt new techniques and found useful contacts for strains and plasmids. I learnt a lot more in that week than I did by simply reading papers.

Other students that I spoke to suggested that it was a lack of funding that is the issue and that they needed to keep all their travel money for their final year. If this is a problem, don't forget that as a BSCB member you can apply for up to £500 for an international meeting each year. Many conferences also have separate travel funding for students that you can apply for if you are presenting.

Conferences are a wonderful chance to meet other like-minded scientists and hopefully friends. They allow you to see your work in a new light and to find out what your competitors are up to. It shouldn't matter whether it is in Warwick, Oxford, Birmingham, Heidelberg, L.A. or Melbourne. Although if I was given a choice to pick a location for the same meeting, I would pick somewhere sunny ;) .

Kimberley Bryon,
PhD student rep,
MRC LMCB University College London

BSCB Summer studentships

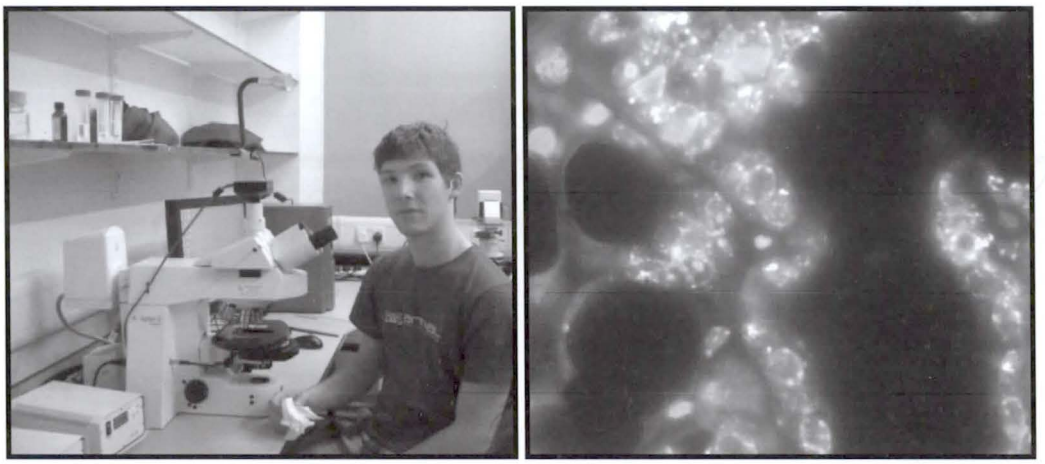
2011 saw the fourth cohort of undergraduate students enter labs to undertake 8 week summer projects funded by the BSCB. These studentships provide valuable experience and the number awarded increased this year to 11 studentships. Details of the 2012 round can be found on the BSCB website, including full details of the application process.
http://www.bscb.org/?url=studentships/index

Investigating a lysosomal pathway of cell death in mammary gland

Immediately following the end of the academic year, I embarked on my first summer research project in Professor C J Watson's lab at the Department of Pathology in Cambridge. Straightaway I felt welcomed and cared for by her and her team, who took me through the logistics and protocols required to work in a modern lab. My project involved looking into the role carried out by Stat3 in post-lactational regression of the mammary gland; one of the most extensive physiological cell death events in adult mammalian organisms. It has been established by the group that a novel form of cell death occurs that is unlike conventional apoptosis in that cathepsin enzymes originating from within lysosomes are the principle effectors. The mechanism by which cathepsins leak from lysosomes, and the upstream signals that interact with Stat3 to control this leakiness, are not known. The aim of this project, therefore, was to investigate potential regulators of lysosomal membrane permeabilisation, such as LAMP1, using fluorescent de-convolution microscopy and other means.

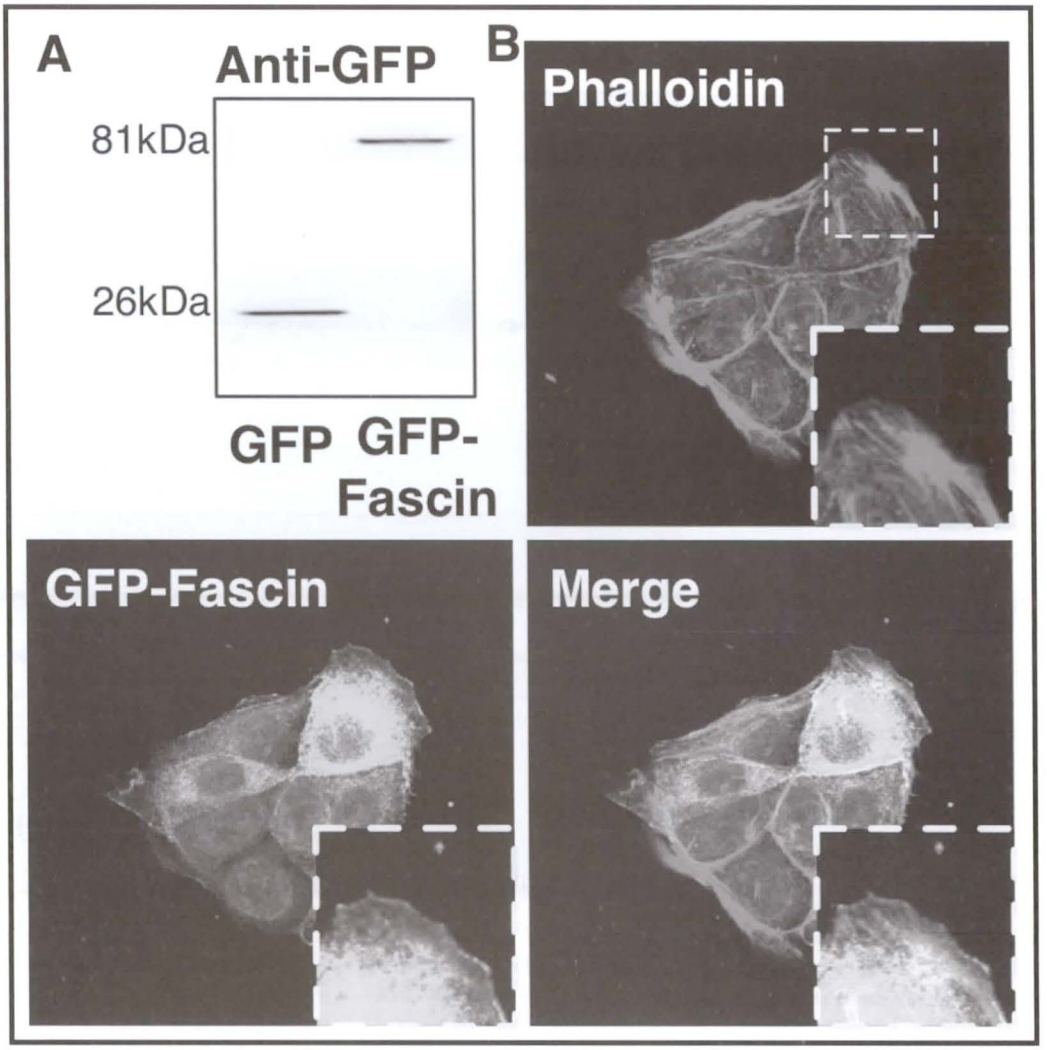
I felt as though I learned and adapted quickly in the lab, and was quite able with regards to carrying out the experiments. In fact, performing the experiments was the best thing about the project and I had a real thrill every time I witnessed something new or attempted a new procedure. The time I obtained my first images was a real joy for me; it felt like I was making real progress. Our findings led us to develop new theories which we tested during the placement: we suspected the strong influence of lactalbumin as a trigger for involution, hypothesising that a build-up within the mammary gland could lead to its own re-uptake and subsequent activation of lysosomal-mediated cell death. Our successive tests gave mixed results and it was difficult to conclude with any certainty, but some promising findings had been made. To finish, I had the opportunity to try my hand at some cell culture experiments which required greater care and fortunately led me to observe some of my finest images when we probed to see how actin played a part in the death of Oncostatin-M treated cell populations. I'd like to thank Professor Watson and her team for offering me the position and for taking such good care of me this past summer, as well as the BSCB for their support without which this placement could not have taken place. The experience has certainly inspired me to consider pursuing a career with an element of technical research associated with it.

Vlad Paraoan, Medical Student, Trinity College, Cambridge.



Above left: At my bench (left). Above right: Control mouse, 72h involution.

Facsin, Rac1 and cancer metastasis



My project with Professor Laura Machesky's lab at the Beatson Institute for Cancer Research mainly focused on the roles of two proteins in cancer cell metastasis: fascin, an actin-bundling protein, and Rac1, a Rho family small GTPase.

Fascin is a 55kDa actin bundling protein. Phosphorylation at serine 39 by protein kinase C blocks the actin binding site at the N-terminus of fascin, thereby inhibiting its actin bundling activity (Adams, 2004). Originally extracted from sea urchin coelomocytes, fascin is also found in *Drosophila* as the product of the gene singed. In humans, there are three isoforms of fascin: fascin-1, fascin-2 and fascin-3, expressed in different cell types. Here we look at fascin-1 (fascin), which is expressed in mesenchymal derived cells, such as dendritic cells and neuronal cells.

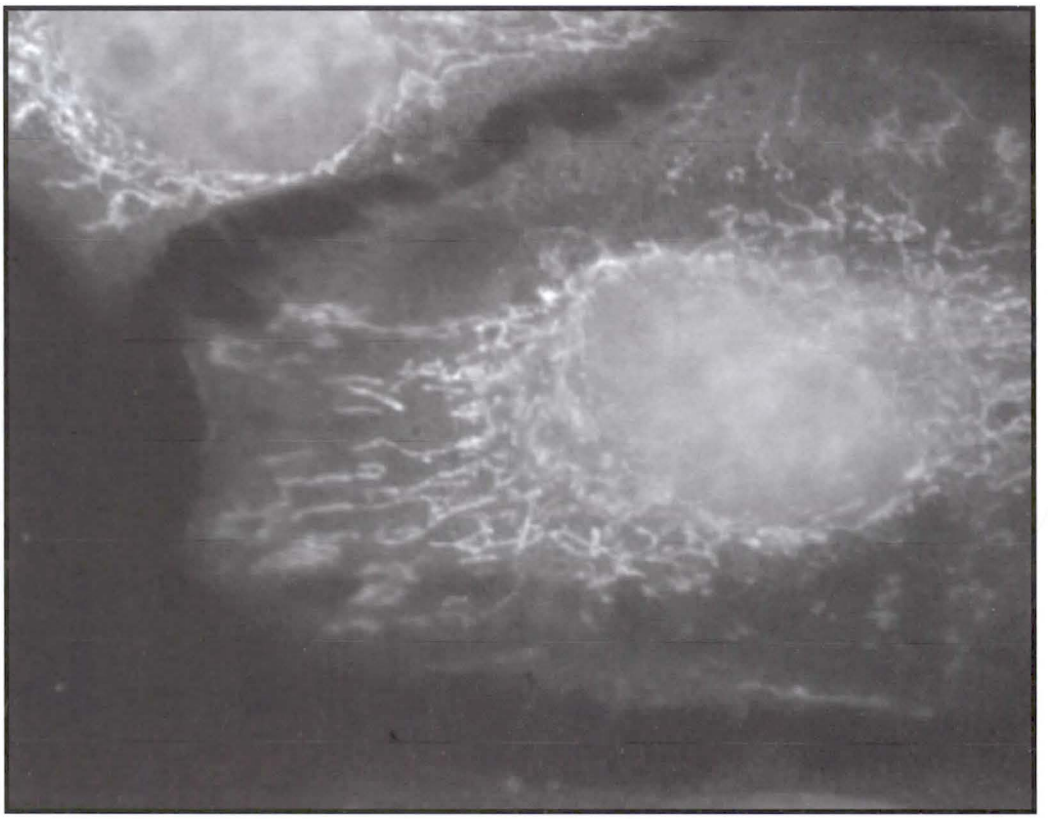
The expression of fascin has been implicated in cancer progression and metastasis in multiple clinical studies. The fact that fascin is not normally expressed in epithelial cells but upregulated as part of the epithelial-to-mesenchymal transition leads us to hypothesise that upregulation of fascin may confer special motility and increased invasiveness on cancer cells. The lab is investigating the role of fascin in metastatic pancreatic ductal adenocarcinoma (PDAC). Stable cell lines expressing GFP or GFP-fascin are established using PDAC cells from fascin knockout mice. The first task in my project was to observe the general cell morphology and localisation of fascin in these cells. Results from my western blot (Fig.1A) first confirmed the absence of fascin in the FG PDAC cells as well as the expression of GFP-fascin in FGF PDAC cells. I then labelled the cells with phalloidin following fixation of both Fascin$^{-/-}$ +GFP (FG) and Fascin$^{-/-}$ +GFP-fascin (FGF) PDAC cells. This enabled me to visualise fascin colocalising with actin at the cell leading edge using confocal microscopy (Fig.1B).

The other part of my project involved investigating the role of Rac1 in the assembly of invadopodia in melanoma cells. Rac1 is a small GTPase that has been shown to be important for cell migration during cancer cell invasion. Once cancer cells become invasive, matrix-degrading protrusions called invadopodia form from the ventral surface of the cell where actin is enriched and extended into the extracellular matrix. We wanted to test whether Rac1 is required for matrix degradation in cancer cells using invadopodia. To achieve this, I spread wildtype and Rac1 knockout melanoma cells, previously isolated from mice carrying metastatic melanoma, over Alexa488 labelled gelatin-coated coverslips. The cells were fixed and stained after incubation overnight with phalloidin. I then quantified the area of degradation and found a significant decrease in the area of degradation by Rac1 knockout melanoma cells.

Finally, I would like to thank Professor Laura Machesky for giving me the opportunity to work in her lab, Dr. Ang Li for his patience in demonstrating technical details as well as his supervision, and BSCB who funded my 8-week project. It has been a real pleasure for me working in a world-class laboratory with the lab members who inspired me with their work.

Meng Jin, Biochemistry undergraduate,
Imperial College London

Alternative initiation codons lead to multiple, differentially localised isoforms of an RNA-binding protein



This summer I had the opportunity to work for 7 weeks in Dr. Mark Coldwell's lab at the University of Southampton. The MJC lab is interested in eukaryotic post-transcriptional control and especially in the initiation of translation. One project in which they are currently involved is an investigation into alternative (non-AUG and hence not previously annotated) initiation codons that have gone undetected in in the 5' UTRs of some genes, hence leading to N-terminally extended open reading frames. This has shown the existence of previously unidentified isoforms of proteins with potentially novel localisations and functions within the cell.

The lab here has identified a number of gene candidates in which an extended open reading frame has been found to exist within the 5' UTR of the mRNA by virtue of initiation from an alternative non-AUG codon/s. One promising example is an RNA binding, nuclear protein. The aim of my project was to continue the study of this protein, building on research carried out last year by a previous undergraduate student.

It had previously been shown that a triple-FLAG (3F) tagged wild-type variant of our protein of interest with the full extended open-reading frame (eORF) produced 3 bands on a Western blot. The higher and lower bands were interpreted as representing the GUG and AUG initiated isotypes respectively with the middle band representing the extended isotype with a putative signal peptide cleaved away. I performed mutagenic PCRs to create similar variants with GUG to AUG and GUG to UAC mutations as well as a shortened transcript without the eORF. These were cloned into a 3F vector and the recombinant plasmids transformed into competent *E.coli*. Colonies were cultured before extraction and purification of the plasmid DNA.

The purified plasmids were transfected into HeLa cells and whole cell extract was harvested and Western blotted. It was anticipated that the 2 higher bands would be found in the GUG to AUG mutant lane and the single lower band in both the GUG to UAC and shortened transcript lanes. In reality however only the highest band was found in the GUG to AUG lane suggesting that the signal peptide was not being cleaved and the 2 lower bands were found in the GUG to UAC lane. This suggested the existence of a third isotype with initiation occurring between the alternative GUG and the annotated AUG initiation codons. There is indeed an in-frame CUG codon between the GUG and the AUG and it now appears that this is also an active initiation codon; a possibility that I will be exploring further as part of my 3rd year project.

Immunofluorescence allowed me to gain an initial idea as to the possible alternative localisations of the longer isoforms of what was formerly believed to be a solely nuclear protein. HeLa cells transfected with a plasmid expressing all three isoforms of the protein are shown opposite with the DAPI stained nuclei in blue and the fluorophore tagged protein in red. It can be clearly seen that the tagged isotypes are localised to both the nucleus and what appears to be the ER in the transfected cells. It is supposed that it is the longer form encompassing the putative signal peptide that is ER localised though this is yet to be conclusively demonstrated. What this novel localisation means for the role of this new variant of the protein is an exciting focus for future experiments. The BSCB summer project will also lead on to work where we intend to perform live cell imaging using SNAP/CLIP tags instead of the 3F tag, and this will be the focus of my third year project

Over the course of my project I had the opportunity to learn and practice a number of core biochemical techniques including PCR, the use of restriction enzymes, DNA purification, transfection, human cell line use and maintenance in a tissue culture facility, protein harvest, Western blotting and immunofluorescence. I feel myself to be well placed for my third year undergraduate project and for possible further research based study in the future. I would like to thank the BSCB for funding this project; my supervisor Dr. Mark Coldwell for his time, support and teaching and Dr. Jo Cowan and Lisa Perry for their help and patience!

Michael Allwright, Undergraduate, Centre for Biological Sciences, The University of Southampton, UK

28

What defines the 'alternatively activated' phenotype of mononuclear phagocytes?

This summer, I had the opportunity to work in Dr Adrian Mountford's lab in the Centre for Immunology and Infection at the University of York. The Mountford lab studies the pathology of *S. mansoni*, one of the main schistosomes that infect humans. *S. mansoni* causes intestinal and hepatic schistosomasis and is found in Africa, South America and the Arabian Peninsula [1]. The cercarial larval stage releases material upon infection that modulates the activation of phagocytes; the products secreted in the first 3 hours post transformation (0-3hRP) have been shown to stimulate 'alternative' – as opposed to 'classical' – activation of macrophages [2]. The aim of this project is to investigate changes in expression of membrane proteins between alternatively and classically activated macrophages using LC-MS/MS, this could lead to the identification of markers that are specific to the alternative activation phenotype.

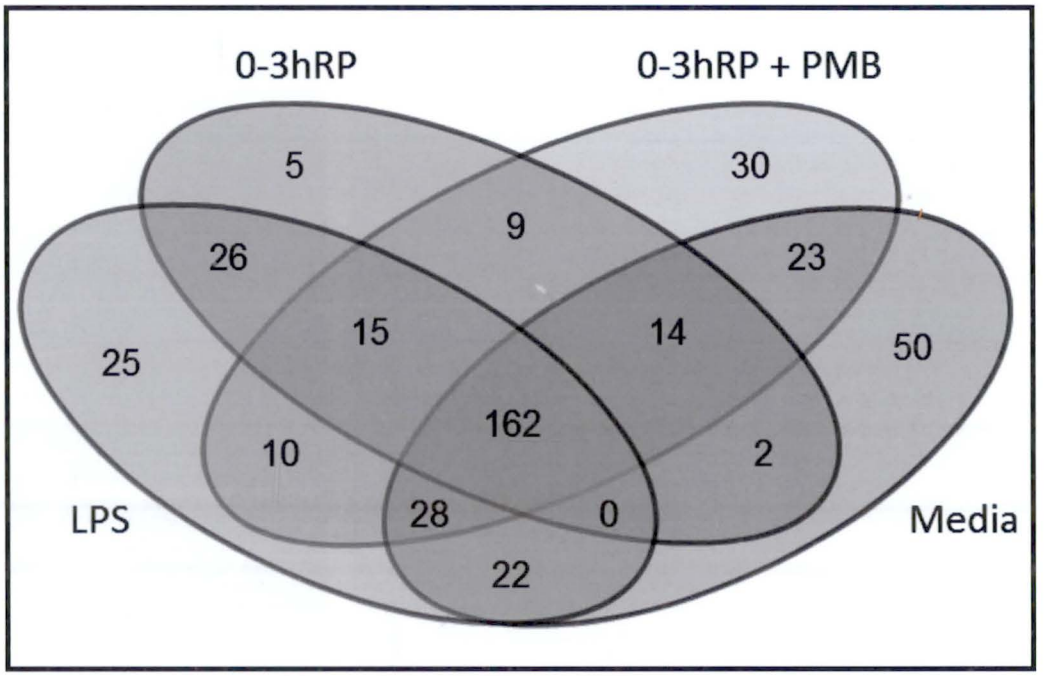
The first stage of the project was to produce alternatively activated macrophages in vitro; to do this we generated bone marrow derived macrophages (BMMϕ) from mice and incubated them with 0-3hRP overnight. We also incubated BMMϕ with LPS to produce classically activated macrophages, 0-3hRP with polymyxin B (PBM) to remove any potential endotoxin contamination of the 0-3hRP, and medium only as a negative control. Flow cytometry was employed to ensure that macrophages had been produced and to look at the activation status of the cells. Cytokine production of each cell culture was analysed by ELISA, IL-10 and IL-12 levels were measured to investigate the response mounted against each stimulant.

After successfully producing alternatively activated macrophages the aim was to obtain and purify the plasma membranes of the cells. This was achieved using sequential sonication and centrifugation steps to disrupt the membranes and selectively remove unwanted fractions. The membrane rich fractions of macrophages stimulated with 0-3hRP, 0-3hRP with PMB, LPS, and medium were then analysed by LC-MS/MS.

A total of 421 proteins were identified using this method, with 162 common to all four samples. There were 15 proteins unique to the activated cell cultures (those stimulated with LPS, 0-3hRP and 0-3hRP + PMB), some interesting findings include Tapbp, Icam1, Msr1 and Irg1 which all play roles in the immune system and appear to be up regulated upon activation of the cell. As for proteins that could be potential markers for alternative activation, there were 9 proteins common to the cultures stimulated with 0-3hRP. One of these, Lgals3bp, has been implicated in immune system response and could be up regulated in alternatively activated macrophages; obviously further study is required to investigate this. Since leaving the lab the membrane rich fractions have been subject to additional runs to allow quantification, the data of which is currently being analysed.

I would like to thank Dr Mountford for the amazing opportunity to work in his lab, and the chance to gain skills and techniques that will be essential to my future career in biochemistry. Cat Prendergast, Claire Bourke and David Sanin deserve special thanks for their invaluable guidance and support. It has been an exciting and interesting 8 weeks that would not have been possible without funding from the BSCB, for which I am very grateful.

James Chamberlain
Biochemistry Undergraduate
University of York



Above: Venn diagram showing the distribution of proteins identified by LC-MS/MS.

Gryseels B, Polman K, Clerinx J, Kestens L. 2006. Human Schistosomiasis. Lancet; 368:1106–1118.

Paveley, R. A., Aynsley, S.A., Cook, P.C., Turner, J.D. and Mountford, A.P. 2009. Fluorescent imaging of antigen released by a skin-invading helminth reveals differential uptake and activation profiles by antigen presenting cells. PLoS Neglected Tropical Diseases 3 e528.

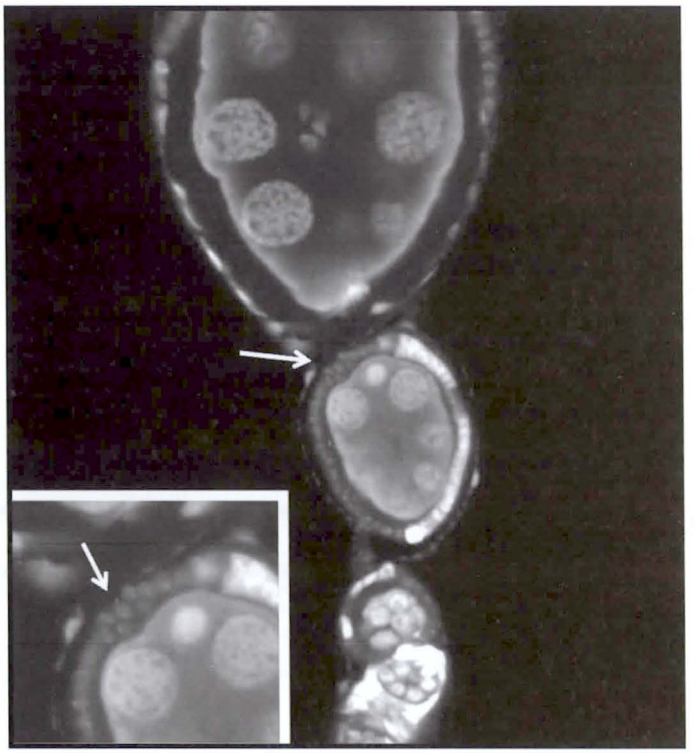
Investigating the role of the Salvador-Warts-Hippo pathway in tissue architecture

The key components of the Salvador-Warts-Hippo (SWH) tumour suppressor pathway include the kinases Hippo and Warts, the scaffold protein Salvador and the transcriptional co-activator Yorkie. Disruption of the SWH pathway promotes excess proliferation and apoptotic defects. This pathway also regulates mitotic spindle orientation in epithelial cells.

In addition to the regulation of cell proliferation and differentiation, Hippo also appears to regulate tissue architecture. Importantly, a connection between spindle misalignment and cancer has recently been established. Therefore an intriguing possibility is that Hippo affects tissue architecture through specifically regulating spindle orientation, and thus has a key role in suppressing tumour formation. Crucially, although the SWH pathway was first identified in *Drosophila melanogaster*, it has since been shown to be evolutionarily conserved. Therefore, what makes the *Drosophila* SWH pathway an important area to investigate is the increasing evidence that deregulation of the analogous human pathway is implicated in tumourigenesis of human cancers.

During the past summer, I had the opportunity to work on various aspects of the SWH pathway in Isabel Palacios' lab at the Department of Zoology, University of Cambridge. Using the egg chamber of *Drosophila* melanogaster as a model system, I learned how to take care of stocks, select virgins and maintain crosses to obtain flies mutated in various SWH pathway components. I then dissected the ovaries to reveal bead-like strings of *Drosophila* egg chambers in progressive stages of oogenesis. In wild type flies, a monolayer of follicle cells (FCs) forms a polarised epithelium around an egg chamber and FCs undergo a switch from mitosis into an endocycle at stage 6 of oogenesis. In striking contrast, hippo mutant (anterior and posterior) FCs inappropriately remain in mitosis after stage 6 and are characterised by the misorientation of the mitotic spindle in a bi- or multilayered epithelium. Interestingly, α-spectrin mutant posterior FC (PFC) clones also form a multilayered epithelium, thus potentially suggesting that Hippo may regulate spindle orientation via the spectrin-based membrane cytoskeleton, responsible for maintaining epithelial structure. Spindle orientation is also affected in α-spectrin mutants (Palacios lab, unpublished). Thus the goals of the project were to investigate how the SWH pathway regulates spindle orientation of PFCs and more specifically to compare the hippo mutant phenotype to the α-spectrin mutant phenotype.

To this end, I used both live imaging and immunostained samples. The MARCM (Mosaic Analysis with a Repressible Cell Marker) and FLP/FRT systems allowed generation of GFP positive and negative posterior mutant cells, respectively, which could be identified using confocal microscopy. I generated α-spectrin mutant PFCs (GFP negative, Figure 1) and the results confirm earlier work done by the lab using a slightly different system. Unlike hippo mutant PFCs, which remain undifferentiated, α-spectrin mutant cells express a differentiation marker in the layer of PFCs in contact with the oocyte (the first layer), but not in the second layer. This suggests that in contrast to hippo mutants, the first α-spectrin PFC layer is able to differentiate. Also unlike hippo mutant cells, which continue dividing after stage 6, α-spectrin PFCs do not divide after stage 6. This suggests that the α-spectrin mutation, although responsible for defects in epithelial architecture, does not show defects in proliferation.



Above: α-spectrin mutant PFCs show bilayer formation in *Drosophila* egg chambers, as shown by the arrow. The box shows a close-up of the bilayer. Mutants are identified by lack of GFP (green), wild-type cells are GFP positive and DNA is stained using DAPI (blue).

This summer project represented my very first opportunity to work with flies and microscopes. It reinforced both my goal of pursuing postgraduate studies in biology and the realisation that although a lot of the time in science things don't quite work out in the way one expects or hopes, when something interesting does occur- or an experiment works- there is no other feeling quite like it. I would like to thank both the Palacios lab and the BSCB for this experience.

Johanna Syrjanen,
University of Cambridge

The consequences of palindrome induced DNA double-strand break repair on chromosome segregation in *Escherichia coli*

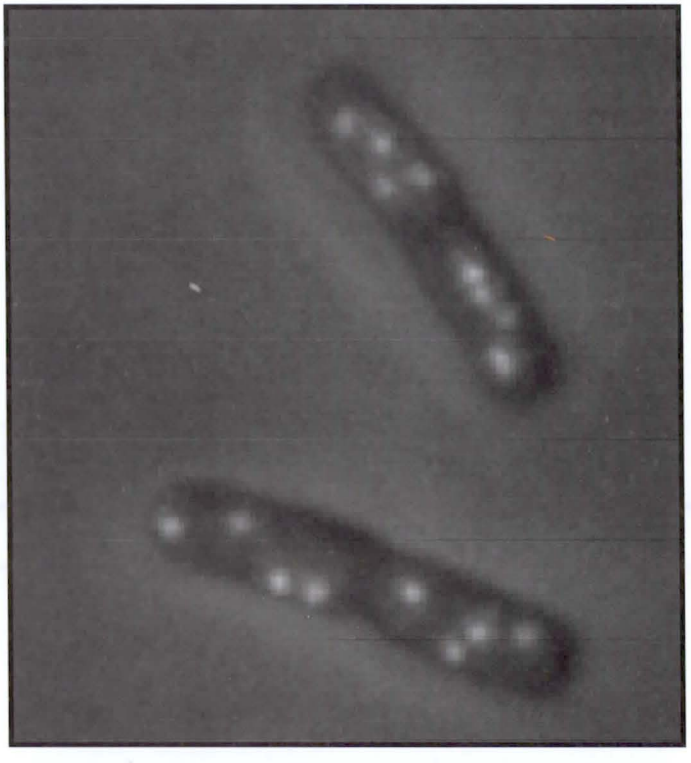
Palindromes are sites of genomic instability in all organisms, both eukaryotic and prokaryotic, and therefore a subject of specific interest due to their association with cancer and recurrent chromosome translocations. In *E.coli* palindromes are cleaved by the SbcCD endonuclease complex and then the newly formed double strand break (DSB) is repaired by homologous recombination to prevent genetic material losses or rearrangements [1,2]. During my summer internship I had the opportunity to work in the Leach laboratory at the Institute of Cell Biology of the University of Edinburgh, which is interested in palindromes and DSB repair in the model organism *E.coli*.

Before I began my project, the Leach Laboratory had developed an elegant genetic construct for inducing a site-specific DSB, once per replication cycle. It was used to show that this single DSB was sufficient to induce the DNA damage response ('SOS response') and temporarily inhibit cell division (unpublished results). An interrupted palindrome introduced to the *E.coli* strain in lacZ locus forms a hairpin that is cleaved by SbcCD when replicated. The PBAD arabinose inducible promoter was introduced to control the expression of the SbcCD complex. The lacZ locus is visualised indirectly by flanking the DSB site on the sides by an array of tetO sites and an array of lacO sites respectively, in *E.coli* strains expressing the fluorescent fusion proteins: TetR-Ypet and LacI-cerulean [1,3].

The aim of my summer project was to investigate whether or not induction of this DSB had any impact on chromosome segregation. The experiments were conducted on two bacterial strains – one strain with a palindrome and another lacking it. After induction of the DSB, bacteria were examined under the fluorescence microscope to acquire pictures for further analysis with software to quantify the position and number of foci in cells.

I am convinced that this summer internship helped me immensely with pursuing a career in biology research, taught me patience and persistence and it also made me even more interested in biology. It was especially interesting because, apart from the "normal" bench lab work, I gained experience in fluorescence microscopy and image processing. I would like to thank Professor David Leach for letting me work in the lab, Dr. Martin White for direct supervision and BSCB for the funding. I am very grateful and I am sure to recommend participating to anyone studying undergraduate biology – it is an invaluable opportunity to get some first-hand experience and a feel of what interests them in biology.

Anna Dowbaj



Above: *E. coli* cells segregating lacO and tetO sites surrounding lacZ; labelled with TetR-Ypet and LacI-cerulean

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3. White, M. A., Eykelenboom, J. E., Lopez-Vernaza, Wilson, E. and Leach, D. R. F. (2008). Non-random Segregation of Sister Chromosomes in Escherichia coli. Nature 455: 1248-12.

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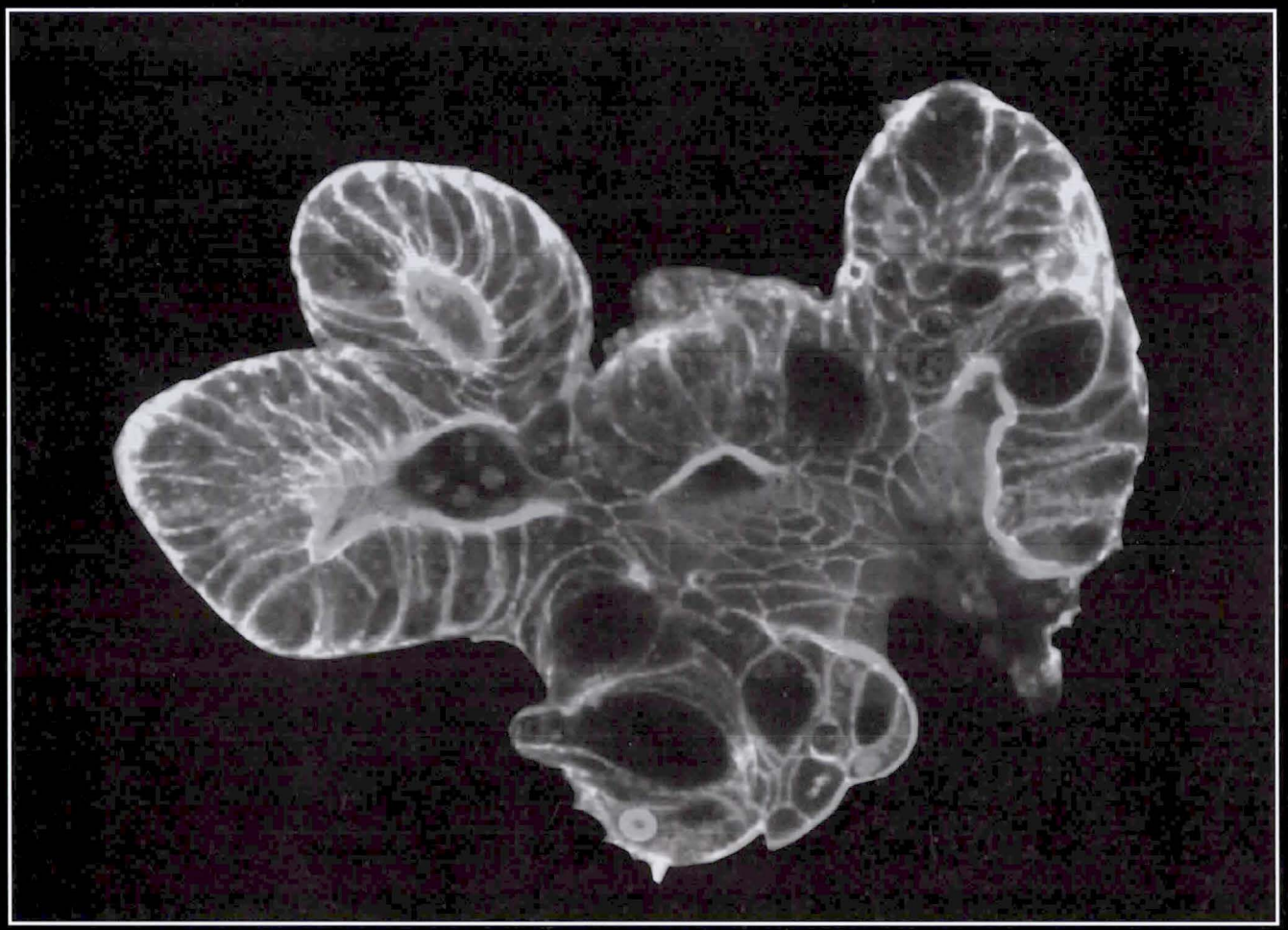

Membrane Dynamics in Cancer

Sunday 1 July – Wednesday 4 July 2012, Glasgow, Scotland

Speakers and Sessions:

Keynote Address: Pier Paolo Di Fiore (IT)

Autophagy: Ivan Dikic (DE), Terje Johansen (NO), Christian Münz (CH), Sharon Tooze (UK), Tamotsu Yoshimori (JP)

Imaging: Philippe Bastiaens (DE), Judith Klumperman (NL), Jennifer Lippincott-Schwartz (US), Tony Ng (UK), David Sherwood (US)

Endocytosis, Signalling and Cell Migration: Alexandre Benmerah (FR), Reinhard Fässler (DE), James Goldenring (US), Johanna Ivaska (FI), Miguel del Pozo (ES), Hisataka Sabe (JP), Sandy Simon (US), Alexander Sorkin (US), Harald Stenmark (NO)

Exosomes and Lysosome Function in Cancer: Norma Andrews (US), Crislyn D'Souza-Schorey (US), Marja Jäättelä (DK), David Lyden (US), Clotilde Thery (FR)

Aims of the Conference:

It is now clear that intracellular membrane trafficking contributes to processes which are linked to cancer. The aim of the conference is to discuss the role of membrane transport in cellular processes such as autophagy, cell migration, receptor signalling, lysosome exocytosis and exosome release in the context of their effects on tumour growth, survival and metastasis. We have assembled a programme of speakers who are leaders in particular aspects of these timely topics, with the intention of exploring new avenues for future collaborative research involving centres throughout the world.

Short talks will be granted to the authors of outstanding abstracts. Some financial assistance will be available to the presenters of these talks through sponsorship from the Association for International Cancer Research.

Website, on-line registration, payment and abstract submission instructions: http://www.beatson.gla.ac.uk/conf

For additional information please contact:
Conference Administrator, Beatson Institute for Cancer Research, Garscube Estate, Switchback Road, Bearsden, Glasgow, G61 1BD, UK

Tel: +44(0) 141 330 3953 Fax: +44(0) 141 942 6521

Email: conference@beatson.gla.ac.uk

Deadline for registration, payment and abstract submission: Monday 7 May 2012

the Beatson institute for cancer research

AICR *Cancer knows no boundaries. Fortunately, neither do we.*

CANCER RESEARCH 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.

The following rules apply:

- 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.
- Members who are based outside of the UK **can only** receive funds to attend BSCB-sponsored meetings in the UK.
- **No lab may receive more than £1000 per calendar year.** ***Awards are discretionary and subject to available funds***

All applications must contain the following:

- the completed and signed application form (below)
- a copy of the abstract being presented
- a copy of the completed meeting registration form
- **proof of registration, travel and any other costs claimed**
  (See additional comments at foot of page)

Applications should be sent to:

Ewald Hettema
Dept. of Molecular Biology and Biotechnology
University of Sheffield
Firth Court, Western Bank, Sheffield S10 2TN

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

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I have been a member for years

Years of previous Honor Fell /COBTravel Awards:

Degree(s) (dates):

Present Position:

Meeting for which application is made:
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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.

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:

Applicant's Signature:

Name:

$ > 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.

Have you included all the necessary information/documentation in support of your application?

Committee Members 2012

President
Professor Jordan Raff
Sir William Dunn School of Pathology
University of Oxford
South Parks Road
Oxford OX1 3RE
Tel: +44 (0) 1865 275533
Email: jordan.raff@path.ox.ac.uk

Secretary
Dr Grant Wheeler
School of Biological Sciences
The University of East Anglia
Norwich NR4 7TJ
Tel: +44 (0) 1603 593988
Email: grant.wheeler@uea.ac.uk

Treasurer
Professor Adrian Harwood
Cardiff School of Biosciences
Biomedical Building
Museum Avenue
Cardiff CF10 3AX
Tel: +44 (0) 29 879358
Email: harwoodaj@cardiff.ac.uk

Meetings Secretary
Dr Andrew McAinsh
Centre for Mechanochemical Cell Biology
Warwick Medical School
The University of Warwick
Coventry, CV4 7AL
Tel: +44 (0) 2476 151167
Email:andrew@mechanochemistry.org

Membership Secretary
Professor Dan Cutler
MRC Laboratory for Molecular Cell Biology
University College London
Gower Street
London
WC1E 6BT
Tel: +44 (0) 20 7679 7806
Email: d.cutler@ucl.ac.uk

Newsletter editor
Dr Kate Nobes
School of Biochemistry
University of Bristol,
Medical Sciences Building
University Walk,
Bristol BS8 1TD
Tel: +44 (0) 117 331 2229
Email:
catherine.nobes@bristol.ac.uk
(to whom material should be sent
– see guidelines for contributors)

Website Coordinator
Dr Paul. D. Andrews
Cellartis AB 1
Wurzburg Court
Dundee DD2 1FB
Tel: +44 (0) 1382 569987
Email: pdandrews1@mac.com

Sponsorship secretary
Dr Richard Grose
Centre for Tumour Biology
Institute of Cancer and the CR-UK Clinical Centre
Barts and The London School of Medicine and Dentistry
Ground Floor, John Vane Science Centre
Charterhouse Square
London EC1M 6BQ
Tel +44 (0)207 014 0415
Email: r.p.grose@qmul.ac.uk

Honor fell/COB Travel Award Secretary
Dr Ewald Hettema
Dept of Molecular Biology and Biotechnology
University of Sheffield
Firth Court, Western Bank
Sheffield S10 2TN
Tel: +44 (0)114 222 273
Email:
e.hettema@sheffield.ac.uk

Committee members

Dr Buzz Baum
MRC Laboratory of Molecular Cell Biology
University College London
Tel: +44 (0)20 7679 3040
Email: b.baum@ucl.ac.uk

Professor Iain Hagan
Department of Biochemistry and Applied Molecular Biology
University of Manchester, and
Cell Division Group
Paterson Institute for Cancer Research
Christie Hospital
Wilmslow Road
Withington
Manchester M20 4BX
Email: ihagan@picr.man.ac.uk

Professor Patrick Hussey
School of Biological and Biomedical Sciences
Durham University
Email: p.j.hussey@durham.ac.uk

Dr Jean-Paul Vincent
MRC National Institute for Medical Research
The Ridgeway,
Mill Hill,
London NW7 1AA
Email: jvincen@nimr.mrc.ac.uk

Dr Caroline Austin
Institute for Cell and Molecular Biosciences
The Medical School
University of Newcastle upon Tyne
Framlington Place
Newcastle upon Tyne NE2 4HH
Email:
Caroline.Austin@ncl.ac.uk

Dr Steve Royle
The Physiological Laboratory,
School of Biomedical Sciences,
Crown Street,
University of Liverpool,
Liverpool L69 3BX
Email: s.j.royle@liv.ac.uk

Non-elected (co-opted) members

PhD student rep
Kimberley Bryon
MRC Laboratory of Molecular Cell Biology
University College London
Tel: +44 (0)20 7679
Email:
kimberley.bryon.09@ucl.ac.uk

Postdoc rep
Dr Iman van den Bout,
Paterson Institute for Cancer Research
The University of Manchester
Wilmslow Road
Manchester M20 4BX
Email:
IVBout@picr.man.ac.uk

BSCB assistant
Margaret Clements
BSCB Assistant
The Company of Biologists Ltd.
140 Cowley Road
Cambridge CB4 0DL
Email admin@bscb.org

Schools Liaison Officer
David Archer
43 Lindsay Gardens,
St. Andrews,
Fife, KY16 8XD
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Cardiff	Morris Hallet, Adrian Harwood	hallettmb@cf.ac.uk, HarwoodAJ@cf.ac.uk
Clare Hall	Simon Boulton	simon.boulton@cancer.org.uk
Dundee	Angus Lamond, Inke Nathke	a.i.lamond@dundee.ac.uk, i.s.nathke@dundee.ac.uk
Durham	Roy Quinlan	r.a.quinlan@durham.ac.uk
Edinburgh	Bill Earnshaw, Ian Chambers	Bill.Earnshaw@ed.ac.uk, ichambers@ed.ac.uk
	Margarete Heck, Wendy Bickmore	margarete.heck@ed.ac.uk, W.Bickmore@hgu.mrc.ac.uk
Glasgow	Nia Bryant, Karen Vousden	n.bryant@bio.gla.ac.uk, k.vousden@beatson.gla.ac.uk
Hull	Klaus Ersfeld	k.ersfeld@hull.ac.uk
ICR	Clare Isacke	clare.isacke@icr.ac.uk
Imperial	Vania Braga, Mandy Fisher	v.braga@ic.ac.uk, amanda.fisher@csc.mrc.ac.uk
Kings/Guys	Simon Hughes	s.hughes@kcl.ac.uk
Leeds	Michelle Peckham	m.peckham@leeds.ac.uk
Leicester	Andrew Fry, Colin Ockleford	amf5@leicester.ac.uk, c.ockleford@leicester.ac.uk
LIF	Giampietro Schiavo	giampietro.schiavo@cancer.org.uk
Liverpool	Daimark Bennett, Sylvie Urbe	daimark.bennett@liv.ac.uk, urbe@liv.ac.uk
Ludwig	Anne Ridley	anne.ridley@kcl.ac.uk
Manchester	Charles Streuli, Iain Hagan	charles.streuli@man.ac.uk, IHagan@PICR.man.ac.uk
	Viki Allan	Viki.Allan@manchester.ac.uk
Newcastle	Michael Whittaker	michael.whitaker@newcastle.ac.uk
NIMR	Peter Rosenthal, Jean-Paul Vincent	prosent@nimr.mrc.ac.uk, jp.vincent@nimr.mrc.ac.uk
Norwich	Grant Wheeler, Tom Wileman	grant.wheeler@uea.ac.uk, T.Wileman@uea.ac.uk
Nottingham	John Mayer	John.Mayer@nottingham.ac.uk
Oxford	Chris Hawes, James Wakefield	chawes@brookes.ac.uk, james.wakefield@zoo.ox.ac.uk
	Jordan Raff	jordan.raff@path.ox.ac.uk
Queen Mary	Mark Turner	m.d.turner@qmul.ac.uk
Reading	Jonathan Gibbins	j.m.gibbins@reading.ac.uk
Sheffield	Liz Smythe, Andy Grierson	e.smythe@sheffield.ac.uk, a.j.grierson@sheffield.ac.uk
Southampton	Malcolm East, Paul Townsend	j.m.east@soton.ac.uk, P.A.Townsend@soton.ac.uk
	Jane Collins	jec3@soton.ac.uk
St Andrews	Jo Parish	jlp10@st-andrews.ac.uk
St Georges	David Winterbourne	sghk100@sghms.ac.uk
UCL	John Carroll, Patricia Salinas	j.carroll@ucl.ac.uk, p.salinas@ucl.ac.uk
Vet College	Nigel Goode	ngoode@rvc.ac.uk
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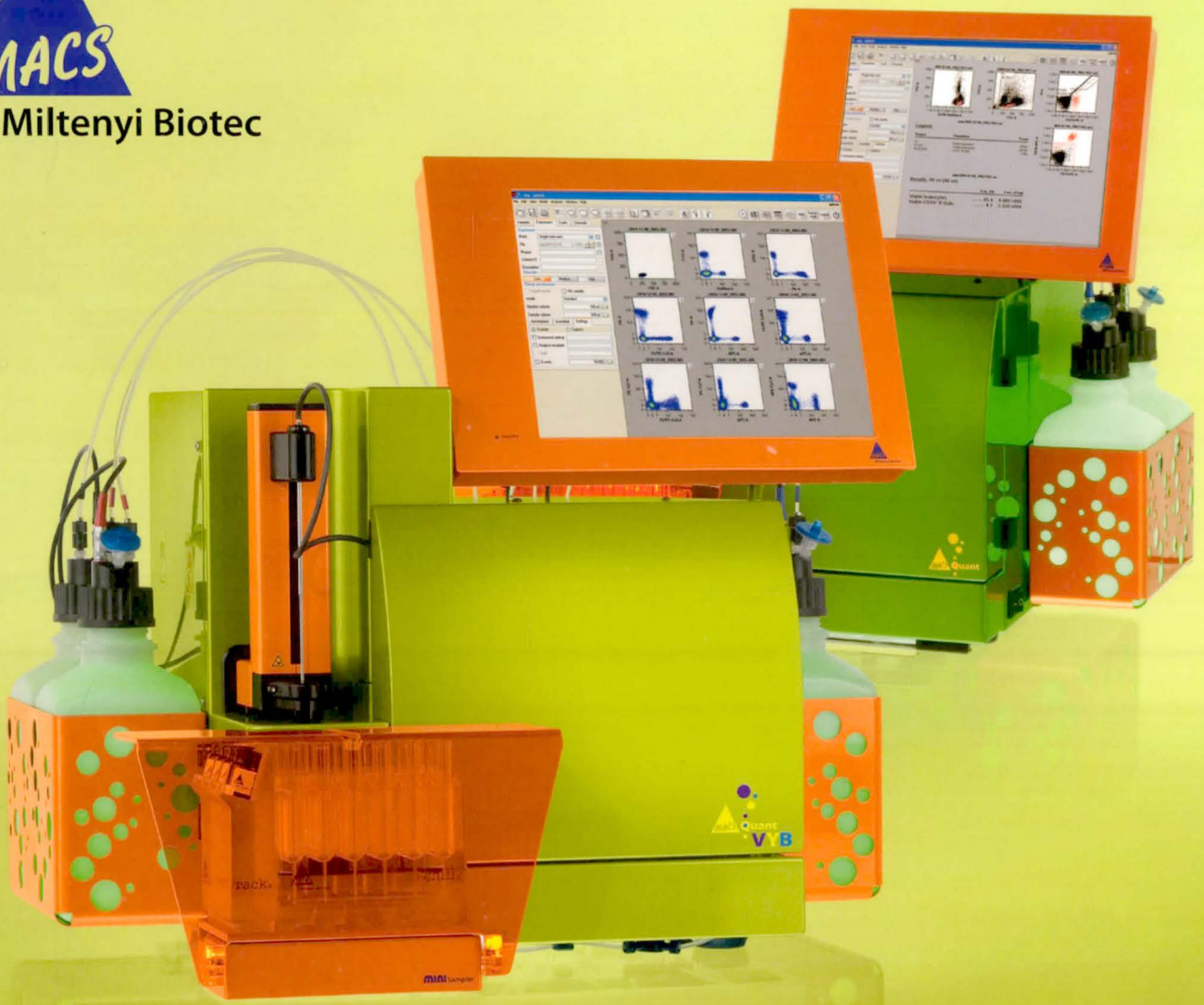

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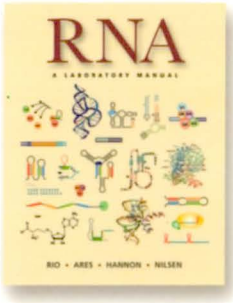

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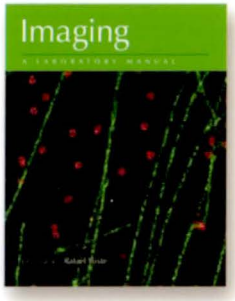

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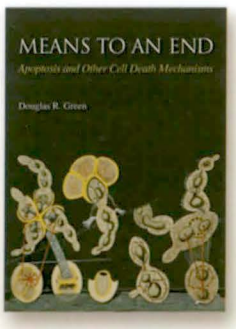

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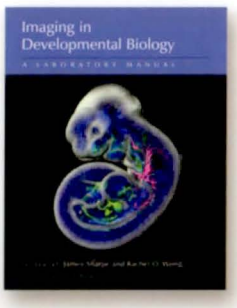

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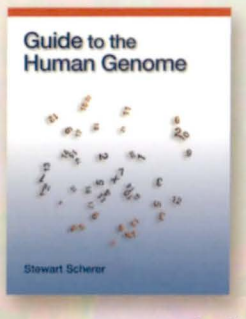

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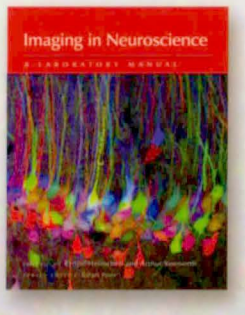

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