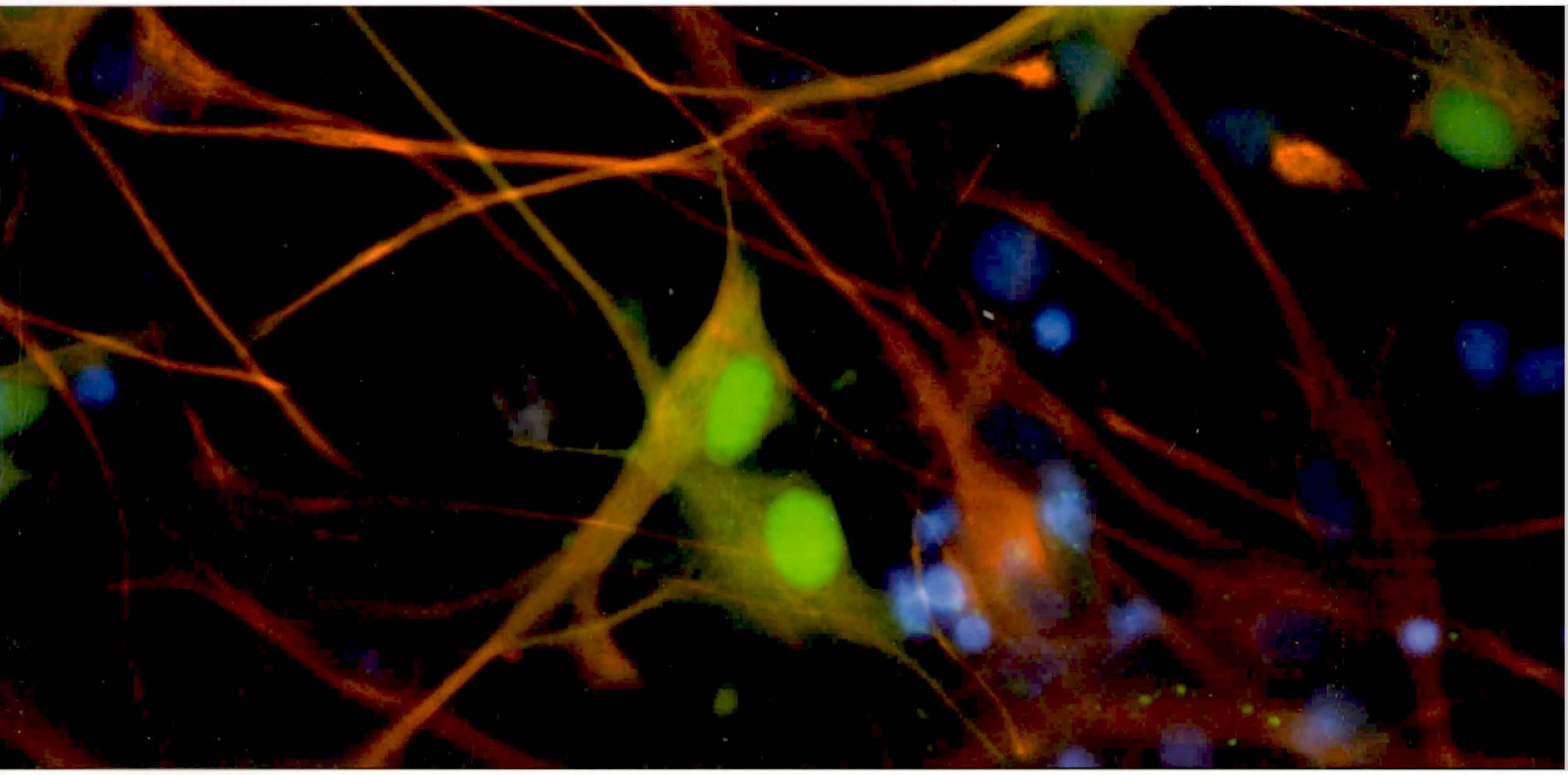

BSCB Newsletter
Summer 2006

British Society for Cell Biology

Imaging Membrane Dynamics:
Visualization of Trafficking Pathways

A joint meeting of the
British Society for Cell Biology
and the
Royal Microscopical Society

Royal Holloway - University of London
14th - 17th September 2006
Organizers: David Stephens and Rainer Duden

Speakers include:
Jennifer Lippincott-Schwartz, Alberto Luini,
Tom Kirchhausen, Judith Klumperman,
Graham Warren, Catherine Rabouille,
Ben Glick, Pete Cullen, Vladimir Gelfand,
Viki Allan, Folma Buss, Ben Nichols,
Tim Levine, Christien Merrifield,
Michael Way, Christoph Thiele, Irina Majoul
Chris Hawes, John Hammer III, Ari Helenius,
Gillian Griffiths, and Rainer Pepperkok

For further information see:
www.bscb.org *or* www.rms.org.uk
Discounts on registration fees will be available
for society members

BSCB Newsletter
Summer 2006

Editorial

This is an exciting time for the BSCB. After welcoming Clare Isacke as the new BSCB President and Liz Smythe as the new Secretary, there has also been a change of editor for the newsletter. I have now taken over this role from Joan Marsh, Joan has put a tremendous amount of effort in to the newsletter and has made a significant contribution to the Society as a whole for which she deserves great thanks.

This issue includes many meeting reports, a testament to the success of the Honor Fell Travel Awards. The benefit to the attendees at these meetings is clear from these reports. The BSCB Spring meeting, held jointly with the British Society for Developmental Biology in York, was a great success and a report from Roger Patient, provided at very short notice, is included. This issue also contains a very interesting collection of book reviews; these are still being handled by Joan, who should be contacted with any queries.

The Newsletter is now archived on the BSCB website (www.bscb.org). The website contains lots of relevant information including details of membership, dates of future meetings, and information on BSCB activities. There is also an education section (softCELL) written by David Archer that provides an introduction to cell biology for all. The whole site is currently undergoing a redesign and a new version will be launched shortly.

We are always on the lookout for your own material to be included in the Newsletter. If you have any news items, features, suggestions for cover images, or meeting announcements that you wish to be included then please contact me directly.
The Editor

Cover: Neural progenitor cells were transfected with a plasmid containing GFP under control of the actin promoter. Following transfection and differentiation, the cells were processed for immunohistochemistry for GFP (green) and BIII tubulin (red). Nuclei were identified using DAPI (blue). Image courtesy of Daniel Webber (Department of Clinical Neuroscience, University of Cambridge). Read Daniel's meeting report from the Society for Neuroscience meeting in Washington on page 15.

News

Features

Book reviews

Meeting reports

Forthcoming meetings

Forms

Society business

Newsletter editor: David Stephens
Production: Giles Newton
Website: www.bscb.org
Printer: Hobbs

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Biology of the Cell

Editor-in-Chief:
H. Beverley Osborne (Rennes)

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Image courtesy of Jan Ellenberg, EMBL, Heidelberg

News

BSCB and Royal Microscopical Society link up

The BSCB and Royal Microscopical Society are combining forces for two of the societies forthcoming meetings. In September, the BSCB Autumn meeting "Imaging membrane dynamics: visualization of trafficking pathways" will take place in Surrey with the RMS handling the administration of the meeting. Among the international list of speakers is the RMS President, Chris Hawes.

Next autumn, the regular Abercrombie Cell Motility meeting Cambridge will also be administered by the RMS. This reflects the overlapping areas of interest of the two societies and their mutual aim to host high quality international meetings. The RMS has undergone a significant face-lift in recent months and continue to develop training courses and meeting that will be of great interest to BSCB members. Further details can be found at www.rms.org.uk

Spring meeting poster prizes

This year's poster prize at the Spring meeting was awarded to Ana Camelo (University of Birmingham) for her poster entitled 'Isolation of distinct mouse bone marrow mesenchymal stem cells with osteogenic potential'. The runners up were Elke Bayha (ISREC, Switzerland) for her poster 'Defined organ-position along the antero-posterior axis in the endoderm' and Nkemcho Ojeh (university of Durham) for her poster 'Regulation of epidermal proliferation and wound re-epithelialization by syndecan-1 and CASK'; they win subscriptions to *Nature Cell Biology* and *Current Biology*, respectively.

2006 Hooke medal lecture

The 2006 Hooke Medal lecture will be given by Dr David Owen of the Cambridge Institute for Medical Research at the joint BSCB / RMS Autumn meeting "Imaging membrane dynamics". David is a very welcome addition to our programme for this meeting and adds to an already excellent list of speakers. See page 31 for details.

Cover images

Do you have any cell biology images of which you are particularly proud? The newsletter provides a great way to display your work to a wide audience. If you would like a chance for you image to be included on the cover of the newsletter then please email it with a short description (either as TIFF or JPEG in CMYK and at high resolution) to David Stephens (david.stephens@bristol.ac.uk)

Journal of Cell Science digitized archive

Journal of Cell Science first appeared under its current title in March 1966 and the 100 volumes published between then and 1992 are now online (from 1992 to the current issue was already available). This initiative has added nearly 50,000 pages of newly digitized material, including many classic papers not previously available to most researchers. Prior to being renamed in 1966, *Journal of Cell Science* was published under the title *Quarterly Journal of Microscopical Science* (QJMS) from 1853 to 1965. These are currently being scanned, and they too will shortly be available online.

Although there has been a considerable investment by The Company Of Biologists Ltd in making this material available, there is no change to the journal's online access policies: all material over 6 months' old is available free of charge to everyone and no subscription is required to view any of the recently created archive.
http://jcs.biologists.org/

New members on the BSCB Committee

Professors Iain Hagan (Paterson Institute, University of Manchester) and Adrian Harwood (University of Cardiff) have joined the BSCB committee.

Contact details for them and the other members of the committee can be found on page 38.

OUP Prize

To celebrate the publication of Research Methods in the Biosciences, Biomeasurement and the new edition of Experimental Design for the Life Sciences, OUP is launching a prize to be awarded to the student in your biosciences department who has achieved the most or shown the greatest improvement in experimental work over the course of the academic year. They hope that this award will encourage students in their study and that £100 of OUP titles will help them to broaden their knowledge and understanding of this subject. The choice of winner is at the discretion of the individual university department, who need only inform us of their decision in time for the prize to be awarded at the end of each academic year. Contact: Sarah.Broadley@oup.com

Schedule Announced

The ASCB 46th Annual Meeting

December 9-13, San Diego, CA

Mary Beckerle, President ■ Anthony Bretscher, Program Chair ■ Arshad Desai, Local Arrangements Chair

KEYNOTE SYMPOSIUM

Saturday, December 9

Frontiers in Cell Biology—6:00 pm

Thomas R. Cech, Howard Hughes Medical Institute

SYMPOSIA

Sunday, December 10

Coordination of Adhesion and Migration—8:00 am

Denise Montell, Johns Hopkins Medical School
Clare Waterman-Storer, The Scripps Research Institute
Kenneth Yamada, National Institute of Dental & Craniofacial Research/NIH

Deciphering Evolution—10:30 am

Sean Carroll, University of Wisconsin–Madison/HHMI
Eric Jarvis, Duke University Medical Center
David Kingsley, Stanford University School of Medicine/HHMI

Monday, December 11

Mechanisms in Mitosis—8:00 am

Rebecca Heald, University of California, Berkeley
Lucille Shapiro, Stanford University School of Medicine
Ronald D. Vale, University of California, San Francisco/HHMI

Developmental Decisions—10:30 am

Hans Clevers, Netherlands Institute for Developmental Biology
Elliot Meyerowitz, California Institute of Technology
Susan Strome, Indiana University

Tuesday, December 12

Membrane Assembly and Dynamics—8:00 am

Gillian Griffiths, University of Oxford
Janet Shaw, University of Utah
Marino Zerial, Max Planck Institute of Molecular Cell Biology & Genetics

From Cellular Mechanisms to Therapeutic Intervention—10:30 am

Susan Lindquist, Whitehead Institute for Biomedical Research
Christine Seidman, Harvard Medical School/HHMI
Xiaodong Wang, University of Texas Southwestern Medical Center/HHMI

Wednesday, December 13

Functional Networks—8:00 am

Susan Mango, University of Utah
Kevan Shokat, University of California, San Francisco
Tian Xu, Yale University School of Medicine/HHMI

Stem Cell Biology—10:30 am

George Q. Daley, Children's Hospital Boston
Elaine Fuchs, Rockefeller University/HHMI
Margaret Fuller, Stanford University School of Medicine

MINISYMPOSIA

Apoptosis
Eileen White, Rutgers University
Junying Yuan, Harvard Medical School

Applications of Biosensors
Atsushi Miyawaki, RIKEN Brain Science Institute
Alice Ting, Massachusetts Institute of Technology

Cancer Mechanisms
Lisa Maria Coussens, University of California, San Francisco
Mary J.C. Hendrix, Children's Memorial Research Center/Northwestern University Feinberg School of Medicine

Cell Cycle
Mary Dasso, National Institute of Child Health & Human Development/NIH
Jonathon Pines, The Wellcome Trust/Cancer Research UK

Cell Migration
Diane L. Barber, University of California, San Francisco
Gregg G. Gundersen, Columbia University College of Physicians & Surgeons

Computational Applications in Cell Biology
Douglas A. Lauffenberger, Massachusetts Institute of Technology
Alex Mogilner, University of California, Davis

Cytoskeleton, Adhesion and Disease
Kathleen J. Green, Northwestern University Feinberg School of Medicine
Alpha S.K. Yap, University of Queensland

ECM and Cell Signaling
Jean E. Schwarzbauer, Princeton University
Christopher Turner, SUNY Upstate Medical University

Endo- and Exocytosis
Todd Graham, Vanderbilt University
Margaret Scott Robinson, CIMB/The Wellcome Trust

Epigenetics and Chromatin Remodeling
Peggy Farnham, University of California, Davis
Andrew Feinberg, Johns Hopkins University School of Medicine

Epithelial Organization and Morphogenesis
Andrea I. McClatchey, Massachusetts General Hospital
Ulrich Tepass, University of Toronto

GTPases in Cellular Traffic
Francis Barr, Max Planck Institute of Biochemistry
Shou-ou Shan, California Institute of Technology

Host Pathogen Interactions
Jorge Galan, Yale University School of Medicine
Francoise Gisou Van Der Goot, University of Geneva Medical School

Imaging
J. Richard McIntosh, University of Colorado
Eva Nogales, University of California, Berkeley/HHMI

Immune Cell Adhesion and Recognition
Andrey Shaw, Washington University School of Medicine
Colin Watts, University of Dundee

Intermediate Filaments and Disease
Don W. Cleveland, University of California, San Diego
Colin Stewart, NCI-Frederick

Kinetochores and Centrosomes
Michel L.F. Bornens, Institute Curie, Paris
Peter Todd Stukenberg, University of Virginia School of Medicine

Life at the Microtubule Plus End
Anna Akhmanova, Erasmus University
Kevin Vaughan, University of Notre Dame

Mechanisms of Actin Dynamics
Bruce Lane Goode, Brandeis University
Dorit Hanein, The Burnham Institute

Mechanisms of Cell Polarity
Patrick Brennwald, University of North Carolina at Chapel Hill
Chris Q. Doe, University of Oregon/HHMI

Membrane Traffic in Disease
Esteban Carlos Dell-Angelica, University of California, Los Angeles School of Medicine
Daniel Klionsky, University of Michigan

Microtubule Motors
Erika L.F. Holzbaur, University of Pennsylvania
Claire E. Walczak, Indiana University

Motile and Sensory Cilia
Kathryn Anderson, Memorial Sloan-Kettering Cancer Center
Elizabeth F. Smith, Dartmouth College

Myosin-based Movement
Folma Buss, Cambridge University
Arturo DeLozanne, University of Texas

Neural Degeneration and Regeneration
Zhigang He, Harvard University
Stephen Strittmatter, Yale University School of Medicine

Nuclear Pore and Traffic
Michael P. Rout, Rockefeller University
Katherine S. Ullman, University of Utah

Organelle Inheritance and Maintenance
Liza A. Pon, Columbia University College of Physicians & Surgeons
Michael Schrader, University of Marburg

Regulation of the Cytoskeleton
Keith W.T. Burridge, University of North Carolina at Chapel Hill
Anne J. Ridley, Ludwig Institute for Cancer Research

RNA and Development
Oliver Hobert, Columbia University College of Physicians & Surgeons/HHMI
Roy Parker, University of Arizona/HHMI

Signaling in Development
Marcos Gonzalez-Gaitan, Max Planck Institute of Molecular Cell Biology & Genetics
Alexandra Joyner, New York University School of Medicine/HHMI

Stem Cells
M. Kathryn Barton, Carnegie Institution of Washington
Linheng Li, Stowers Institute of Medical Research

Synapse Assembly and Plasticity
Ann Marie Craig, University of British Columbia
Nancy Y. Ip, Hong Kong University of Science & Technology

For more information, contact the ASCB at (301) 347-9300, ascbinfo@ascb.org or www.ascb.org.

BSCB Ambassadors

The Society has representatives at each of the institutions listed below. The Ambassadors have agreed to promote Society activities and membership within their University or Institute. They disseminate advertisements concerning future BSCB meetings, promote the advantages of membership, particularly to new PhD students, and are available to sign application forms and answer any BSCB-related questions. If your institute is not represented and you would be willing to become and ambassador, please contact Jonathan Pines.

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In brief...

Member benefits
Did you know that your membership benefits include discounted journal subscriptions and discounts on Oxford University Press books? The money saved more than compensates for society membership fees so do encourage your friends and colleagues to join.

Students also benefit from reduced membership fees so do encourage any new postgrads joining you in the autumn to join the BSCB.

Funding for local meetings
The Society is prepared to provide limited financial support for meetings organized by any local interest group relevant to cell biology.

Request for funds should be sent to the Treasurer, Mark Marsh, accompanied where possible by a report of a previous meeting. If a meeting receives support, a report from that meeting will be required for publication in the Newsletter.

BSCB membership database
The website contains the facility to search for members of the Society. However, under the data protection Act, we can include your details only if you specifically grant us permission to do so. If you wish to be included and are not, please contact Margaret Clements (bscb@biologists.com).

Archived Newsletters online
Previous versions of the BSCB Newsletter are now available on the BSCB website; so, if you lose your copy then you will still have access to all of the content. Further changes to the website will be taking place shortly. www.bscb.org

Schools News

There is a saying "a week is a long time in politics". With the present frenetic rate of development in the biosciences, some would say that "a week is a long time in cell and molecular biology".

It was with this in mind that I was pleased to be given the opportunity to take part in a consultation exercise currently being conducted by the Qualifications and Curriculum Authority (The QCA is a government body) relating to the revision of criteria and some subject detail at AS/A levels of the GCE (General Certificate of Education). After the consultation the views and suggestions are considered. They are then adopted or rejected and the process rolls on to the awarding bodies. They develop specifications from the revised criteria, produce curricula, and write specimen questions, marking guides and so on. This has to be done at least several months before the implementation date (usually the beginning of the school year) so that teachers can attend professional development sessions and adjust their work accordingly. In curriculum change even a short time is several years, with several more years having to elapse before you know whether the changes are beneficial or whether you have made a hash of things. And, unlike some clinical trials there is no double blind testing!

So, what can one offer in the way of views and suggestions? Clearly that depends on the current situation and the criteria proposed by the QCA. First then the good news. (1) The cell biology content of AS/A level biology is reasonable and QCA have done a good job. To cell biology enthusiasts of course there is never enough cell biology but even they would agree it is important to know about life at the organism level. (2) QCA want fewer assessment units and for them to be "more holistic, less mechanistic and more supportive of extended writing" and " material....that challenges students and promotes independent thought and learning". (3) Teachers and students want information about cell biology. This is borne out by the fact that 'cell biology' is one of the most frequently visited sites of the Biochemical Society's portal website www.biochem4schools.org

And the bad news? (1) Surveys have shown that AS/A level biology is currently perceived to be the second hardest 'A' level (General Studies is the hardest) largely because the "content level is too high" and "there is too much to remember" and, (2) In the July 2003 (No 37) 'Save British Science' Newsletter it was reported that "....only half of biology teachers say that they have a 'lot of confidence' in their ability to teach modern biological material".

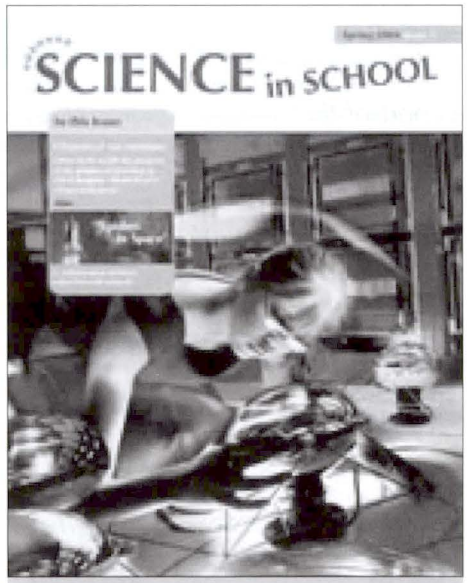
Accept these points and one is left with little room for manoeuvre. Requesting that further major topics are added would be counter productive, so what does one offer? Fortunately the committee of the BSCB had addressed this area
two years ago and concluded that in AS/A level work "There are three well-established topics that need to be viewed in a fresh way. Major changes are not needed. Rather it is a matter of showing how some well established topics fit into what is proving to be a 'bigger picture', a larger and more expansive concept, than previously thought". It was suggested (1) that the term 'cell signalling' should be used in association with the established topics of endocrine, neuronal and cAMP systems. (2) That when mitosis is discussed more emphasis should be placed on it being part of the 'big picture' of the cell cycle' and, (3) when the following topics are taught: (a) characteristics of life, (b) development
(c) homeostasis, and (d) disease and disorder, then programmed cell death, apoptosis or 'cell suicide' should form part of the explanation and vocabulary.

These three points have been submitted to the QCA for their consideration. They would appear to conform to the criteria set out in the QCA document concerning "extended writing" and so on, as mentioned above.

We will now have to wait to see the end result of the input.

The BSCB is endeavouring to help teachers and students in other ways. More information will be available in a future edition of the BSCB Newsletter.

David Archer
(BSCB Schools Liaison Officer)



Science in School

Science in School is a new European journal to promote inspiring science teaching. It covers not only biology, physics and chemistry, but also maths and earth sciences.

The contents include teaching materials; cutting-edge science; education projects; interviews with young scientists and inspiring teachers; education research; book reviews; European events for teachers; and an online discussion forum.

Science in School is freely available. Online articles are published in many European languages; a print version is distributed in English. More details and the first issue are available at: **www.scienceinschool.org**.

To receive an alert when each issue is published, send an email with the subject 'Subscribe to Science in School' to scienceinschool@embl.de. Include your postal address to receive a free print subscription, if possible.

The image shows the cover of the first issue of *Science in School* which shows Jasmine Ma, a summer student working on the MiniBooNE experiment, inspects one of the phototubes that detect light from neutrino interactions (Credit: Fermi National Accelerator Laboratory).

Biochemical Journal celebrates its 100th birthday

As part of the celebrations to mark the centenary year of the Biochemical Journal, Portland Press Ltd, the Biochemical Society's publishing subsidiary, has digitized the complete archive of the journal. This was a considerable undertaking, funded mainly by the Wellcome Trust and managed by the National Library of Medicine in the US and the UK Joint Information Systems Committee.

After nearly three years' work, all 392 volumes from the past 100 years are now available online. The archive includes seminal papers by pioneers in their fields who have shaped the face of modern cellular and molecular biology.

The Biochemical Society is organizing a series of public events to celebrate the Journal's centenary (see www.bjcentenary.org for more information). The first was an evening reception at the British Library during which a copy of the digital archive was presented to Lynne Brindley, Chief Executive of the British Library, by Professor Sir Philip Cohen (Dundee), the President of the Biochemical Society (right). Lynne said that the digitising initiative had helped fulfil the British Library's mission to "conserve knowledge and make it available to all."

Many prominent figures from the life science community gathered to celebrate the occasion and toast the Journal in champagne. They included Members of Parliament Dr Ian Gibson and Dr Phyllis Starkey, both of whom combine a background in biochemistry with the cut and thrust of politics. There were several Nobel Laureates, including at least one member of the BSCB in Tim Hunt.

During the brief talks before the real business of the evening began, George Banting, Chair of the *Biochemical Journal* editorial board, spoke of the journal's enduring influence and success, and acknowledged the contribution of the professional staff. In particular, he praised the Journal's in-house IT team who have developed an innovative interface for viewing scientific articles online, namely EESI-View .

Rhonda Oliver, MD of Portland Press, said: "The reception was a very successful start to the centenary celebrations and it was a pleasure to welcome so many colleagues, both old and new, to celebrate 100 years of scientific excellence in the *Biochemical Journal*. However, we have no intention of resting on our laurels and are already working on a project to ensure the Biochemical Journal maintains its reputation for innovation in this digital age."

Joan Marsh

Below, left: Professor Sir Philip Cohen, President of the Biochemical Society, presents Lynne Brindley, Chief Executive of the British Library, with a copy of the *Biochemical Journal* digital archive. Below, right: The evening reception at the British Library.

Book reviews

Analysis of genes and genomes

Richard Reece

This book covers the basics of analysis of genes and genomes. Good for an introductory class in molecular biology tools or as a complementy book for a bioinformatics course, for students with basic biology and basic knowledge of cellular or molecular biology.

The book contains very useful illustrations, simple but informative. For example, Figure 1-22 compares prokaryotic and eukaryotic genes showing clearly the differences. Figure 1-30 is a very nice diagram of alternative splicing; Figure 9-7 illustrates the process of sequencing. This concept is usually difficult for students the first time they encounter the subject. In general, I found the figures informative and clear. There are a couple of suggestions that could improve the text: in section 1-13, it would be good to mention and explain the six open reading frames and the orientation of the genes and on page 55, it would be helpful to explain why the mRNA that encodes histone proteins is not polyadenylated.

Chapter 2 deals with the basic techniques in gene analysis, at an introductory level but clearly explained. Chapter 3 covers different types of vectors and their characteristics. This chapter will be useful not only for the beginner, but also for a graduate student that wants to refresh his/her knowledge about a particular vector.

Chapter 3 describes the polymerase chain reaction and its application, covering the key points nicely. Chapter 5 deals with different types of libraries and cloning genes, covering PCR cloning, genomic and cDNA libraries, directional cDNA cloning, PCR-based libraries and subtraction libraries. The chapter is easy to read and clearly explains the use of each method.

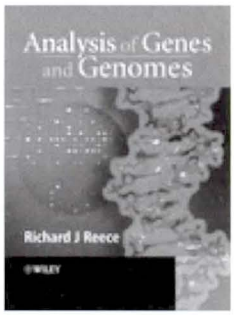
Chapter 6 deals with gene identification. In the section on screening the interaction of proteins, the FRET method should have been included, as it has a lot of potential.

Additionally, it would have been helpful to have a better explanation of phage display. Chapter 7 clearly describes the creation of mutations using different methods. Protein production and purification are discussed in chapter 8, giving the basics of gene expression in *Escherichia coli*, yeast, insects and higher eukaryotic cells as well as of protein purification. I found the chapter interesting and easy to read. It is great for students to help them understand the concepts. Chapter 9 introduces the genome sequencing projects and the basics of gene sequencing. I think it is clear and to the point.

Chapter 10 (post-genome analysis) would benefit from a better explanation and diagrams about RNAi. This is an important technique and I think students should become familiar with its basic principles. The concept of NMR and X-ray crystallography is introduced but a little explanation of these two methods would have been nice.

Chapters 11, 12 and 13 deal with genetic engineering. The chapters are well organized and well written. In section 11-2 (commercial exploitation of plant transgenics), it would have been better to introduce the example of 'golden rice' and the different genes that were introduced to generate this transgenic plant. This section gives the impression that the only purpose of creating transgenic plants is to generate plants resistant to pathogens. This is an important application, but not the only reason why transgenic plants have been developed and the students need to know this.

On page 395, the report of the first cloned human child has been discredited since publication of the book. The human gene therapy section (13-4) could be explained better and the diagrams improved. The use of adenoviruses and the new vectors that are being tested should be explained with more clarity.



Analysis of genes and genomes
John Wiley & Sons, Ltd.
ISBN 0-470-84379-9

In general, I think this book is very helpful for reading and understanding the basics of genes and genomes. However, because of the title, I was expecting to find exercises that the students could do in order to understand how to analyse genes and genomes. The book is aimed at providing basic concepts so students can apply these in analysing genomes. For a bioinformatics class, it will be very useful if supplemented with another book that centres on the bioinformatics part. But it is a great complement for such a class or for a molecular biology class. I recommend this book, not only for its use in the classroom, but also for anybody wanting to learn about genomes and the basic laboratory tools used in molecular biology. It is easy to read and understand and really flows well.

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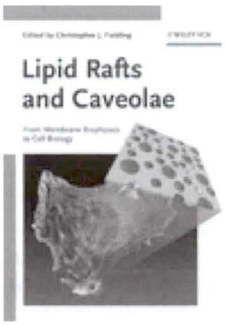
Lipid Rafts and Caveolae

Edited by Christopher J. Fielding

The last two decades have seen an explosion of interest in membrane biology, and in particular in lipid rafts and caveolae. This has led to a fundamental re-evaluation of the fluid mosaic model that was first proposed by Singer and Nicholson in the early 1970s. Moreover, it has revolutionised our understanding of cell signalling and protein trafficking. It is therefore surprising, given the huge volume of research that has been generated in this area, that *Lipid Rafts and Caveolae* is the first book dedicated in its entirety to this subject.

The book commences with an overview of the main molecular constituents of membranes and discusses their contribution to membrane archi-tecture. This theme is developed to explain the principles of cargo sorting and vesicle formation in membrane trafficking. This is followed by chapters describ-



ing the forces that shape caveolae and the biophysical characterisation of lipid rafts. Cell biologists will be particularly interested in the central chapters that cover in detail the roles of caveolae in endocytosis, signal transduction, actin cytoskeleton remodelling, shape formation and chaperone complexes. The final chapters see a switch of focus towards medicine, with chapters reviewing the role of lipid rafts and caveolae in Alzheimer's disease, prion-dependent diseases, cardiovascular homeostasis, and cancer.

The book is well organised; the individual chapters are up to date, well referenced and illustrated. My only reservation in recommending this book is that it assumes, and requires, that the reader already possesses a solid grounding in basic biochemistry and cell biology. Therefore, it is probably not suitable for the average modern day undergraduate. However, for those at or beyond graduate student level it provides an extensive and authoritative review of all aspects of biology and medicine influenced by lipid rafts and caveolae. Furthermore, not only is this a good basic text, but the chapters are often research oriented and incorporate lively discussion and explanation of the principles of modern state-of-the-art technology and its use in the development of current theories. As such, this book would be of great help to researchers who are first encountering professional laboratory research in this field.

In conclusion, this book is a delightful mix of structural biology, biophysics, cell biology, biochemistry, physiology and medicine. All researchers in biomedicine with an interest in membrane biology will find this book both informative and an excellent point of reference. Its acquisition would provide a valuable addition to the bookshelves of all who purchase it.

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Lipid Rafts and Caveolae: From Membrane Biophysics to Cell Biology
Edited by Christopher J. Fielding
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March 2006
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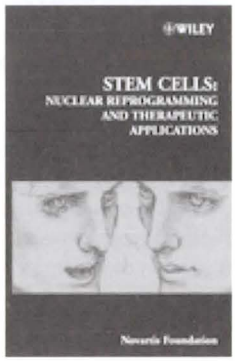
Stem Cells: Nuclear reprogramming and therapeutic applications

Novartis Foundation Symposium 265

This book is a collection of the presentations from a Novartis Foundation Symposium held in London during March 2004 at which leading scientists in Stem Cell Research presented and discussed their research. Stem cells can proliferate without changing their phenotype but are also able to simultaneously differentiate into one or more new cell types. Topics covered include the nature of stem cells, how they can be defined in functional and molecular terms, their properties, their sources, how they can be recognised, isolated and grown (with special attention to how this can be controlled in the laboratory), and how they can be differentiated.

The book starts with an introductory review by Davor Solter addressing what embryonic stem cell research is, the current state of the science and contentious issues that surround this field. He considers issues such as whether cells that have the capacity for differentiation equal to that of embryonic stem cells can be derived from adult organisms and what the appropriate sources of such cells would be.
The potential clinical use of embryonic stem (ES) cells and their differentiated derivatives in cell, tissue and possibly organ replacement are the subject of much current debate. ES cells could potentially serve as vehicles for gene therapy. The isolation of ES cells from patients with genetic diseases could provide us with *in vitro* models of these diseases and enable us to study their pathogenesis. These cells could also serve as valuable models for drug discovery and testing. With these issues in mind, participants describe other possible sources of stem cells such as bone marrow–derived hepatocytes, multipotent adult progenitor cells, stem cell creation in *Xenopus* oocytes, haematopoietic stem cells, neural stem cells and cardiac stem cells.

Specific clinical applications are explored, such as the generation of insulin-producing cells, which would be extremely valuable for the treatment of diabetes type 1 and 2, and cell therapy for Parkinson's disease. This book also features the important ethical and policy issues that have created the framework within which scientists carry out stem cell research. In the final discussion, there is a very helpful concise overview of the regulatory environment in various countries, including Germany, Israel, Spain, Australia, Sweden, Norway, Switzerland, the UK, and the USA.



Overall, this collection of papers gives a comprehensive overview of current issues in stem cell research. The collection will be very useful for scientists and students in this field, but also to anyone who would like to understand more about stem cell research.

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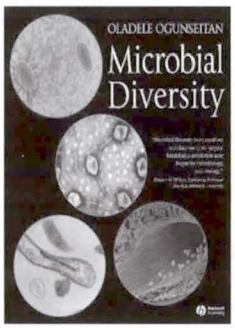
Microbial Diversity: Form and Function in Prokaryotes

Oladele Ogunseitan



It is estimated that, because of the fastidious growth requirements exhibited by many microorganisms, standard culture methods fail to adequately represent the enormous microbial diversity existing in nature. Even when growth conditions are altered to mimic environmental conditions, up to 80% of organisms identified by culture-independent methods fail to grow in culture (1, 2).

Prokaryotes represent the largest source of genetic diversity on Earth. They outnumber all other organisms, have a larger biomass and occupy much larger sections of the biosphere, at the same time making the planet livable by managing its biogeochemistry. Yet prokaryotic diversity is thought to constitute one of the greatest knowledge gaps in biology (3). In context of the recent advances in microbial population genetics, ecology and genomics, it was estimated that the current methods for defining prokaryotic species are incapable of keeping pace with the diversity that is constantly uncovered in nature (4).

Ogunseitan's *Microbial Diversity* adopts a multidisciplinary perspective and offers an in-depth view of the topic. The book starts by underscoring fundamental problems in the field, such as our inadequacy in estimating the number of microbial species, and our loose definition of species and strains. A fascinating historical approach provides a glimpse back into the times when microscopy offered the first peek into microbial diversity.

Subsequent chapters illustrate how molecular techniques, genomics and phylogenetics have increasingly complemented the information provided by the simple morphological examination of microorganisms, and have at the same time provided information on a much finer scale. Moreover, the author emphasizes the importance of using the information provided by several techniques, when collecting information about microorganism diversity in natural ecosystems.

In his words, "microorganisms do not generally leave fossils, and genetic exchange is rampant"; his statement is a powerful indication of challenges that can be associated with studying microbial diversity.

Microbial Diversity integrates microbiology with Earth science, and explores the role microorganisms have played in the evolution of life on our planet. Focusing on the Earth as an integrated biogeochemical system, it underscores how microbial communities are involved in maintaining balanced and interconnected biogeochemical pathways, and explores the potential consequences geochemical disequilibria could have on microbial communities. Fascinating stories about the chemical composition of interstellar dust and panspermia reflect the multiple and sometimes conflicting theories about the origin of microorganisms on our planet.

The book is a vivid description of the central place microorganisms have occupied in the existence of our planet, and it reflects the mysteries, challenges and surprises that they still hold. At the same time, it is a testimony of the prolonged existence of bacteria on our planet, a powerful reminder of the words of Stephen Jay Gould: "Our planet has always been in the 'Age of Bacteria', ever since the first fossils – bacteria, of course – were entombed in rocks more than 3 billion years ago" (5).

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Microbial Diversity: Form and Function in Prokaryotes
Oladele Ogunseitan
Blackwell Publishers 0632-047089
October 2004 , 292 pages

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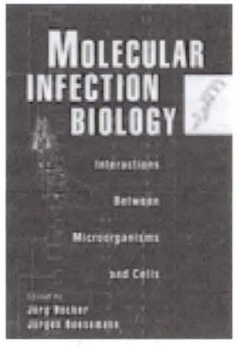
Molecular Infection Biology: Interactions Between Microorganisms and Cells

Edited by Jörg Hacker and Jürgen Heesemann



In Laurie Garrett's words, microorganisms "are our predators and they will be victorious if we, *Homo sapiens*, do not learn how to live in a rational global village that affords the microbes few opportunities. It's either that or we brace ourselves for the coming plague" (1).

Microorganisms have indeed proven to be our predators: recent estimates reported about 15 million annual worldwide deaths to be the direct consequence of infectious diseases (2). Previously known infectious diseases are currently re-emerging, new infectious agents are continually surfacing and some pathogens constantly adapt to new geographical areas and to new hosts. These factors, compounded by additional ones, such as changes in the profile of drug resistance, have brought microbial pathogenesis to the attention of medicine, biomedical sciences and public health. At the same time, recent biomedical advances have improved our ability to comprehend host–pathogen interactions. Genomics, proteomics and bioinformatics have become promising new tools in exploring virulence and pathogenesis (3) and they hold renewed hopes for revolutionizing vaccine design (4).

These recent advances and the dynamic interplay between microorganisms and hosts are some of the reasons that render Hacker and Heesemann's Molecular Infection Biology an important text with perfect timing. The book opens with a fundamental question, a question that for most of us would pose considerable challenges: What are pathogens? This apparently simple issue represents a topic of utmost importance and the subject of countless debates. The definition of pathogenicity and virulence has undergone continuous changes and revisions as new findings have surfaced over the years (5, 6).
In twenty three chapters, Hacker and Heesemann explore host–pathogen interactions from multiple perspectives. In their book, we encounter sections that examine host defences against pathogens (nonspecific and acquired defences), insights into pathogens' ability to cause disease (offensive,

defensive and nonspecific pathogenicity factors), and they emphasize the importance of an ecological perspective. The multitude of topics reflects the interdisciplinary approach necessary for a thorough understanding of host–pathogen interactions, and the increasing complexity of this topic. Information from several disciplines, such as cell biology, structural biology, molecular genetics, evolution and signal transduction, converges in the text.

Molecular Infection Biology will represent a great resource for students coming from various fields of study. One of the strengths of this text is the broad range of topics discussed: the book covers concepts ranging from phase and antigenic variation, regulation of virulence factors, and *in vivo* gene expression, to animal models of infectious diseases, vaccines and antibiotic resistance. The conclusive chapter provides insights into molecular infection biology methods, such as mutagenesis, fluorescence-based in situ hybridization, mRNA differential display, and reporter gene technologies, and is a particularly useful part of the book. Although genomics, proteomics and bioinformatics receive some attention, future editions would greatly benefit from more detailed insights into these topics.

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Molecular Infection Biology: Interactions Between Microorganisms and Cells
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Wiley-VCH, 0471-178462
October 2002 339 pages

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Joint EMBO-FEBS-ESF Workshop on Membrane Dynamics in Endocytosis

Sant Feliu de Guixols, September 2005

The hotel Eden Roc in Sant Feliu de Guixols on the Costa Brava in Spain provided a beautiful setting for the conference and an opportunity for some late summer sun before the onset of winter. Margaret Robinson (University of Cambridge, UK) and Howard Riezman (University of Geneva, Switzerland) organised both a scientifically and culturally diverse programme of participants. As a 2nd year Ph.D student I was excited by the prospect of hearing talks from many of the world's top researchers in the field of endocytosis. I received funding jointly from the BSCB Honor Fell Travel Award scheme and from a Four-Year Wellcome Trust Ph.D Studentship.

Due to the size of the conference (approximately 150 delegates) only 1 session ran at a time, ensuring the rare opportunity at a conference to hear every talk. Each session hosted four invited speakers and three short talks chosen from abstracts. Three evening poster sessions were held, each with approximately 30 participants. A keynote lecture by Marino Zerial (Max-Planck-Institute of Molecular Cell Biology, Germany) completed the programme. Instead of trying to cover all of the talks I shall concentrate on a few that I found particularly interesting.

The conference began with a session on the initial phase of endocytosis, entry into the cell via the plasma membrane. The first talk demonstrated impressive use of live cell imaging to investigate clathrin-mediated endocytosis. Christien Merrifield (MRC Laboratory of Molecular Biology, Cambridge) has used a combination of epifluorescence and evanescent field microscopy to image individual clathrin-coated vesicles (CCV) forming on the cell surface and subsequently trafficking into the cell. He has developed a clever system involving a pH-sensitive fluorescently tagged transferrin receptor and a continual pulse of neutral/acidic medium and simultaneous switching between epifluorescence and evanescent field microscopy. Using this approach Merrifield has been able to follow endocytosing CCVs and visualise the recruitment of actin and cortactin prior to clathrin coat disassembly.

The second session covered the traffic of cargo within endosomes. Satyajit Mayor (National Centre for Biological Sciences, Bangalore, India) described his work investigating the trafficking of folate receptors as a model of endocytosis of GPI-anchored proteins. Folate receptors are endocytosed by a mechanism independent of clathrin, caveolin, dynamin and Arf-6. Folate receptors become concentrated in clusters in the plasma membrane, a process that is impaired on depletion of both cholesterol and sphingolipids.

The second day began with a session on endosomal organisation and dynamics. Clare Futter (University College London,UK) presented her recent work on the characterisation of subpopulations of multivesicular bodies (MVBs). She has used electron microscopy to follow the pathway taken by endocytosed epidermal growth factor (EGF) bound to its receptor (EGFR) en route to lysosomes. EGF:EGFR complexes traffic via multivesicular bodies (MVBs) but do not co-localise with lyso-bisphosphophatidic acid (LBPA; a common marker for MVBs) until reaching the lysosome. The presence of endocytosed EGF:EGFR and LBPA in morphologically identical but distinct MVBs suggests the occurrence of sub-populations of MVBs within the endocytic pathway.

The fourth session dealt with signalling in the endocytic pathway. Pier Paolo di Fiore (FICR Institute of Molecular Oncology Foundation, Italy) presented his recent data on the role of ubiquitination in EGF signalling and downregulation. His data suggest that internal trafficking of EGFR is differentially regulated at two different physiological concentrations of extracellular EGF. At low EGF concentrations, EGFR is internalised in a clathrin-dependent fashion. At high EGF concentrations, EGFR is internalised by clathrin-dependent as well as caveolin-dependent mechanims and subsequently degraded in lysosomes.

In his keynote lecture Marino Zerial described many years of work on the role of Rab5 and its effectors in endosomal formation and maturation. The exchange of Rab5-bound GTP and GDP is mediated by interaction with many Rab5 effectors. Constant cycling between GTP and GDP-bound forms of Rab5 occurs as early endosomes mature to late endosomes and traffic in from the plasma membrane and towards the nucleus. Maturation of early endosomes is completed by the replacement of Rab5 with Rab7 in the centre of the cell. Zerial also talked about his recent studies using RNA interference (RNAi) based screens to identify novel mediators of endocytosis. There are known examples of growth factor signalling cascades that result in activation of kinases, whose function directly impacts on endocytic pathways. For example, growth factor signalling leads to stimulation of MAPK signalling and subsequent inhibition of caveaolin- and clathrin-dependent internalisation pathways. To this end Zerial has depleted cellular kinases by RNAi to investigate their role in mediating known internalisation pathways. More than 200 kinases have thus been found to regulate endocytosis pathways.

The role of endocytosis in development was considered in the fifth session. Roland Le Borgne (ENS, Paris, France) from Francois Schweisguth's group spoke about the role of E3 ubiquitin ligases in Notch endocytosis in *Drosophila melanogaster*. Delta and Serrate mediated endocytosis of Notch requires two E3 ligases, Mindbomb and Neuralized. Both of these ligases are required for Notch internalisation but their requirement is likely to be in different cells at different stages of fly development.

Gillian Griffiths (University of Oxford, UK) talked about her recent work on secretory lysosomes. Cytotoxic T lymphocytes (CTL) contain secretory lysosomes, which on contact with a target cell, are recruited to the

plasma membrane at the site of contact (immune synapse) in order to release granzymes into the target cell to bring about its destruction. In order to study the mechanism of recruitment of secretory lysosomes to the immune synapse Griffiths looked for records of genetic human diseases that result in impaired immune function. The association of several trafficking proteins with impaired T-cell function has led her to elucidate a mechanism by which secretory lysosomes are delivered to the immune synapse by association with centrioles. Upon docking of the CTL with its target cells, the centrioles become re-positioned just beneath the plasma membrane allowing the secretory lysosome to fuse with the plasma membrane, releasing its contents into the target cell.

In the final session Pascale Cossart (Institut Pasteur, Paris, France) described her work on Listeria Monocytogenes. L. Monocytogenes is one of many parasites to exploit the endocytic pathway in order to infect mammalian hosts. A cell surface protein, In1B, in the bacterial membrane binds to the Met receptor on the cell surface of mammalian cells, resulting in receptor-mediated endocytosis of the parasite in an ubiquitin-dependent fashion.

Cbl was shown mediate mono-ubiquitination of the Met receptor and depletion of Cbl by RNAi resulted in reduced L. monocytogenes infection. In contrast, overexpression of Cbl or of ubiquitin resulted in increased infection. Subsequent internalisation L. monocytogenes of is clathrin, Eps15 and dynamin-dependent. However, AP-2 is not required.

All-in-all the 'Membrane Dynamics in Endocytosis' meeting proved to be very successful. As I have tried to convey here, the programme covered many interesting aspects of endocytosis. This included further characterisation of well-documented endocytic models as well as the exploration of applied endocytosis in fields such as development and immunology. I apologise to those speakers that I have not been able to mention here.

At the end of the conference I decided to take advantage of the location by spending the long weekend in Barcelona with my boyfriend Jim. This happened to coincide with the city's largest festival 'La Merce' a celebration of the patron saint of Barcelona. We took the time to investigate some of the Catalunyan traditions, such as the show of the castellers (see picture).

Sian Piper, Cambridge Institute for Medical Research, Cambridge.

Jacques Monod conference: on Molecular Machines in Cell Division

Roscoff France, 10–14 September 2005

After a 2 hour drive from the airport of Dinard, through the nice cities and country side of Brittany we reached Roscoff, a beautiful small town on the coast. Roscoff is the home of Station Biologique de Roscoff (SBR), a marine biology and oceanology research and teaching centre, and a great meeting venue with beautiful views.

This Jaques Monod Conference on cell division happens every three years, and has a great tradition of attracting some of the best scientists in the field, as illustrated in pictures of previous meetings presented by Tim Hunt. The meeting was centred on the molecular machines of cell division. How does our current understanding of those molecules help us to understand such a beautiful orchestrated cellular process? There were so many impressive talks and posters that I cannot mention all the interesting ones! The conference covered the whole gamut of cell cycle machinery, from centrosomes and spindle pole bodies to kinetochores, cohesins, condensins, the APC, signalling molecules and so on. I am just going to point a few highlights.

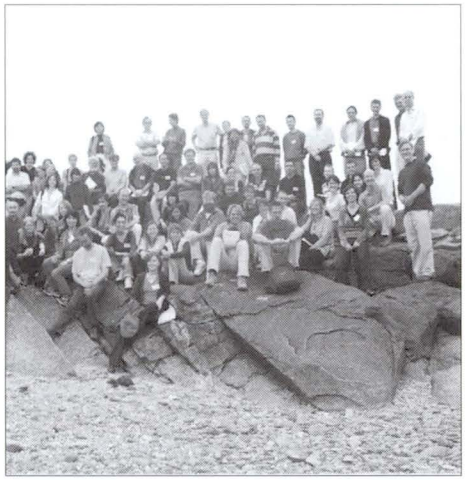
Centrosomes and MTOCs

Pierre Gonczy (ISREC, Lausanne, Switzerland) discussed the interesting findings from his lab on a group of proteins that regulate centriole duplication in *C. elegans*: SAS-4, 5 and 6. Because the assembly of a bipolar mitotic spindle in early embryonic divisions in *C. elegans* depends on the existence of two centrosomes, this system has facilitated the understanding of centrosome duplication. It also identified other molecules, SPD-2 and ZYG-1, which regulate this process. Pierre discussed the finding that there is a clear orthologue of SAS-6 in humans, suggesting the conservation of the centrosome duplication machinery. Both David Glover (University of Cambridge, UK) and Erich Nigg (Max-Planck, Martinsried, Germany) discussed another molecule that regulates centrosome duplication, a member of the polo-like kinase family, called SAK/PLK4. This kinase may be the orthologue of the *C. elegans* kinase Zyg-1. Depletion of SAK in

human and *Drosophila* tissue culture cells leads to failure of centriole duplication. The same phenotype was observed in *Drosophila* SAK mutants. *Drosophila* cells tolerate the lack of centrioles and undertake mitosis but cannot form basal bodies and hence flagella. Human cells depleted of SAK show error-prone mitosis, likely to underlie its tumour-suppressor role. One of the most interesting results was that both in *Drosophila* and Human cells overexpression of SAK led to overduplication of centrioles. This was dependent on CDK2, CP110 and SAS-6, although it is not clear whether any of these molecules is a substrate of SAK. Ian Hagan (Paterson Institute, Manchester, UK) spoke about a novel function for polo kinase. He showed that polo kinase (plo1) links the stress pathway to cell cycle control and tip growth in fission yeast. The stress response pathway promotes phosphorylation of Plo1 on Ser402. This promotes Plo1 recruitment to the SPBs and hence commitment to mitosis in normal cycles and also efficient re-initiation of cell tip growth and cell division during recovery from particular stresses. Polo kinases may thus have an even more widespread function than originally thought, being now the challenge to find how they regulate cytoskeletal transitions.

Spindle assembly and orientation and how this can impinge in cancer

Michel Bornens (Institut Curie, Paris, France) discussed how the extracellular matrix guides the orientation of the mitotic spindle. His team have developed an original approach to the study the effect of spatial constraints on the division of adherent cells. They used a micropatterning technique, to stamp out adherent shapes on different patterns (rectangles, discs, triangles and L shapes) that constrain the attachment of many synchronised cells. Then, they closely monitored cell division and the positioning of daughter cells by video microscopy, showing that the axis of cell division is oriented as a function of cellular points of adhesion to its surroundings in interphase cells. When the cell divides, it may round up and change its shape but its cortex and the actin cytoskeleton associated with it provide a memory of its adhesions. Cayetano Gonzalez (IRBB, Barcelona, Spain) gave a thought provoking talk about induction of tumour growth as a consequence of altered stem cell division asymmetry in *Drosophila*. It has been known that loss of cell polarity and cancer are tightly correlated but it has been difficult to demonstrate a causal relationship. Using *Drosophila* mutations that impair asymmetric division of



neuronal stem cells, Cayetano and colleagues provided genetic evidence in *Drosophila melanogaster* that the disturbance of this delicately balanced process in neuronal stem cells induces a cancer-like state. They implanted larval brain tissue carrying neuroblasts with mutations in pins, mira, numb and pros into adult wild-type hosts. This tissue grew to more than 100 times its initial size, invading and killing other tissues. Asymmetric division of stem cells results into two unequal daughter cells, only one of which resembles the parent stem cell. In these mutants, symmetrical divisions dramatically increased the number of stem cells. Loss of genes that control fate of cells led to hyperproliferation in these cells, leading to cancer. The fact that the tumours found were immortal and showed the hallmarks of many cancers (genomic instability, aneuploidy, centrosome aberrations, and ability to metastasize) makes this a great system to study cancer progression and how the hallmarks of cancer arise.

How to Make a Mitotic Chromosome

Claudio Sunkel (IBMC, Porto, Portugal) showed that condensin I is necessary for mitotic chromosome resolution in *Drosophila* cells and to maintain the structural integrity of centromeric heterochromatin during mitosis. Condensins are a multiprotein complex involved in the amazing process of chromosome condensation in mitosis. Depletion of the *Drosophila* CAP-H homologue Barren from S2 cells, a subunit exclusively associated with condensin I, gives rise to mitotic chromosomes which are able to condense but fail to resolve sister chromatids. They showed that upon depletion of Barren, the centromeric and pericentromeric heterochromatin chromosomes have structural problems associated with chromosome congression defects, suggesting that the condensin I complex may also be required to maintain the structural integrity of centromeric heterochromatin during mitosis. Prasad V. Jallepalli (Sloan-Kettering Cancer Center, NY, USA) introduced us to some novel functions of separase. Anaphase is triggered when the cysteine protease separase cleaves chromosome-bound cohesion. Using targeted mutagenesis of the endogenous hSeparase locus in somatic cells Prasad's team showed that separase auto-cleavage coordinates multiple aspects of the G2/M programme in human cells, contributing to the timing and efficiency of chromosome segregation. Cells deficient in separase auto-cleavage exhibited defects in spindle assembly and metaphase chromosome alignment.

Of Centromeres, Kinetochores and Checkpoints

Tomo Tanaka (University of Dundee, UK) discussed kinetochore capture and bi-orientation on the mitotic spindle. His team produced beautiful work visualizing individual kinetochore-microtubule interactions in *Saccharomyces cerevisiae* by marking individual centromeres with GFP and microtubules with YFP. Using a multiplicity of mutants he showed that proper kinetochore capture is achieved in a stepwise manner dependent on several molecules. Kinetochores are initially captured by the lateral surface of a single microtubule extending from spindle poles, and are subsequently transported poleward along them. The microtubule extension from spindle poles requires microtubule plus-end-tracking proteins and the Ran GDP/GTP exchange factor. Kinetochore components, such as the CBF3, Ndc80, Mtw1 and Ctf19 complexes, are used for kinetochore capture by microtubules.

Other proteins, such as Kar3, a kinesin-14 family member, regulate the transport of captured kinetochores along microtubules. Kinetochores then facilitate the conversion of microtubule dynamics from shrinkage to growth at the plus ends, thereby ensure that they do not slide off their associated microtubules.

Peter Sorger (MIT, Boston) used a combination of techniques, including RNAi and time-lapse imaging of mitotic cells to investigate the role of several proteins in the spindle assembly checkpoint and gave us an overall view of the regulation of the metaphase-anaphase transition. While proteins, such as Mad1 and Bub3 are "classic" checkpoint proteins and their depletion affects mitosis only in the presence

of improperly attached chromosomes; RNAi of Mad2 and BubR1 accelerates dramatically the timing of mitosis, even when kinetochores are disrupted. This data indicated that Mad2 and BubR1 might be part of an intrinsic timing mechanism for anaphase onset, independent of kinetochores. RNAi of Bub1 inactivates checkpoint control but also disrupted chromosome congression; interestingly inactivation of a variety of microtubule plus end binding proteins, such as EB1 and the APC, altered kinetochore-MT interaction in a way that was not sensed by the checkpoint and eventually led to chromosome instability. Finally, RNAi of CMT2 (p31;comet), a regulator of mad2, blocked the cells at the metaphase-anaphase transition.

Jonathan Pines (Gurdon Institute, Cambridge, UK) discussed the findings of his group regarding the regulation of the anaphase promoting complex/cyclosome (APC/C), a multi-subunit ubiquitin ligase that targets specific proteins for proteasomal degradation. The APC/C is regulated by the spindle checkpoint by inactivation of cdc20, a co-activator of the APC/C. The APC/C itself co-localizes with components of the spindle checkpoint to improperly attached kinetochores. This may explain the tight temporal control on the APC/C by the checkpoint. Using impressive cell biology assays to visualize the spatial and temporal control of the degradation of different mitotic regulators he showed that degradation of cyclin B happens at the mitotic spindle, 20 minutes after chromosome attachment and alignment at the metaphase plate. If during this time Taxol is added to the cells, cyclin B returns to the spindle. When a CAX box is added to cyclin B to tether it to the cell membrane, this form of cyclin B is only degraded at anaphase, showing the importance of spatial regulation of proteolysis. This restriction of ubiquitination to the vicinity of the mitotic spindle may explain how the spindle assembly checkpoint is fast in inhibiting the APC/C. Additionally, two other regulators, polo-like kinase 1 (Plk1) and Aurora A, are degraded at different times after the anaphase-promoting complex/cyclosome (APC/C) switches from binding Cdc20 to Cdh1.

All in all, the Jacques Monod conference on 'Molecular Machines in Cell Division Translation' proved to be a very interesting and entertaining meeting, where it was possible to hear very exciting science and meet many interesting people. My thanks go to the BSCB for the Honor Fell Travel Award which went towards the cost of attending this meeting.

Monica Bettencourt-Dias Department of Genetics, University of Cambridge

35th Annual meeting for the Society of Neuroscience

Washington DC, November 2005

With over 30,000 people attending the 5 day conference this was always going to be a large and exciting conference; thanks to an Honor Fell Travel Award from the BSCB, I was also able to be there. To the uninitiated this annual neuroscience conference can be a daunting meeting in the scientific calendar. Fortunately for me this was my second Neuroscience conference, following my first experience in New Orleans (2004). With poster and slide sessions ranging from Activity-Dependent Developmental neuroscience through Neural Stem Cells to Pavlovian conditioning this was to be an interesting and busy week with something for everyone.

Before the conference a large amount of interest had been generated by the prospect of the Dali Lama, giving a key note speech on the Saturday. Both the scientific and wider press had been the platform for a debate regarding the scientific and political validity of the presence of the Dali Lama with the threat of boycotts and demonstrations by some parts of the scientific community. However, this debate did not prevent the Dali Lama arriving amid heavy security and delivering a speech worthy of a man who presides over one of the oldest religions of the world. His speech was received by both a full lecture hall as well as delegates watching two large video screens in the main hall. He spoke about religion and science and the relationship between the two. This was received at the end of the first day which also included a selection of posters.

Spinal Cord Injury: A poster session focussing on axon regeneration contained a large number of posters based around the use of small molecules and neutralising compounds to improve recovery following spinal cord injury. Of particular interest were two from Martin Schwab (University of Zurich) on anti-Nogo A treatment (a recurring theme throughout the week). They showed that delivering anti-Nogo-A treatment in non-human primates to increase the density of severed axons and improve the grasping action that built on their previous work. Timothy Himes (Drexel University) used a novel system to examine the regeneration of axons across the dorsal root entry zone (DREZ). Using Yellow Fluorescent Protein transgenic mice, where particular sub sets of neurons and their axons fluoresce without the need for immunocytochemistry, they were able to identify regenerating axons more easily. The opening day was to signal the start of a conference heavily subscribed with stem cell sessions, both posters and slide presentations. A particularly interesting poster from Angela Gritti (Institute for Stem Cell Research, DIBIT, Italy) showed the manipulation of human neural stem cells to obtain oligodendrocytes using EGF and FGF-2 *in vitro*, and then *in vivo* transplantation following focal demyelination injury these modified cells committed to an oligodendrocyte lineage.

Sunday began with a meander through a number of poster sessions (typically at opposite ends of the conference hall) including a number of posters on the glial scar and trophic factors following spinal cord injury. Where there are sessions on spinal cord injury there are always discussions on chondroitinase ABC and Sunday morning's session was no different. There were a number of posters examining the role of chondroitinase ABC as a treatment following spinal cord injury. One that particularly caught my attention was from Michael Zimber (Accorda Therapeutics) who was displaying some interesting data on delivering chondroitinase ABC systemically to spinally injured adult rats. This is obviously advantageous as systemic delivery is less invasive and although the data was preliminary, Michael was quick to assure the gathered audience that it appeared that systemic delivery of chondoitinase ABC was improving the recovery following contusion injury.

The afternoon's special lecture was given by Dave Ginti (Johns Hopkins University) on the growth and survival signals that control the development of the PNS. The lecture evolved around the key ligand-receptor signalling semaphorin family and the relationship with neuropilin which are important for axon guidance, observed using knockout and knockin transgeneic mice. There was also discussion on the NT3, required for the development and survival of sympathetic neurons and of NGF which acts as a feedback to suppress NT3 sensitivity thus manipulating axon growth. In the afternoon two particular sessions caught my attention. The first was a poster discussing the limitations of BrdU as a potential label of cells that are transplanted into the lesioned animal. Secondly, Hans Keirstead (University of California) gave a slide presentation based around his recent publication where they used human stem cells to improve demyelination following spinal cord injury. He showed that high oligodendrocyte populations were achieved following a 42 day differentiation protocol and identified integration and remyelination following contusion lesioning. Hans pointed out that stem cells need to be able to fulfil three criteria; neuroprotection, replacement and remyelination.

It was an early start to the Monday morning session as I was presenting my poster on neural progenitor cells failing to cause regeneration of sensory axons beyond the dorsal root entry zone; work I had undertaken as part of my PhD. Presenting the poster consumed the entire session. While I received feedback and constructive criticism from colleagues and peers it became impossible to visit other posters in the session. The afternoon was filled with a number of posters on neurogenesis. One in particular from Angelo Lepore (Drexel University) examined the long term fate of neural precursor cells where the cells had survived transplantation or at least 6 months and were still capable of differentiation. Early evening provided an opportunity to mingle with colleagues and potential employers at the "Spinal Cord Injury Social" chaired by Jerry Silver. This was accompanied by a brief motivational speech from Kim Anderson (University California, Reeve-Irvine Research Centre).

Once again Tuesday of the conference was filled with a number of interesting studies and, with never enough time, I chose the sessions that would benefit me in widening my scientific knowledge and expanding contacts. Perhaps one of the most interesting studies that was on display in the morning session was from Ravinder Pannu (Medical University of South Carolina) involving Atorvastatin, a cholesterol lowering drug, capable of reducing inflammatory molecules and myelin basic protein and significantly improving the BBB score. Although no axonal tracing had been performed the novel use of this drug and the fact that it is already in clinical use made for interesting discussion on its potential uses in the future.

The afternoon was punctuated by a large number of posters examining spinal cord injury models and cervical injury, many of the studies in the latter involved non-human primates and examined the functional deficits. One particularly interesting study involved the use of the heavy metal gadolinium to enhance the lesion site, which allowed for the injury site to be detected using MRI following long term spinal cord injury. This MRI work from Stanley Fricke (Georgetown University) was accompanied with good correlating histological analysis and provides an alternative method for visualising the lesion site following spinal cord injury. The evening incorporated the "Spinal Research Organisation Social", held in the plush setting of the casting and soundstage room of Hotel Helix, and the graduate and postgraduate party; both events allowed people to chat with colleagues and have fun in an informal setting away from the rigors of the conference.

The last day of the meeting was packed with as many interesting posters and presentations as the first. There were four sessions based around CNS regeneration. Once again the glial scar and other inhibitory components were at the forefront of the discussions, as were the use of scaffolds and hydrogels to promote functional recovery following spinal cord injury. One of the more novel studies from Larry Benowitz (Harvard Medical School) involved the use of hydrogels to release NT-3 slowly into the microenvironment following spinal cord injury accompanied with inactivating RhoA activity through gene therapy where they observed long distance axonal tracing suggestive of regeneration

Amongst all the posters was the vast array of company displays including amongst others Leica, Nikon and Abcam; even Apple had a stand. These stands allow the scientific community to talk to the people behind our antibodies and equipment, discuss refinements and possible future products that would benefit the way we work. Of particular interest was the Noldus Information Technology (Netherlands) who are marketing a novel piece of behavioural testing software known as Catwalk that I have had experience using with spinally injured adult rats which allows gait disturbances to be analysed.

SFN is perhaps the largest annual scientific conference that neuroscientists attend during their careers. For all the poster sessions and slide presentations that I visited there were another 10 that I would like to have visited but with such a large scale conference not everything can be achieved. The week spent in Washington D.C was both scientifically informative and accompanied by some very fine weather for November resulting in an enjoyable conference, one that I hope to attend again.

Daniel Webber, Department of Clinical Neuroscience, University of Cambridge

Northern Cell Biology Meeting
Manchester September 2005

The second North of England Cell Biology Forum was held in the Smith Building at the University of Manchester, on September 12, 2005.

This one-day workshop, which was generously sponsored by BSCB and also the Biochemical Society, featured talks by postdocs and PhD students from the Universities of Sheffield, Leeds, Liverpool, York and Manchester.

Four sessions, each chaired by postdocs or students, included fifteen talks representing a range of topics under the general theme of molecular cell biology and included biosynthesis of membrane proteins and quality control in the ER, constitutive and regulated secretion, endocytosis and the mechanisms by which signalling proteins are downregulated, cytoskeletal dynamics and motility. There were also talks on apoptosis in yeast and how the Golgi-associated phospholipase A2-alpha may be a good anti-cancer target. There was also a poster session, which was well-attended throughout the day and at the end when it was facilitated by beer and nibbles!

The quality of the presentations was very high and the increased participation of postdocs and students as session chairs appeared to act as a good catalyst for discussion. We are now confident that this workshop is established as an annual event with a forum planned for Sheffield in 2006 and Liverpool in 2007. Once again we were very appreciative of the support of BSCB, which allowed us to cater for approximately 80 attendees.
Liz Smythe, University of Sheffield

The ASCB 45th Annual Meeting
10–14 December, 2005, San Francisco

The 45th Annual Meeting of the American Society for Cell Biology was held this year at the Moscone Convention Centre, San Francisco and attracted approximately 10,000 scientists from across the world. Thanks to BSCB Honor Fell travel awards I was able to attend. By Anna Townley

I arrived in San Francisco a few days before the start of the conference which gave me time to get my bearings, adjust to the different time zone and take a trip to Alcatraz. The first day of the conference was an early start for me because I had volunteered to help with conference registration. This involved checking registration details and printing conference badges. For me this was an interesting start to the meeting as I was able to observe "behind the scenes" of the conference, something I am very interested in, as well as receiving a free ticket to the social event!

The opening night keynote symposium was entitled "Big Science, Little Science" and included talks by Linda Buck (Fred Hutchinson Cancer Research Center/Howard Hughes Medical Institute) about unravelling details of smell and Clare Fraser (The Institute for Genomic Research) speaking about discovery driven research. Following the keynote presentation was the Presidents opening night reception. This was well attended and also took place at the convention centre. It was a good start to the meeting and enabled people to meet up with old colleagues over food and a glass of wine.

The meeting really kicked off on Sunday. In the morning there was plenty going on with exhibitor showcases and a poster session boasting over seven hundred posters. Part of my morning was spent browsing the exhibitor stalls, my research involves the use of light microscopy to study the secretory pathway and so I found the Leica and Nikon stalls very interesting. The first set of minisymposia got underway in the afternoon. I attended a series of talks entitled "Cargo sorting and Vesicular Transport". James McNew (Rice University, Houston, TX) began the session with a talk about the function of t-SNARE complexes, work which had been carried out on the yeast secretory pathway. He described how protein mediated membrane fusion during endocytosis needs the regulated assembly of the t-SNARE complex. His research then investigated the role of the SSO1p N-terminal regulatory domain in membrane fusion *in vitro*.

The adapting to stress symposia on Monday morning began with an interesting and well illustrated talk by Tom Rapoport (Harvard Medical School/ Howard Hughes Medical Institute). His work aimed to determine how the characteristic shape of an organelle is generated and maintained, specifically the generation of the ER tubule network. *Xenopus* egg extracts were used as a model because when they are incubated at room temperature with GTP, networks of tubules are generated. He took the approach of using small inhibitors of ER network formation (sulfhydryl modifiers) and subsequently finding their targets, one of which was reticulon 4a. He found that in COS cells reticulon proteins localize to the tubular ER and overexpression depletes sheets and

enhances ER tubules. He speculated that perhaps reticulons are wedge shaped which would allow the protein to insert into the membrane and prolong membrane curvature to allow formation of tubules.

The poster sessions drew quite a crowd and were accompanied with popcorn and refreshments. I presented my poster on Monday, the first poster presentation of my career. It gave me the opportunity to present my current research and also to discuss it with researchers working on similar projects. It was also very interesting to look around posters displayed in my session because many were very relevant to my research.

The social event was held on Monday evening at the San Francisco Museum of Modern Art. This was a popular event held at a brilliant location, close to the conference centre. The social ticket allowed access to the gallery as well as a buffet and disco. The buffet was divided into food from different areas of the world, it was well presented and delicious! Although the art was not to my taste it was really fascinating to visit a modern art gallery and what better place to see it than San Francisco.

Tuesday brought another set of interesting minisymposia. I attended talks in both the organelle dynamics and protein misfolding and disease minisymposia, the rooms were just close enough to be able to run between them during the break of talks. Jesse Hay (University of Montana, Missoula) gave a fascinating talk on the assembly of vesicular tubular clusters by homotypic COPII vesicle fusion *in vitro*. The aim of his research was to determine the precise details of tethering and fusion of COPII vesicles in a test tube. By immunodepleting rab effectors such as p115 and gm130 they were able to show that COPII vesicle fusion requires these proteins.

Another highlight of the conference was the Keith R. Porter lecture presented by Randy Schekman (University of California, Berkeley) entitled "Morphogenesis of a transport vesicle". His work is extremely relevant to my research and it was a privilege to be able to attend one of his talks. A large audience attended his talk which focused on the transport of vesicular cargo between the endoplasmic reticulum and the Golgi in Saccharomyces cerevisiae, research he has focused on for many years. This presentation was extremely well delivered and beautifully illustrated with detailed electron microscopy images.

A couple more days of sightseeing were taken when the conference had closed. This included a cycle ride over the Golden Gate bridge, a walk to Pier 39 to see the sea lions and a ride on a cable car! As the conference was so close to Christmas I also took time to visit Macys to get started on my Christmas shopping.

Overall I really enjoyed my time in San Francisco and felt that the conference was a brilliant experience. I would like to thank the BSCB for the Honor Fell Travel award which enabled me to attend.

Anna Townley, Department of Biochemistry, University of Bristol.
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A trip to the ASCB Annual Meeting in San Francisco just before Christmas! For me a fantastic opportunity to see what is going on in my field, to present a poster, to network and meet up with friends and former colleagues. The Honor Fell Travel Award helped towards the expenses of this excellent trip. By Helen Dodson

Arriving at the ASCB in the enormous Moscone Conference centre in downtown San Francisco I felt like it might take 5 days to find my way around, discover the location of sessions that interested me, explore the massive exhibitor's hall or find that poster that I just 'must see'. With a total of nearly 10,000 delegates and a staggering 2852 posters plus over 500 late abstracts, arriving at the ASCB can seem a somewhat daunting experience. At a meeting this size I realised it was impossible to see everything, so I attempted to carefully select the sessions of most relevance to my research. Here, I have highlighted a few of the talks which I found personally most engaging and have tried to communicate the atmosphere of this impressive meeting in the exciting city of San Francisco.

My research interests are mainly control of the cell cycle, cell division and cellular responses to DNA damage. Therefore, I looked forward to Sunday's minisymposium entitled 'Regulation of the Cell Cycle', talks by Nate Portier (La Jolla, CA) shed further light on the role of Aurora A in centrosome maturation using RNAi in C.elegans, and Peter Sicinski (Harvard, MA) discussed the role of the G1 Cyclin D family members in breast cancer. Colin Clarke, (MIT, MA) described his work on the developed of free software called Cell Profiler which is designed to help cell biologists get the most from their microscopy data such as the automation of counting cells, check out www.cellprofiler.org for more information.

Monday brought another interesting afternoon minisymposium on 'Chromatin Dynamics' which focused on aspects of chromatin in both mitosis and meiosis. Abby Dernburg (Berkeley, CA) described HIM and ZIM proteins at pairing centres which are involved in marking different chromosomes so that they can synapse correctly, while Patrick Varga-Weisz (Cambridge University, UK) discussed the remodeling factor ISWI. Symposium V on Tuesday morning entitled 'Reprogramming Cell Fate' was opened by Sir John Gurdon (Cambridge University, UK) who discussed some of the aspects limiting mammalian nuclear re-programming. Helen Blau (Stanford University, CA) followed with a fascinating talk regarding cell fusion where she explored the phenomena of bone marrow derived cells fusing with other cells types and hypothesized that this could be a repair mechanism for cell types which are unable to regenerate, such as neurons.

For me the afternoon minisymposium 'Mitosis and Meiosis' co-chaired by my PhD supervisor Bill Earnshaw was a highlight of the meeting. The session was opened by Rebecca Heald (University of Californai, Berkeley, CA), winner of the Junior Women in Cell Biology Award. She talked about the non-motor microtubule associated protein Orbit in X.laevis and some recent work using the extracts from X.tropicalis, which has the advantages of a diploid, sequenced genome and showed that this organism is useful and tractable for both genetic and biochemical experiments. A former colleague of mine, Paola Vagnarelli (University of Edinburgh, UK) spoke about the phenotype of a vertebrate cell line lacking the condensin component ScII. The appearance of anaphase bridges has led to the suggestion that the DNA decondenses too early in this mutant before the completion of anaphase. This session was concluded by a talk from Iain

Porter (University of Dundee, UK) concerning the identification of novel kinetochore components in *Xenopus*. Around 150 proteins unique to the mitotic chromosomes were identified, the initial characterization of one novel kinetochore associated protein, Fam44B was described.

One of the more interesting and perhaps surprising aspects of the ASCB annual meeting is the staggering size of the exhibitor's hall. The fact that Invitrogen use a bus as the centre of their exhibition space may begin to convey something of the sheer scale of this area. There was an opportunity to see equipment set up and actually get a feeling for something that you might be thinking of buying. My supervisor and I were interested to check out new microscope systems and managed to have a trial run of some software being developed by Intelligent Imaging Innovations (3i). In addition, I was able to discuss some specific technical questions I had with Amaxa regarding their Nucleofector technology which we have recently started using. Some companies also run informative tutorials about their products. It was a bit of a squeeze to get into the very well attended Quantum Dots tutorial, but I did manage to find a little space on the floor. Another part of the exhibition hall was given over to the careers centre where employers can post job adverts and potential employees can leave CVs and arrange interviews. I personally was not job-hunting this year but, think it is a great opportunity to have at a conference and will keep it in mind for the future.

The arrival of Wednesday, the final day of the conference, was a hectic one for me with the early morning symposium VII 'Cell Growth and Division', followed by the personally highly relevant member organized symposia "Developmental Action of Cell Cycle Checkpoint' and finally my poster presentation in the session 'Centrosomes II'.

During the morning session Helen Piwnica-Worms (HHMI, MO) explored the role of Cdc25 phosphatases in normal cell cycle progression or when checkpoints are activated. She concluded with data from clinical trials where a combination of the drugs irinotecan (a TopoII inhibitor) and UCN01 (a checkpoint inhibitor) along with careful evaluation of the p53 status and cdc25 expression levels of tumours has led to an improved long term outcome for cancer patients.

The meeting was rounded off with my poster presentation session which was well attended and I was kept talking for the best part of two hours. I was lucky enough to be able to discuss my work with scientists working on closely related topics and get some useful comments, for example some great hints to get the best results from the live cell imaging experiments that I am undertaking, feedback on the work and requests for some of the fluorescently tagged fusion constructs I have generated.

During and after the conference I also found some time to explore the famous city of San Francisco and enjoy some of its many bars and international restaurants. Following the conference I drove to the spectacular Yosemite National Park with colleagues.

I would like to thank to BSCB for the Honor Fell Travel Award which contributed towards my expenses and allowed me to attend this highly enjoyable ASCB meeting in San Francisco.

Helen Dodson
National University of Ireland, Galway, Ireland

First International Conference on the Mechanics of Biomaterials and Tissues

11–16 December 2005 Big Island, Hawaii

With the aid of a travel grant from the British Society for Cell Biology, I attended the First International Conference on the Mechanics of Biomaterials and Tissues, on the Big Island, Hawaii. This new conference was designed to bring together materials scientists, biologists and engineers to provide a forum within which they could debate the difficulties of interfacing mechanical and medical requirements, with the aim of advancing understanding in all areas of bioengineering, as well as to look at how the lessons of engineering materials could be made relevant to the study of biomaterials.

There were 150 oral presentations and over 250 delegates from all over the world. Sessions covered biomaterials, spanning polymers, ceramics, tribology and the tissue interface, as well as the mechanics and fatigue properties of bones and soft tissues, cells and tissue engineering applications. With only two parallel sessions running at any time, each session was well attended and it was relatively simple to see all lectures of interest. My research field is tendon micromechanics. Tendon can be likened to a fibre composite material, in which extension is controlled by the relationships between the fibres and the surrounding matrix. The tendon structure repeats this interplay at a series of hierarchical levels, leading to the generation of highly complex local strain fields under the application of tensile loading. This has important implications for the cells and for tendon health, as the production and maintenance of the tendon

Above: some of the speakers from the tendon session. (From left to right: Myself; Dr Himadri Gupta, Max Plank Institute of Colloids and Interfaces, Germany; Professor Steve Arnoczky, Michigan State University; Professor Robert Ker, University of Leeds.)

matrix is highly dependent on the strains perceived by the cells. Accordingly, my research concerns the analysis and examination of the tendon strain response at different substructural levels, and investigating the mechanisms by which the composition and arrangement of the tendon matrix is able to control this. I felt this conference to be of particular relevance to me, as I am interested in considering the structure and function of tendon in the same manner as a material scientist, but then using this information to advance understanding of the biological processes and the cellular effects.

I was privileged to be invited to speak about my research interests within the tendon and ligament session of the conference, which was organised by Professor Robert Ker from the University of Leeds, UK. The session was well attended, and it was particularly pleasing to see a large number of materials scientists within the audience, for some of whom this provided a first introduction to tendon. The interest of people with different areas of expertise and the multidisciplinary nature of tendon research augurs well for the future advancement of the field.

Professor Ker began the session with a keynote lecture on the mechanics of tendon, providing an excellent overview of tendon, as well as detailing some of his work in tendon fatigue and providing a smooth introduction to the rest of the session. This was followed by another very interesting presentation by Dr Himadri Gupta, from the Max Planck Institute of Colloids and Interfaces, Germany. Using their expertise in X-ray diffraction, his group have produced a series of studies looking at tendon extension on a microscopic level, specifically examining the effects of strain on molecular spacing. This is particularly relevant to my studies, where I utilise different techniques to assess tendon extension behaviour. I chose to talk about the effects of strain at the fibre level of the tendon composite, presenting data looking at the influences of incubating samples in different solutions on matrix interactions, and the subsequent mechanical characteristics.

The session also included interesting presentations from Miss Deakin and Mr Subramanian, describing their PhD work on the mechanical properties of tendons, demonstrating some interesting new techniques for the analysis of tendon mechanics at a gross level. The session was concluded by an excellent talk from Professor Arnoczky, looking in more detail at the effects of cell deformation on tendon cells. He discussed the upregulation of different genes and proteins under the application of tensile load, looking at the effects of different loading frequencies and amplitudes, as well as the effects of damage on local gene upregulation within the matrix, demonstrating that tendon responds to its local mechanical environment in a very specific manner.

I was pleased with my presentation and felt it was well received, sparking some excellent discussion relating to the effects of sample incubation, and the mechanisms by which a multilevel fibre composite may respond to strain. I was delighted to have the opportunity to discuss this further with some of the delegates during the lunch break. I had an excellent discussion with Professor Willinger, from Strasbourg, who described how similar this strain response is to that seen in composite plastics. I was also fortunate to talk to Dr Pruitt from the University of California, who has been looking at the contribution of different structural components of the strength of aorta, using enzymatic digestion techniques similar to mine. Further discussion with Dr Gupta has also led to the possibility of future collaboration. With highly complimentary analysis techniques, we are already discussing the possibilities of a joint research grant application, combining these techniques to try and establish a complete overview of the tendon strain response.

The meeting also had the benefit of a superb location! Situated on the West coast of Hawaii's big island, the conference was held within a beach resort hotel. The island possesses an astounding array of different environments and wildlife, and I really enjoyed the opportunity to explore some of these also.

Overall, I felt this conference was very successful. Bringing together materials scientists with biologists and engineers provided interesting new insights into the mechanics of various biological materials, and how we may be able to relate our knowledge of materials to the biological world. I hope this conference will continue and will grow in strength, as it fills an important role in the multidisciplinary field of biomaterials and tissues.

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Membrane trafficking UK one day symposium 19 December 2005

For the third year running, members of the UK membrane trafficking community met in University College London for this one-day meeting organised by Dan Cutler (LMCB). An interesting and varied programme was provided by speakers from across the UK, coming from as far afield as Aberdeen. The 17 talks provided a snapshot of current research on membrane trafficking in the UK.

At one end of the spectrum, this research aims to answer fundamental questions common to all membrane trafficking processes, such as the work by Manfred Frick (LMB) on what affects the rate of lateral diffusion of proteins in biological membranes. Using FRAP (fluorescence recovery after photobleaching) techniques he concluded that the concentration of proteins in the membrane had more influence on the movement of proteins than the cortical cytoskeleton. At the other end of the spectrum, research is being targeted at highly specialised cells and specific disease states. Fraser Coxon (Aberdeen) has identified mutations in osteopetrosis patients that affect trafficking to the ruffled border of osteoclasts. This is helping to dissect the trafficking processes required for these cells to perform bone resorption during normal bone remodelling.

The interplay between intracellular trafficking and signalling was discussed by several speakers. Stephanie Kermorgant (CRUK) described work on the tyrosine kinase receptor c-Met and raised the possibility that trafficking of the signalling complex to the perinuclear region may aid the nuclear transport of the transcription factor STAT-3. Two talks on endothelial cells by Harry Mellor (Bristol) and Vas Ponnambalam (Leeds) covered different aspects of VEGF receptor trafficking, and their relevance to signalling function.

The talks also covered a wide range of phenomena specific to various organelles. Irmgard Hofmann (LMB) described an Arf-like GTPase (Arl) targeted to lysosomes, and proposed a role for Arl8 in lysosomal movement; the unusual shape of Weibel-Palade bodies was explained by Gregoire Michaux (LMCB) who showed why their elongated structure is essential to haemostatic function, and Jenny Gallop (LMB) discussed the role of endophilin in fast synaptic vesicle endocytosis.

The quality of the research and talks made for interesting sessions throughout the day. The meeting also provided a great opportunity for less formal discussion among nearly 250 attendees during breaks and at the evening reception.

Tim Pullen
LMCB, University College London

G Protein-Coupled Receptors: Evolving Concepts and New Techniques Keystone Resort, Colorado, February 2006

This focused symposium was held in the beautiful mountain resort of Keystone, Colorado, USA. Combining mountain sports and a lively conference programme at an altitude of 9500 feet, one couldn't help but be inspired if not a little out of breath!

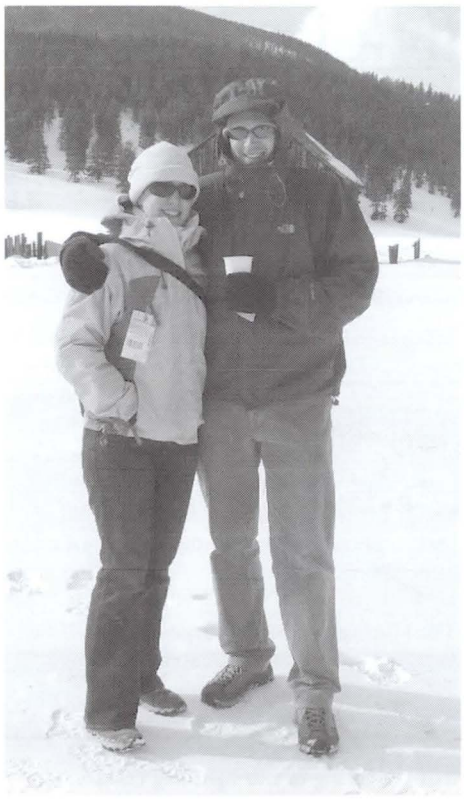
G protein-coupled receptors (GPCRs), which constitute one of the largest gene families identified in the human genome, also represent the largest number of current targets of therapeutic drugs. Topics covered in this symposium included GPCR structure and function, genetic identification of orphan GPCRs, novel receptor interacting proteins, mechanisms involved in receptor deactivation/desensitisation, and receptor targeting/action in signalling microdomains.

Unfortunately, I missed the opening day of the conference, being stranded in New York in the biggest snow blizzard they have had in a number of years! The morning session on this first day of the meeting focused on GPCR structure and included talks from Jean-Louis Banères (Centre National de la Recherche Scientifique) who spoke about the molecular mechanisms of activation of GPCRs. The afternoon session looked at GPCR/G-protein interaction, including a talk by Martin Lohse on studying GPCR activation by FRET. All of which I am told was very interesting!

I managed to arrive at Keystone late at night on the first day so I was up and ready to go for day two, even at such high altitude. The morning session covered one of the hot topics for the meeting, GPCR dimerisation. Susan

George (University of Toronto) presented evidence that the Dopamine D1 and D2 receptors, receptors from different dopamine receptor subfamilies with differential G protein coupling characteristics, heteroligomerise. The evidence presented suggested that the heteroligomer was activated by both D1 and D2 agonists, generateing a calcium signal via Gq/11. Susan pointed out that phenotypes of the D1 knockout mouse now need to be characterised in order to determine what proportion may be due to the heteroligomeric receptor rather than the D1 receptor alone. The afternoon topic was orphan GPCRs, a subject which seems to be becoming slowly unravelled. Ruben Abagyan (The Scripps Research Institute) presented an interesting technique using high-resolution crystal structures and computational modelling to predict binding pockets on GPCRs without knowing the ligand. These techniques are useful for 'de-orphanising' receptors but also to identify allosteric sites and alternative pockets that can be used for drug binding. In the evening, I presented my poster entitled 'Nuclear Localisation of the GRK4 subfamily of GRKs', at which I was kept very busy and enjoyed some interesting discussions.

Day three opened with a session on GPCR knockouts and mouse models. Paul Simpson (University of California, San Francisco) presented a revised paradigm for ·1-adrenergic receptor signalling which is essential for physiological cardiac growth and adaptation to stress. Currently, drugs for treatment of heart failure are poor, projecting a 4-year outcome of only 50% survival if patients are receiving treatment. He reported that cardiac ·1-adrenergic receptor signalling is adaptive and not toxic since the double ·1a/·1b knockout mice show worse pathological hypertrophy than wild-type littermates. The double ·1a/·1b knockout mice have smaller hearts than wild type and heart function is abnormal during exercise, with a particularly slow heart rate. Instead of increasing ,-myosin heavy chain (,-MHC) content whilst increasing myocyte cell size during disease stress (hypertrophy) as the wild type does, double ·1a/·1b knockout mice show increased myocyte cell size but no increase in ,-MHC. Thus, the knockout mice have enlarged myocytes with decreased contractility, suggesting that the ·1 adrenergic receptors are required for adaptive physiological hypertrophy.



Above: Laura and her husband Matt at the Keystone Resort

The afternoon session addressed GPCR desensitisation and turnover. Jeffrey Benovic (Thomas Jefferson University) described how ,-arrestin (,arr) binding to a receptor disrupts its polar core and allows it to bind to other molecules. He showed that IP6 can join ,arr2 into an oligomer by binding to the N-terminal tail of one ,arr2 molecule to the C-terminal tail of another. IP6 binding to ,arrestin does not prevent interaction with clathrin, ,-adaptin or ERK2. A ,arr2 mutant that does not bind IP6 is more nuclear in localisation, whereas wildtype is cytosolic in distribution, suggesting that IP6 may regulate the localisation of phospho-inositide binding proteins. Jeffrey also showed that ,arr2 and ,arr3 can homo- and heteroligomerise in cells. I presented a short talk during this session describing how the serine/threonine G protein-coupled receptor kinase 4 subfamily may have nuclear roles in addition to their well-characterised functions in receptor desensitisation. The GRK4 subfamily all contain functional nuclear localisation sequences. GRK5, a GRK4 subfamily member, also has a functional nuclear export sequence, which we would predict to be functional in the other subfamily members, GRKs 4 and 6. The GRK4 subfamily members also show differential DNA-binding *in vitro*. I also presented evidence which may suggest that GRK5's DNA binding and kinase activity are involved in development of cardiac hypertrophy in cardiac myocytes.

On the final day the focus was GPCRs in sensation, inflammation and human disease. Sheila Collins (CIIT Centers for Health Research, Research Triangle, North Carolina) dissected signalling pathways via the , adrenergic family of receptors, particularly ,3. These are involved in lipolysis and thermogenesis, both of which are impaired in obesity. p38 MAP kinase appears to have an essential role in mediating adaptive thermogenesis and ERK MAP kinase has an accessory role in the pathway for control of lipolysis. Sheila pointed out that these metabolic events were traditionally ascribed to the cAMP/PKA system and that this improved understanding of the signalling involved may provide new therapeutic targets for the treatment of obesity.

I thoroughly enjoyed this meeting which covered a diverse range of current topics. It was well organised, with time allowed for networking but also skiing/snowboarding and other winter activities which was a lot of fun! I would like to thank the BSCB for the Honor Fell Award which made it possible for me to attend.

Laura Johnson, MRC Laboratory for Molecular Cell Biology & Cell Biology Unit, UCL

Third international conference on Ubiquitin, Ubiquitin-like and Cancer.

M.D. Anderson Cancer Center, Houston, Texas, February 2006

I was very excited to be able to go to my first international conference. I thank the British Society of Cell Biology for giving me the opportunity to attend the Third International Conference on Ubiquitin, Ubiquitin-like protein and Cancer. The conference was at the center of the huge medical center in Houston. The meeting was held on the 11th floor in one of the five luxurious M. D. Anderson Cancer Center buildings. This meeting was honored by the presence of Avram Hershko, who was awarded the Nobel Prize in Chemistry in 2004 for the discovery of ubiquitin.

In the early 1980s, Aaron Ciechanover, Avram Hershko and Irwin Rose discovered one of the cell's most important cyclical processes, regulated protein degradation. This conference gave only a small but comprehensive insight into how much the field has evolved. As most (if not all) cellular mechanisms are affected by protein degradation via ubiquitination. This meeting also celebrated of the 10th year anniversary of the discovery of another ubiquitin-like protein called SUMO/Sentrin.

The meeting began with a focus on the discovery of new components of the ubiquitination and sumoylation process and understanding their mechanisms. Ubiquitination is a well-understood post-translational modification which generally leads to protein degradation. Yue Xiong (University of North Carolina, Chapel Hill, NC) presented his work on cullin proteins, a family of evolutionarily conserved proteins that assemble into potential numerous RING E3 ligase complexes. He discovered a novel Culin3 protein-interacting protein, p64. He found that cullin3 binds to the BTB domain of p64. He found that a large protein, CAND-1, is also required to hold the cullin complexes together. Wolfgang Dubiel (University of Medicine in Berlin, Germany) talked about the COP98 signalosome (CSN), a conserved multi-subunit complex involved in the regulation of the ubiquitin system. Many kinases are associated with the CSN to phosphorylate and degrade specific substrate, such as the tumour suppressor p53. They showed that CSN associated kinases phosphorylate p27 at C-terminal residues and lead to consequent degradation. Because the CSN is involved in the regulation of tumour suppressor stability, it becomes a potential target for tumour therapy.

During coffee breaks, I took the opportunity to know more about sumoylation. It seems that in the cell, ubiquitination and sumoylation can compete for same targets. While one condems the fate of the protein, the other one saves it. A good balance of both modifications must be crucial for accurate cell response. Multiple sumoylation generally modifies gene expression by targeting promoter-specific transcription factors, cofactors, chromatin modifying enzymes, and histones. However, in contrast to mono and poly-ubiquitination, mono-sumoylation has not been detected. There are four sumos (sumo1, 2, 3 and 4). Sumoylation is a dynamic process, as proteins are constantly conjugated and deconjugated. Dr Ronald T. Hay discussed the crystal structure of SUMO1 and 2 to understand why SENP1, a SUMO deconjugation enzyme, deconjugate SUMO1 better than SUMO2. He found that the interface of SUMO-2 and SENP1 has poor complementary, and most of the recognition is determined by interaction between the conserved C-terminus of SUMO-2 and the cleft in the protease. He also pointed the Fourier Transform Ion Cyclotron Resonance Mass Spectrometry (FT-ICR) as a powerful method to find new sumoylated substrate without the need to further validation for sumoylation. The importance of defining SENP1 function was further highlighted by Edward T. H. Yeh (The University of Texas, Houston, TX), the founder of this meeting. He already demonstrated the critical role of SENP1 in the regulation of the androgen receptor, c-Jun dependent transcription, and Cyclin D1 expression. Therefore, they looked whether SENP1 was involved in the pathogenesis of prostate cancer. They observed that SENP1 was overexpressed in prostatic intraepithelial neoplasia (PIN) and prostate cancer tissues but not in normal prostate tissues. Furthermore, SENP1 expression is induced by androgen and IL-6, two of the most important prognostic factors in prostate cancer. Transgenic mice over-expressing SENP1 in the prostate gland also developed PIN. Thus, SENP-1 could play an important role in prostate cancer pathogenesis.

Michael Matunis (Johns Hopkins University, Baltimore, MD) showed that inhibition of sumoylation resulted in a severe chromosome segregation defect and persistent activation of mitotic checkpoint. Cells in which SUMO modification was inhibited arrested in prometaphase with large numbers of lagging chromosome pairs that failed to congress at the metaphase plate. This chromosome congression defect could be linked to a defect in kinetochore-microtubule capture. It seems that SUMO modification is essential for chromosome segregation and that modification of multiple, distinct proteins regulate progression through multiples stages of the cell cycle.

Novel protein tags, such as Nedd8 and ISG15 were also up to date. ISG15 conjugation is highly induced by interferon stimulation and during viral and bacterial infections. This suggests an important role of protein ISGylation in innate immune responses against infection, cancer and other stresses. To understand better the role of ISGylation, Dong-Er Zhang

(The Scripps Research Institute, La Jolla, CA) created two knockout mice targeting ISG15 deconjugating enzyme UBP43 and activating enzyme UBE1L genes. He found that UBE1L and protein ISGylation are not critical for type I interferon signaling via JAK-STAT activation. However a lack of UBP43, but not increase of protein ISGylation, is related to the enhanced Type I interferon signaling.

The last sessions dealt with potential new target therapies for cancer, including the successful proteasome inhibitor, Velcade, an FDA approved drug for the treatment of multiple myeloma. Gregory R. Mundy (University of Texas, San Antonio, TX) suggested that the success of Velcade may be due to both its effects on osteoblasts to change the bone environment as well as its effects to cause direct myeloma cell apoptosis, probably related to the inhibition of NF-k, activity.

The conference had 48 talks and 3 break-out sessions (shorter talks in 3 separate groups). During the Thursday break-out session, I gave 15 minutes talk suggesting the potential role of WWP1, an E3 ubiquitin ligase, as a potential oncogene in breast cancer. My presentation was followed by Ceshi Chen (Albany Medical College, Albany, NY) who also works on WWP1 and confirmed our findings in breast and prostate cancer. Before hand, I was already interested in his work, which shows the regulation by WWP1 of KLF5, a potential tumour suppressor in the breast. I was glad to be able to meet and talk with him.

We had many opportunities during the meeting to meet new people, exchange our views on our work and general insight of our research. We also talked about heated subject such as the differences in work and life style in Europe and America, which I enjoyed very much. I'm very grateful to the British Society of Cell Biology for funding this great experience.

Ngoc-Sa Nguyen Huu, University of Manchester.

50th Biophysical Society meeting
Salt Lake City, February 2006.

Thanks to an Honor Fell Travel award from the BSCB, I was able to attend the 50th Biophysical society meeting that took place in Salt Lake City, Utah from 18th –22nd February 2006. This five day conference was staged in the highly impressive Salt Lake City Convention Center, attracting around 5700 researchers, with 80 platform sessions and over 2300 posters.

After an eight hour flight from London Heathrow to Chicago, and a four hour delay waiting for our connecting flight to Salt Lake City, we were relieved to finally be in our hotel room at the Radisson Downtown, conveniently situated next door to the conference venue. The surrounding mountains provided a beautiful setting for the meeting which, on my first visit to the USA, I was lucky enough to attend.

The first day consisted of numerous subgroup meetings including the Motility group. This kicked off with Michael Rosen (HHMI, USA) who spoke on the role of structure on the function and regulation of formins, essential for actin filament formation. He described a model of processive capping where these dimers bridge three actin monomers, initiate actin filament formation and subsequently move along the polymerising actin filament. Also during this session Lois Weisman (University of Michigan, USA) described how using a cross discipline approach which included yeast genetics, biochemistry and X-ray crystallography, her group has characterised separate regions of the cargo binding domain of a budding yeast type V myosin, Myo2, responsible for independently binding vacuoles and secretory vesicles. Her studies also suggest that other areas of the cargo binding domain are responsible for binding to distinct cargoes. Finally in this session Fabienne Plather (University of Geneva, Switzerland) explained how the study of photosynthetic intracellular parasites, such as Apicomplexans, has increased the number of known classes of myosin to twenty six.

For me the highlight of the second day was the Myosin and Myosin Motor Protein platform session as this was most relevant to my own research. This session included a number of excellent talks including those by Hyokeun Park (University of Pensylvania, USA), David Altman (Stanford University, USA) and Dan Mulvihill (University of Kent). Hyokeun Park described how the cargo binding domain of myosin VI, a minus end directed motor, induces dimerization. David Altman agreed, describing how myosin VI oligemerizes on endocytic vesicles, with the coiled coil domains of the motor proteins interacting producing a homodimer. My PhD supervisor Dan Mulvihill then presented data on the neck domain independent movement of the fission yeast type V myosin, Myo52. Also within this session were talks by Alexander Dunn (Stanford University) on tracking single gold nanoparticle-myosin V conjugates using darkfield imaging, and by Tomonobu M. Watanabe (Tohoku University, Japan) on the stepwise movement of motors in living cells.

The Actin, Microtubule and their Binding Proteins platform session on the third day saw Enrique de la Cruz (Yale University, USA) describing the effect of cofilin on actin tension. Cofilin co-operatively binds to the actin, twisting the actin filaments and creating an increase in torsion between subunits, which eventually leads to actin filament breakage. Akihio Narita (Harima Riken Institute, Japan) later gave an overview on the structure of filamentous actin and the capZ complex solved by X-ray crystallography and identified the residues responsible for this binding. CapZ, present in lamellopodia and also in the muscle anchor muscle of Z lines, binds to the barbed end of actin stopping elongation and depolymerisation.

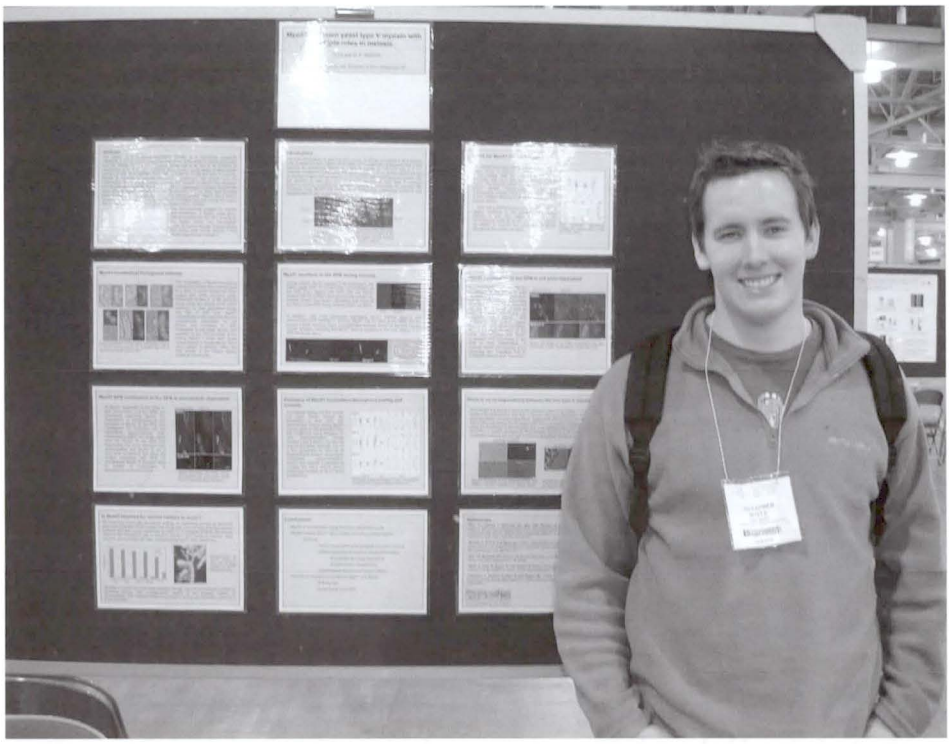
During the Actomyosin Interaction symposium on the penultimate day, Takuya Okada

(Osaka University, Japan) gave an interesting seminar on how single myosin V and VI heads step along actin filaments with ~5.5 nm steps. He described how myosin V takes between one and seven of these mini-steps per ATP cycle before taking the full 36nm step. He then went on to describe how monomeric Myosin VI also takes these steps, however it hops along actin as monomers on vesicles.

Also during this session Jennifer Klein (University Minnesota, USA) described the myosin II actin binding cleft as not just opening and closing but having a much larger degree of flexibility in it's movement.

Claire Waterman-Storer (Scripps Instititue, USA) gave an inspiring talk during a symposium titled Visualising Molecular Function in Living Cells on how she developed a technique called Fluorescent Speckle Microscopy (FSM). This technique involves GFP labelling of a low fraction of the actin within cells so the signal appears speckled and it is possible to observe actin moving within the cell with greater resolution. Now her group is using this technique to track actin in co-localisation with other focal adhesion proteins.

The final days talks concluded with the Myosins:Diversity and Mechanism symposium where Richard E. Cheney (University North Carolina) described the intrafilopodial motility of myosin X, how it is presence promotes filopodial growth and how it is a component of the tip complex.

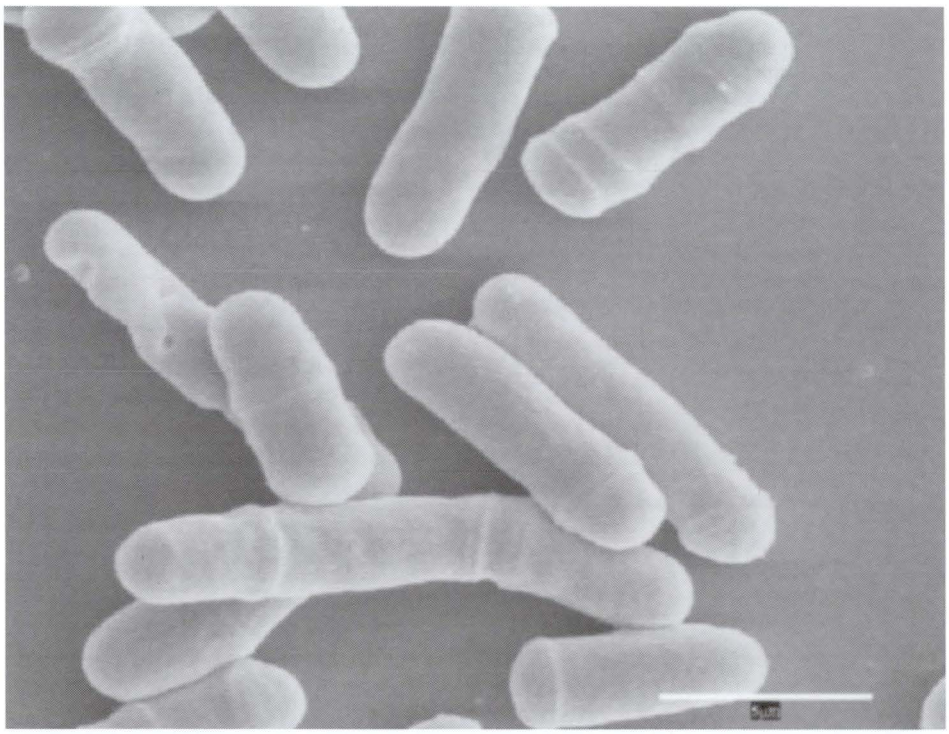


As well as the conference, we also found time to hire a car and explore Arches National Park, a mere five hour drive away, as well as trying to break the land speed record in a Ford Focus on the Bonneville Salt Flats. I would like to thank the BSCB and also the BBSRC for providing me with the funding allowing me to attend this conference.
Alex Doyle, University of Kent. (above, with his poster)

2006 European Fission Yeast Meeting
Sanger Centre, Hinxton, March 2006

For this year's European meeting, Jürg Bähler took on the onerous task of bringing 250 fortunate participants to the Sanger Centre in Hinxton. With the support of the Wellcome Trust and other funding bodies including CRUK, many participants came from Asia and USA, to this heavily oversubscribed meeting. None were disappointed as they participated in 3 days of intense science with 40 12-minute talks. Numerous post-docs and students were given the chance to present their work and an evening was dedicated to a stimulating poster session.

The fission yeast *Schizosaccharomyces pombe* has occupied a key place in modern cell biology as a model organism. This has led not only to the famous contributions such as the Nobel prize winning discoveries of Paul Nurse and colleagues in cell cycle research but has underpinned advances in many fields, including cell morphogenesis, differentiation, gene switching/silencing and the underlying chromatin modifications. However fission yeast tends to loose the limelight to the most extensively studied budding yeast. Fission yeast is more comparable to mammals than budding yeast in several areas, yet each system has its own advantages for the analysis of certain problems. For example, the properties of heterochromatin and regulation of commitment to mitosis are more tractable in fission yeast. However, the comparative analysis of the two yeasts, spectacularly facilitated by genome sequencing, far outstrips the impact of studies in one system alone. The excitement in the field has driven the community to instigate a series of tri-annual meetings



Above: *S. pombe*. Image courtesy of Prof. Rosa Aligué Alemany, University of Barcelona, Spain

(San Diego in 2004, Copenhagen in 2007) with regional interim gatherings in the USA and Europe.

Fission yeast genome database and resources

The meeting started with a one-day computing workshop directed by Val Wood and Jürg Bähler (Sanger Institute). The Sanger Genome Database for fission yeast was thoroughly described. It comprehensively integrates sequence alignments, the data from widespread genomic-wide studies, and the literature as well as cross-referencing with other databases. Remarkably, this database has effectively been run by Val Wood on a series of soft funding for the past ten years. Nevertheless it is providing an increasingly detailed and accurate annotation of the fission yeast genome. Further enrichment of the database should provide more robust frameworks of analysis and hence should prove essential in moving the fission yeast community forward.

This underlined a potential crisis for this model organism and prompted a lively discussion, led by Paul Nurse (Rockefeller Institute, USA), on the first night. Despite the great impact of fission yeast on the understanding of basic processes in biology, it has proven difficult to raise the support necessary for large-scale genome exploitation through database development and transcriptome/interactome programmes. Even the basic molecular biology to develop inducible vectors has not been supported. Hence this animated debate raised awareness on the critical need for more funding to develop resources and to make sure that *S. pombe* does not lose out in taking advantage of the latest advances in proteomic analyses.

Gene expression control

Fission yeast – just as the Sanger Institute itself – is very well anchored in its post-genomic era. This session highlighted the expanding research carried out through genome-wide studies. Global trends in translational control were talked about by Daniel Lackner (Sanger Institute): he could observe bias in terms of mRNA length in relation to ribosome density. This should prove useful in complementing the available expression profiling data from DNA micro-arrays. His presentation was the first of a series of talks illustrating the latest advances in transcription programs.

The talks of Anthony Wright (Karolinska Institute, Sweden) and Assen Roguev (The University of Technology, Dresden) both included comparative genome-wide studies between the distantly-related fission and budding yeasts and provided information on conserved cores and modes of evolution in transcription regulation. Anthony Wright correlated a structurally conserved co-regulator to diverged expression programs in both yeasts in adaptation to stress. This reinforces the view that flexible interactions of activator proteins with co-regulators could represent a process on which evolution impinges: to direct differential gene expressions in different species. Interestingly, in relation to the recently identified link between RNAi and heterochromatin assembly, Karl Ekwall (Karolinska Institute, Sweden) showed the requirement of a specific subunit of RNA Pol II for transcription from a pre-siRNA promoter.

Cell cycle

Errors in the processing and detection of stalled DNA replication forks can be linked to human diseases and gives predisposition to cancer. There were some interesting presentations on the potential means by which such stalled forks are processed.

In a meticulous study, Chris Norbury (University of Oxford) implicated a DNA helicase in a pathway that followed stalled DNA replication forks and gave insight into its regulation at a post-transcriptional level. Benoît Arcangioli (Pasteur Institute) used the mat1 locus imprint in different mutant backgrounds to study the role of homologous recombination at a broken replication fork. Kenichi Mizuno (University of Sussex) presented work using an inducible palindrome system that was developed to analyse chromosomal rearrangements arising from aberrant homologous recombination.

In terms of response to DNA damage, Paul Russell (Scripps Research Institute, USA) described independent modes of recruitment of Crb2 to DNA damage sites. Also, Anna Hebden (CRUK London) presented a novel mechanism of DNA damage survival in a telomerase mutant, probably acting through the amplification of sub-telomeric sequences. To execute division in favourable conditions, a cell has to ensure that each step of division is complete and properly co-ordinated. In addition the size of the cell and the rate of division have to be co-ordinated with the environmental conditions. While relatively little has been known about the coordination of cell division and cell growth with the environment, *S. pombe* is beginning to yield its secrets.

Using iTRAQ, Jérôme Wuarin (University of Dundee) identified proteins that control ribosome synthesis on the basis of their affinity

for Cdk1. Mutants for some of these genes displayed cell cycle defects that were, in some cases, rescued by Cdk1 activation. Hence it showed that ribosome synthesis is involved in the regulation of Cdk1 for entry into mitosis.

Looking at cell size is another way to look at cell growth. Janni Petersen (University of Manchester) described how the MAP kinase stress-response pathway coordinates cell division with cell size. The conserved MAP kinase Spc1/Sty1 was activated in response to changes in nitrogen source, which led to the Spc1/Sty1-dependent phosphorylation of polo kinase that then promoted mitotic entry. More insight into the Spc1/Sty1-dependent stress response was discussed in talks by Clare Lawrence (Paterson Institute, Manchester) and Alison Day (University of Newcastle).

Whether monitoring of the spindle position constitutes a proper checkpoint for progression into anaphase in the long rod-shaped fission yeast cell was hotly debated. Conflicting views were presented: whereas John Meadows (National Institute for Medical Research) used a mutant to tackle the question, Iva Tolic-Nørrelykke (Max Planck Institute) employed a novel technique of optical tweezers in combination with live imaging to address the role of nuclear positioning in the specification of the division plane. The metaphase to anaphase transition was also looked at in terms of Anaphase-Promoting Complex and separase activities. New APC substrates and receptor sites were studied using a site-specific phospho-crosslinking technique in Hiro Yamano (Marie Curie Research Institute)'s communication.

Excitingly, Koji Nagao (Kyoto University, Japan) reported the characterisation of a new essential domain in securin that is proposed to inhibit separase activity as a pseudo-substrate. In terms of progression through meiosis, Yuko Tonami (Nagoya City University, Japan) described sequences involved in the transcription of wee1+ and cdc25+ specifically prior to meiotic entry.

Cell morphogenesis and cytoskeleton

With its linear growth and medial fission, *S. pombe* naturally lends itself to the study of the mechanisms that control cell morphogenesis and spatial organisation. The issue of how a cell activates a new site of growth was discussed by Stefania Castagnetti (CRUK London). In addition to the role played by microtubule-mediated delivery of the polarity protein Tea1, she could observe an inhibitory action from existing growth zones. A careful characterisation of Peg1, a conserved microtubule-end binding, was reported by Agnes Grallert (Paterson Institute, Manchester). Mainly using live imaging and looking at microtubule dynamics, she showed that CLASP could regulate microtubule dynamics in the absence of any input from its binding partners Tip1 (CLIP170) and Mal3 (EB1).

The Sanger Campus offered a quiet and inspiring environment for the meeting. The dynamism of the fission yeast community was very well reflected by the quality and diversity of the research presented. This meeting again highlighted the diverse advances brought by studies with this model organism but also stressed the challenges faced by the community in terms of funding and resource development. The next meeting in Copenhagen in 2007 is eagerly awaited by all. I am grateful to the BSCB for the Honour Fell Travel Award that covered the cost of the meeting attendance, and I apologise to the researchers whose work could not be cited due to space constraints.

Daphne Garcin, Paterson Institute, Manchester

52nd Meeting Of The Orthopaedic Research Society, Chicago, March 2006

Thanks to the generous support of the British Society for Cell Biology through an Honor Fell Travel Award, I attended the 52nd meeting of the Orthopaedic Research Society which took place at the McCormick place lakeside convention centre in "The Windy City" of Chicago from the 19th-22nd March.

The annual meeting of the Orthopaedic Research Society is a highlight in the calendar of scientists working towards tissue regeneration strategies, connective tissue physiology, pathology and novel biomaterial development. Consequent to its popularity, the record attendance of more than 3100 delegates must have posed an organizational challenge, particularly considering the late re-location to Chicago from New Orleans following the devastation caused by a hurricane. The challenge, however, was met by the organising committee with a resounding success.

My personal aim for this trip was primarily to present my recent research finding in an international setting. I also hoped that being a finalist for the New Investigator Recognition Award of the ORS would raise the profile of my work, helping me to interact with, and put a face to, some of the leaders in orthopaedic research. It was the fellow contributors that really made the meeting for me, however, with the exceptional quality and ingenuity of current research presented throughout this multidisciplinary meeting.

The meeting commenced with 4 concurrent early morning workshops on both Sunday and Monday, each with 3 invited speakers. Fortunately, the time difference between London and Chicago made the 7:00 am transport from downtown to the convention centre a little easier to catch after a long haul flight!

The Regenerative Medicine in Orthopaedic Surgery workshop chaired by Johnny Huard (Pittsburgh, PA) on Sunday morning was quite inspiring. This workshop reviewed current techniques in tissue engineering and the potential application of muscle derived stem cells in healing of the musculoskeletal system. The resistance of muscle derived stem cells to oxidative stress, which is a feature of the wound site environment, was highlighted in relation to the enhanced regenerative properties of these cells. In addition, the develop-

ment of cell-instructive polymers (David Mooney, Boston, MA) was discussed with respect to the localised presentation of adhesion ligands as a strategy to control tissue regeneration in three dimensional systems.

On Monday I attended the workshop "Nanobiomaterials: Applications in Orthopaedics". In this workshop the influence of nanophase materials on protein adsorption and the consequential modulation of select mammalian cell function were discussed (Rene Bizios, Troy, NY) with emphasis on the underlying molecular mechanisms.

In addition, Rocky Tuan (Bethesda, MD) presented an overview of the design and development of biodegradable nanofibrous scaffolds designed to mimic the native extracellular matrix of orthopaedic tissues. Tuan described the "electrospinning" technique developed by Li. This is a process of controlled flow rate, viscosity and electric field whereby a continuous stream of polymer solution may be sprayed, the desolvation of which leaves a mesh of nanoscale polymer fibres. He reported that cells perceive the nanofibres quite differently to microfibres and flat surfaces and respond with differences in proliferation, serum dependence morphology and integrin expression. Furthermore, the incorporation of bioactive molecules and respective excipients into the polymer solution prior to spinning provides addition means of modulating cell behaviour to enhance tissue regeneration.

The workshops were followed by paper sessions and with 4-5 parallel sessions there was a wealth of highly pertinent presentations to attend. As a cell biologist with a background in cartilage tissue engineering, I found the sessions on "emerging technologies in cartilage research" and "cell signalling and chondrocyte behaviour" particularly interesting. Indeed, following the latter session, I was fortunate to meet with one presenter and his colleague to discuss a potential collaborative project that brings together our respective expertise in the UK and USA in a novel study.

Posters were displayed throughout the meeting, from Saturday afternoon to Tuesday evening. This permitted casual viewing during lunch-breaks in addition to the highlighted poster sessions which provided the opportunity to meet with the authors. The quality of work on display in the poster sessions was exceptional, possibly due to the highly competitive nature of this high profile meeting.

As a presenter and NIRA finalist, I manned my poster "Superficial and Deep chondrocytes both express the Crabtree effect but exhibit differences in oxygen consumption rate" during the first hour of each the two-hour poster sessions. These sessions instigated discussions between myself and other researchers from both the UK and the USA on the methodological challenges and solutions with respect to measuring reactive oxygen species in highly resistant cell populations, which include both chondrocyte and stem cell types. Researchers from Oxford were also curious about the technique that I have developed for monitoring oxygen tension in hypoxic chondrocyte suspensions and their questions helped me to identify further investigations of importance.

On a lighter note, the President's address was most enjoyable, exploring the life and work of the surgeon, John Hunter, of whose many anatomy specimens are on display at the Hunterian Museum of the Royal College of Surgeons in London – well worth a visit.

The final day of the ORS meeting traditionally overlaps with the meeting of the American Association of Orthopaedic Surgeons in an ORS / AAOS combined day and 2006 was no exception. The paper sessions in the ORS / AAOS combined symposia tended to be of a more clinical nature, including numerous case studies utilising the many biologics that are becoming available to surgeons for enhancing tissue repair such as autologous cell therapy for augmented healing of non-union fractures. In addition to the paper sessions, the exhibits of the altogether much larger AAOS were also open to ORS delegates. The number and scale of these exhibits was impressive, ranging from power tools for orthopaedic operations to an entire staffed autologous cell therapy laboratory ready and available for purchase and setup on hospital roof-tops! The combined ORS/AAOS sessions concluded the meeting on Wednesday leaving the afternoon and evening free to explore the city of Chicago before the return journey.

Overall, the meeting was both informative and inspiring (if a little exhausting!). I would like to take this opportunity to thank the BSCB for the Honor Fell award that made it possible to travel to Chicago in order to present my work at this meeting.

Hannah Heywood Cell and Tissue Engineering laboratory, Department of Engineering, Queen Mary, University of London.

BSCB meeting on Stem Cells York, March 2006

A timely gathering of significant players in the stem cell (SC) field convened at York University in March at the invitation of Tariq Enver and Roger Patient on behalf of the BSCB.

The programme opened with a plenary talk by Ron McKay (NIH, USA), one of the pioneers of neural stem cells (NSCs) and one of the few working on basic aspects of SC biology through to functionality and clinical utility. He gave an historical perspective on the state of the field, pointing out that the impression that it is too crowded is lessened when one breaks it down into the precise questions being addressed.

Using real time imaging of *in vitro* SC cultures, he challenged the linear hierarchical view of lineage decision making by NSCs. His presentation culminated in the exciting progress being made in the differentiation of embryonic stem cells (ESCs) into dopaminergic neurons, with its implications for degenerative diseases such as Parkinson's.

The developmental theme continued in the first session proper when the genetic circuitry driving differentiation in the early mouse embryo was described and exploited for the differentiation of ESC.

Janet Rossant (Toronto, Canada) and Liz Robertson (Oxford) described the development of extra-embryonic tissues (trophoblast/placenta) and the primary germ layers. Somewhat counter intuitively, Janet Rossant showed that the epiblast and primitive endoderm are apparently specified from the inner cell mass in a salt and pepper fashion and subsequently sorted out. She presented a network of regulatory interactions controlling trophoblast SC formation.

Liz Robertson described how the induction of mesoderm and endoderm depends on graded exposure to nodal signaling, which corresponds to a graded concentration of phosphorylated Smad2 and 3. Interestingly, she showed that the co-activator, Smad 4, is most critically required at the higher end of the gradient.

Gordon Keller (New York, USA) and Shin-ichi Nishikawa (Kyoto, Japan) described how our knowledge of the developing embryo can guide the choice of conditions for the differentiation of ESC. They demonstrated controlled differentiation into, and derived molecular signatures for, mesodermal (blood and cardiovascular), endodermal (liver and pancreas) and neural crest tissues using appropriate combinations of activin, BMP and Wnt signaling.

The second session explored the conditions for SC self-renewal both in and out of the niche. Austin Smith (Edinburgh) demonstrated this for ESC and for NSC, whether isolated *in vivo* or derived from ESC, using defined cytokines. The success in culturing these SC types contrasts with haematopoietic stem cells (HSCs) which renew very little *in vitro*. He also showed that fusion of ESC and NSC could restore pluripotentiality to NSC nuclei, and that this was more efficient if the ESCs expressed elevated levels of the gene, Nanog.

Andrea Brand (Cambridge) highlighted genes in the fruit fly that regulate cell division in NSCs versus their differentiated progeny and showed how damage can trigger further division to replace lost neurons.

P Ladurner (Ghent, Belgium) reported that flatworms contain pluripotent SCs which can repair or regenerate all tissues in the body. Andreas Trumpp (Epalinges, Switzerland) showed that c-Myc-deficient HSCs self-renew and accumulate due to their failure to initiate normal SC differentiation. Impaired differentiation of c-Myc-deficient HSCs is linked to their localization in the differentiation preventative bone marrow niche environment, and correlates with up-regulation of N-cadherin and a number of adhesion receptors, suggesting that release of HSCs from the SC niche requires c-Myc activity.

Finally, Takashi Shinohara (Kyoto, Japan) has established culture conditions for male germ cells which has major implications for transgenesis in the rat, an organism favoured for their size and physiology for studies of the brain, for example, and one that doesn't lend itself to transgensis by the methods used for mice.

The third session dealt with epithelial SCs, including their growth and clinical uses. Yann Barrandon (Lausanne, Switzerland) reminded us how clinically important epidermal SCs are in grafts for burns and went on to discuss the location of corneal SCs under normal versus conditions of extreme damage.

Fiona Watt (London) described how the level and duration of Wnt/beta-catenin signaling determines lineage choice between hair follicles, sebaceous glands and interfollicular epidermis in skin SCs. However, whether the SCs or the transit amplifying cells are the main source of cells in the epidermis was questioned by Phil Jones (Cambridge) using *in vivo* clonal marking (as opposed to the more common transplantation approach), thereby determining cell behaviour in their normal environment.

In contrast to the roles of Wnt signaling in epidermis, Alan Clarke (Cardiff) demonstrated that Wnt signaling controls proliferation as opposed to differentiation of intestinal SCs. RJ Kemp (Cambridge) showed that loss of beta1 integrin has opposing effects on intestinal SCs and their differentiated progeny with the differentiated cells becoming detached and undergoing apoptosis, while the SCs remained attached to the basal membrane and underwent proliferation.

Finally, Barry Stripp (Pittsburgh, USA) pointed out that lung epithelial SCs have a non-classical cellular organization and molecular hierarchy compared to those described for the gut and skin.

The fourth session on HSCs, unusually for this SC, concentrated on lineage decisions, either during their formation or their differentiation. The striking conservation of the genetic circuitry was beautifully illustrated by the Borden Lecturer, Uptal Bannerjee (Los Angeles, USA), and Lucas Waltzer (Toulouse, France), who described the cellular and molecular hierarchies involved in the formation of blood in the fruit fly.

Roger Patient (Oxford) drew out the homologies in fish and frogs, illustrating how the ability to monitor the consequences of lost function on a large scale in these organisms can permit the building of genetic regulatory networks.

Ana Cumano (Paris, France) showed how these lineage hierarchies are paralleled in the pre-liver mouse embryo. She led a detailed discussion with the audience concerning the existence of haemogenic endothelium as the source of the first HSCs.

Finally, P Garcia (Birmingham) showed how a SC regulator gene, c-Myb, can affect lineage decisions taken by the HSC. The HSC theme continued the next morning when Tariq Enver (Oxford) described a mathematical model to explain how cross-repression and auto-regulation of key transcription factors could maintain a stable SC state. When two SCs choose different fates they must of course diverge at some point in their transcriptional profile, but interestingly microarrays showed that they initially travel together, undergoing the same transcriptional changes over the first 24 hours. This implies that there is a common transcriptional programme for loss of potency that can be uncoupled from specific differentiation programmes. One gene, Nov, which is downregulated as cells journey towards commitment, was functionally tested though gain-and loss-of function experiments, and does indeed fit the criteria of a key regulator of the SC state.

The final session of the meeting was dedicated to exploring the darker side of SCs, namely their involvement in cancer.

John Dick (Toronto, Canada) gave the CRUK-funded lecture and explained that cancers, like normal adult tissues, are sustained by cancer SCs. CSCs are thus SC-like in their potential, but whether they always arise from the transformation of normal SCs, as documented by Dick and Dominique Bonnet (London) and colleagues for acute myeloid leukaemia, or can in some instances arise from later differentiation stages such as progenitors remains an open question and may be different in different tissue and disease settings.

Indeed, Brian Huntly (Cambridge) presented compelling evidence that some leukaemia associated oncogenes could generate a transplantable cancer from committed progenitors. These considerations emphasise the importance of delineating and comparing normal and malignant cellular differentiation hierarchies in all cancer prone tissues.

In the spirit of defining novel differentiation hierarchies, Dominique Bonnet presented evidence for a mesenchymal SC with a very broad developmental potential, and J Stingl (Vancouver, Canada) and KE Sleeman (London) presented recent advances in the identification of mammary stem and progenitor cells. Stingl identified a mammary SC population and dramatically demonstrated the capacity of a single prospectively identified cell to regenerate an entire mammary gland in a mouse transplant model. Sleeman dissected the hormone responsiveness of different compartments within this tissue and showed that the SC compartment itself is not hormone responsive: something which has clinical implications in the context of hormone-responsiveness of breast cancers.

An understanding of CSCs is more broadly important in a therapeutic context since unless these cells are eliminated cancers will inevitably grow back and John Dick explored this theme successfully targeting leukaemia SCs with an antibody-based approach.

Roger Patient and Tariq Enver

Acknowledgements
Thanks to Ronja Bahadori, Aldo Ciau-Uitz, Dave Cleaver, Claire Fernandez and Maggie Walmsley, who took excellent notes!

BSCB / RMS Joint meeting
Imaging Membrane Dynamics: Visualization of Trafficking Pathways
14–17 September 2006, Royal Holloway University of London, Egham, Surrey

Much of our knowledge of membrane trafficking pathways stems from seminal electron microscopy studies followed by molecular dissection using yeast genetics and biochemical reconstitution assays. Our knowledge of these pathways has been augmented by further developments in microscopy including the ability to reveal the spatial and temporal dynamics of membrane traffic in real time using live cell imaging.

This meeting, organized jointly by the **British Society for Cell Biology** and the **Royal Microscopical Society**, is intended to bring together those working on all aspects of membrane trafficking with particular reference to the application of cell imaging techniques.

Organizers: David Stephens and Rainer Duden

Registration and abstract submission are open; please note the early registration and abstract submission deadline of 31st July.
En suite accommodation will be at the beautiful **Royal Holloway College** and will be included within the registration fee for the meeting.

Full details:

www.rms.org.uk/event_imagmemb.shtml

Thursday 14 September

13.00 – 14.00 Arrival and registration

Session I: ER export

Chair: R. Duden

14.00 – 15.40 **Catherine Rabouille (Utrecht, NL)**
Early secretory pathway function
Speaker selected from abstracts
Ben Glick (Chicago, USA)
Dynamics of the Early Secretory Pathway

16.00 – 17.00 **2006 Hooke Medal Lecture**
David Owen (Cambridge, UK)
Structural analysis of clathrin coat formation

17.15 – 18.15 **Plenary Lecture**
Jennifer Lippincott-Schwartz, USA
Membrane compartmentalization and protein dynamics in the early secretory pathway

18.00 – 19.30 Welcome drinks reception in the Picture Gallery
19.30 – 21.00 Dinner (Athlone dining hall).

Friday 15 September

Session II: Golgi dynamics

(Chair: R. Duden)

09.00 – 10.40 **Alberto Luini (Mario-Negri Sud, IT)**
Organization of secretory traffic: two different ways to cross the Golgi

09.00 – 10.40 (cont) **Speaker selected from abstracts**
Chris Hawes (Oxford, UK)
Golgi dynamics in plant cells

10.40 – 11.15 Tea/Coffee

Session III: Endosomal and lysosomal dynamics

(Chair G. Griffiths)

11.15 – 13.00 **Pete Cullen (Bristol, UK)**
Sorting nexins in endosomal trafficking
Speaker selected from abstracts
Ari Helenius (Zurich, CH)
Virus entry: pathways and mechanisms

13.00 – 15.00 Lunch (Founders dining hall), followed by tea/coffee, posters and trade exhibit in and around the Picture Gallery.

15.00 – 16.40 **Judith Klumperman (Utrecht, NL)**
Possible pathways to the lysosome
Speaker selected from abstracts
Gillian Griffiths (Oxford, UK)
Imaging the secretory synapse

17.00 – 18.00 **Plenary Lecture**
Graham Warren (Yale, USA)
Biogenesis of the Golgi apparatus

18.30 – 20.00 Dinner (Athlone dining hall)

Saturday 16 September

Session IV: Cytoskeleton–membrane interactions

(Chair: D. Stephens)

09.00 – 10.40 **Vladimir Gelfand (Illinois, USA)**
Regulation and coordination of molecular motors
Speaker selected from abstracts
Viki Allan (Manchester, UK)
title tbc

10.40 – 11.15 Tea/Coffee

11.15 – 13.00 **Folma Buss (Cambridge, UK)**
The role of Myosin VI in protein sorting and post Golgi membrane trafficking
Speaker selected from abstracts
John Hammer III (Bethesda, USA)
Visualizing Myosin V-Dependent Membrane Traffic

13.00 – 15.00 Lunch (Founders dining hall), followed by coffee, posters and trade exhibit in and around the Picture Gallery.

Session V: Events at the plasma membrane

(Chair: B. Nichols)

15.00 – 16.40 **Tom Kirchhausen (Boston, USA)**
Live cell imaging of clathrin-based endocytosis
Speaker selected from abstracts
Ben Nichols (Cambridge, UK)
title tbc

16.40 – 17.15 Tea/Coffee

17.15 – 19.00 **Christien Merrifield (Cambridge, UK)**
title tbc
Speaker selected from abstracts
Irina Majoul (Royal Holloway, UK)
Common laws for multi-subunit cargo for retrograde & anterograde transport

19.30 – Conference Banquet (Founders Dining Hall)

Sunday 17 September

Session VI: Organization and function of the ER

(Chair: T. Levine)

09.30 – 11.10 **Christoph Thiele (Dresden, DE)**
Lipid traffic from the ER into the droplets
Speaker selected from abstracts
Tim Levine (London, UK)
Positioning of the ER regulates cell cycle progression in yeast

11.10 – 11.45 Tea/Coffee

Session VII: Novel trafficking pathways and machinery

(Chair: M. Way)

11.45 – 13.30 **Michael Way (London, UK)**
Imaging virus trafficking
Speaker selected from abstracts
Rainer Pepperkok (Heidelberg, DE)
Illuminating the secretory pathway

13.35 – Lunch (Founders dining hall)
Depart

Other forthcoming meetings

2006

Bioscience 2006
Biochemical Society Annual meeting and Biochemical Journal Centenary meeting
23rd-27th July
Glasgow
www.bioscience2006.org

Interactome Networks
30 August – 3 September
www.wellcome.ac.uk

Genome Perspectives on Host–Pathogen Interactions
6–10 September
www.wellcome.ac.uk

Acetaldehyde-related Pathology
8 September, Kings College London
www.novartisfound.org.uk

Actin 2006
11th September
The Watershed, Bristol
Organisers: Harry Mellor and Giles Cory
www.bristol.ac.uk/biochemistry/actin2006/home.html

BSCB/The Royal Microscopical Society Autumn Meeting: Imaging and Trafficking
14–17 September, Royal Holloway College, London
Organisers: David Stephens and Rainer Duden
www.bscb.org

Genome Informatics
27 September – 1 October
www.wellcome.ac.uk

Macromolecular complexes in microbial pathogenesis, membrane trafficking and cell signalling
23–28 September
San Feliu de Guixols, Spain
H. Stenmark et al.

Protein transport systems: Protein targetting and translocation
30 September – 5 October
J. Soll
PL-Gdansk

The pathology of pre mRNA splicing: Diagnostic and mechanistic aspects
16–19 October
F.E. Baralle and E. Lippolis
IT-Trieste

Stem cells in tissue engineering: Isolation, culture, characterization and applications
28 October – 2 November
R.L. Reis and Jackie McLelland
Sant Feliu de Guixols, Spain

Mitochondria at the Heart of Life and Death
2nd December, London
www.novartisfound.org.uk

2007

30th Annual Meeting of the German Society for Cell Biology (DGZ)
14th – 17th March, Frankfurt am Main, Germany
http://www.zellbiologie.de

BSCB/BSDB/Genetic Society Joint Spring Meeting
29th March – 1st April, Heriot Watt University
Organisers: Sylvie Urbe and Angus Lamond
(see p xx)
www.bscb.org

16th International Congress of Cytology
May 13 – 17th Vancouver, BC, Canada
www.venuewest.com

Bioscience 2007
Annual meeting of the Biochemical Socirty "Life Sciences 2007" incorporating BioScience2007,
the British Pharmacological Society, &
the Physiological Society
8th-12th July, Glasgow
www.bioscience2007.org

BSCB Autumn Meeting Abercrombie
9th – 12th September, St Catherine's College, Oxford
Organisers: Anne Ridley, Michelle Peckham and Peter Clark
www.bscb.org

Techniques in Molecular Biology

University of Hertfordshire

College Lane, Hatfield,
Herts AL10 9AB UK.
www.herts.ac.uk/stc

Proteins and Proteomics
A two-day laboratory course
4–5 September 2006
Contact: Dr Ralph Rapley,
School of Life Sciences.
Tel: (01707) 284554; fax: 286137;
e-mail: R.Rapley@herts.ac.uk

Nucleic Acids and Genomics
A three-day laboratory course
7–9 September 2006
Contact: Mrs Vera Jones
Science Training Centre.
Tel:(01707) 284590; fax:286137;
e-mail: v.g.jones@herts.ac.uk

Application to join the BSCB

Please complete and return along with a signed Direct Debit mandate to:
Margaret Clements, c/o The Company of Biologists Ltd., 140 Cowley Road, Cambridge CB4 0DL, UK

Name: ..... Mr/Ms/Mrs/Dr/Prof

Position: ..... Male/Female

Academic qualifications: .....

Email: .....

Telephone: .....

Fax: .....

Address: .....

.....

..... Postcode: .....

Research interests: .....

.....

Membership of other societies:

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BSCB Member	Proposer	Seconder
Name:	.....	.....
Membership Number:	.....	.....
Signature:	.....	.....

Applicants without proposers should enclose a brief CV

The society has a searchable database of its members on the BSCB web page. This list is not sold or distributed in any other way. Your details will be included only if you tick this box ☐

Applicant's signature: ..... Date: .....

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Honor Fell Travel Awards

Jointly funded by the BSCB and the Company of Biologists

Honor Fell Travel awards are made to provide financial support for BSCB members, usually 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 £250 for UK meetings (except for BSCB Spring or Autumn Meetings for which the registration and accommodation costs will be made, even in excess of £250), up to £300 for European meetings and up to £400 for meetings in the rest of the world. Awards are made throughout the year.

The following rules apply:

- Awards are not normally made to applicants over 35 years of age.
- Applicants must have been a BSCB member for at least a year or be in the first year of their PhD.
- No applicant will receive more than one award per year or three in toto.
- The applicant must contribute a poster or a talk on/at which they should acknowledge BSCB support.

No single lab will receive more than £1000 per year.

Applications should be sent to:
Jordan Raff, The Wellcome Trust/CR UK Gurdon Institute, Tennis Court Road, Cambridge CB2 1QN

All applications must contain the following:

- **the completed and signed application form (below)**
- **a copy of the abstract being presented**
- **proof of registration and travel costs**
- **a copy of the completed meeting registration form.**

First-year PhD students should send a copy of their BSCB membership application.

Application for an Honor Fell travel award

Full name and Mailing address:

.....

.....

.....

.....

.....

Email address: .....

Age: .....

BSCB Membership number: .....

❑ I have been a BSCB member for more than one year

The years of previous Honor Fell Travel Awards:

.....

Degrees with dates: .....

.....

Present Position: .....

Number of Meetings attended last year:

.....

Meeting for which application is made (title, place and date):

.....

.....

.....

Expenses:

Travel: .....

Registration: .....

❑ I have included proof of registration and travel costs

Have you submitted any other applications for financial support?

YES/NO (delete as applicable)

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

.....

.....

Supporting statement by Head of Laboratory:

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 laboratory has not received more than £1000 in Honor Fell Travel Awards this calendar year.

Signature: .....

Name: .....

Applicant's

Signature: .....

Name: .....

BSCB President's report, 21 April 2006

It has been another good year for the BSCB. The Autumn 2005 meeting, organised by Michael Way, had an exciting programme, with a superb collection of talks on the theme of cytoskeletal manipulation by micro-organisms. The Spring 2006 meeting, held jointly with the BSDB in York, was also a great success: Tariq Enver and Roger Patient put together a great programme on stem cells, and we were overwhelmed by the number of participants. The lunch time session on 'how to get your paper published' was also a highlight, and I am very grateful to the speakers who took time out from their editorial duties to explain the perilous route from submission to appearing in print. I would like to thank everyone involved in our meetings, including the programme organisers, speakers, poster presenters and delegates, and our super-efficient meetings secretary, Kairbaan Hodivala-Dilke, for ensuring their success.

While running meetings is the most visible aspect of the BSCB, there is much more to the Society. Other activities include distributing Honor Fell travel awards, which Jordan Raff does so well, dispersing small amounts of money to support workshops around the country, and running a schools outreach programme, the latter being organised with tremendous commitment by David Archer. All of these activities are flourishing, and the BSCB is in secure shape financially thanks to the efforts of our treasurer, Mark Marsh. We are grateful to all the organisations who generously sponsor our activities, in particular the Company of Biologists, who under-write our meetings and travel awards.
I would like to thank the members of the BSCB committee, and our assistant, Margaret Clements, for all their hard work. This year has seen a number of retirements. Michael Whitaker, a veteran of the committee, has stepped down as Secretary and is replaced by Liz Smythe. Joan Marsh, who has done a superb job as Newsletter editor, has handed over to David Stephens; and I have passed on the role of President to Clare Isacke. Gillian Griffiths and Angus Lamond have retired from the committee and we are delighted to welcome Iain Hagan and Adrian Harwood as new committee members. We would welcome suggestions for additional committee members.

In closing, I would like to thank everyone involved with the BSCB, at all levels, for making it such a great Society, and above all, such fun.

Fiona M. Watt,
London,
April 2006

BSCB New members from April 2005

Abi-Elmagd, Muhammad
Adams, Joanna
Aganna-Omoyinmi, Ebun
Ageichik, Alexander
Al-Qenaei, Abdullah M.B.K.
An, Rong
Baker, Chris
Bateman, Belinda
Bettencourt-Dias, Dr. Monica
Birmingham, Simon
Bochenek, Magdalena
Bond, Dr. Jacquelyn
Booden, Helen
Boros, Katalin
Borumand, Maryam
Boxall, Sally
Boyle, Kieran A.
Brackley, Karen
Braun, Toby
Brooks, Elizabeth
Bruce, Dr. Alexandra
Bujny, Miriam
Burton, Adam
Buus, Richard
Cambrey, Dr. Alison
Carrol, Michael
Cheng, Dr. Aixin
Choi, Inchul
Ciani, Lorenza
Clague, Prof. Michael
Colman, Lucy
Croasdale, Rebecca
Dalton-Griffin, Lucy
Das, Partha Pratim
de Wynter, Erika A.
Dickins, Ellen
Dingley-Nicolson, Tamara
Dobbyn, Dr. Helen
Donaldson, Dr. Anne
Duden, Dr. Rainer
Duffy, Philip
Duperchy, Dr. Esther
Easton, Jennifer
Elahi, Magsood, M.
Elliot, Dr. Kerry J.
Erasmus, Jenni
Escaron, Claire
Fatimathas, Luxmi
Forbes, Dr. Karen
Frasa, Marielle
Gatt, Dr. Melanie K.
Gehmlich, Katja
Gerasimenko, Dr. Julia
Gillingwater, Edmund
Gruenewald, Jana
Guiral, Emily
Gunn-Moore, Dr. Frank
Haines, Steve
Hall, Dr. Anita C.
Hansen, Dr. Jonathan
Haque, Farhana
Harris, Dr. Linda
Hettema, Ewald H.
Hill, Dr. Kirsti
Hirst, Caroline
Ho, Daniela Gattegno
Horeira, Severina
Howe, Jonathan
Hung, Yvonne
Ito, Dr. Yoshifumi
Jackson, Dr. Stephen P.
Jackson, Leigh
Jopling, Helen
Jouvenet, Dr. Nolwenn
Kadir, Shereen
Kalaji, Ruba
Kasher, Paul
Kingham, EmmaJayne
Kirk, Adam
Knight, Jennifer
Lee, Shih-Han
Lennie, Gregor
Lesa, Dr Giovanni M.
Liebig, Timo C.
Lindhal Allen, Marianne L.
Lomax-Brown, Hannah J.
Ma, Hansong
Ma, Miss Pikyee
Maguire, Richard
Martins, Ana Paula
McClelland, Dr. Sarah
McRae, Lisa
Michailidou, Mary
Minchin, James
Mirmalek-Sani, Sayed-Hadi
Mitchell, Andrew
Nani, Alice
Nilsson, Jakob
O'Brien, Etienne
O'Neill, Kathy
O'Shea, Marie
Parkinson, Donna
Patel, Ashvin
Pearson, Caroline
Perrett, Rebecca
Portillo, Monserrath F.
Prorocic, Marko
Prosser, Suzanna
Rachidi, Najma
Radulovic, Marko
Razavi, Janet
Richardson, Emily
Risley, Michael D.
Rizzo, Dr. Sian
Robertson, Alastair
Robertson, Dr. Alasdair M.
Robins, Sarah
Rosenberg, Laura
Saad, Nicole
Scott, Anna
Sczaniecka, Matylda
Sharpe, Helen
Shaw, Dr. Tanya
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Smallwood, Dawn
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West, Dr. Michele A.
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Whiteford, James
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Winterbottom, Emily F.
Wolfgang, Werner
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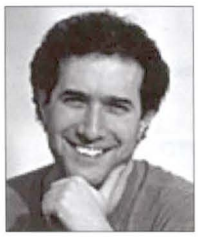

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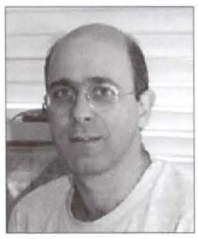

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The BSCB newsletter is published twice a year in June and December.

Submission:
If you have an idea for an article please e-mail the editor a brief outline first. Appropriate colour images are welcomed for consideration for the front cover.

It is preferable to send all articles, reports and images by e-mail (though alternatives can be arranged after contacting the editor).

Attachments for text can be in txt, rift or doc format. Please send images as 300dpi JPEG, TIFF or PSD files.
If images are for the front cover, please send as CMYK.

Submission of articles and images should be made to
Dr David Stephens
Department of Biochemistry, University of Bristol,
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Meetings:
Please note there is no charge to advertise a scientific or educational meeting. Please contact the editor with details of any meeting you wish to advertise.

Deadlines:
For the final version of articles and other materials and adverts is 1 April for publication in June and 1 October for publication in December.

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New members should complete an application form to join the BSCB (form on p28) and include it with their subscription dues. Send direct debit forms, bankers drafts and any membership application forms to Margaret Clements, Department of Zoology, Downing Street, Cambridge, CB2 3EJ.

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Margaret Clements, BSCB assistant, c/o The Company of Biologists Ltd., 140 Cowley Road, Cambridge CB4 0DL
Email: bscb@biologists.com
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