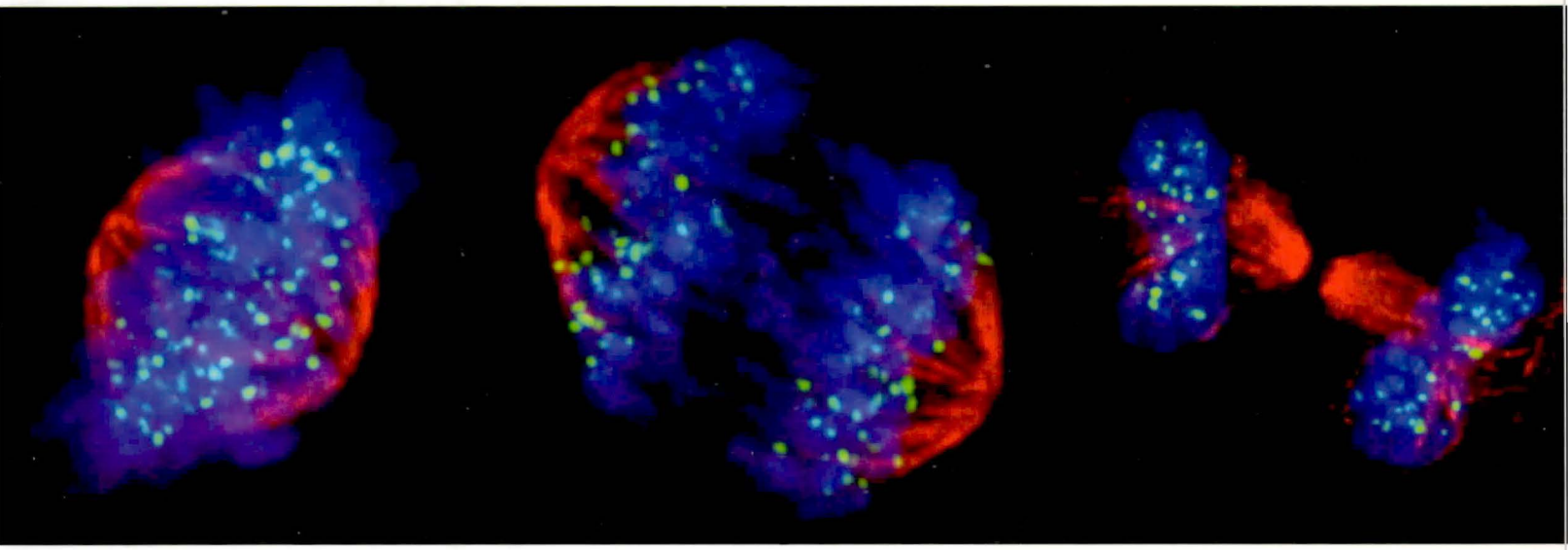


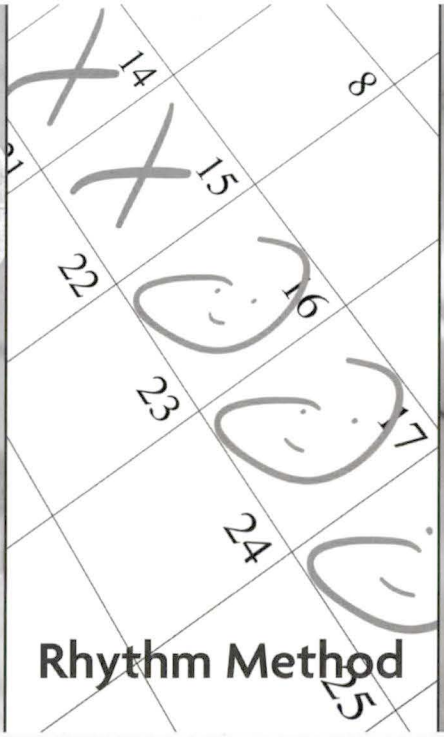
BSCB Newsletter

Summer 2003

British Society for Cell Biology

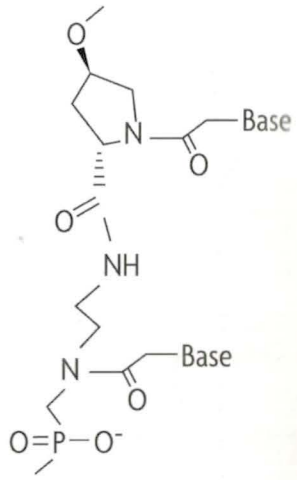
the evolution of gene silencing

Cold Shower



Rhythm Method

The Pill



gripNAs™

gripNAs silence only one gene at a time.

Active Motif's custom gripNAs™* synthesis service provides researchers with the latest, most advanced materials available for gene silencing. gripNAs combine high-affinity binding with unsurpassed sequence specificity to selectively silence only the targeted gene. gripNAs have proven effective in mammalian cells (Figure 1), Zebrafish, *Xenopus* and *in vitro*.

gripNAs are a novel, negatively charged form of Peptide Nucleic Acids that exhibit greater sequence specificity than conventional gene silencing reagents. Their binding affinity is significantly reduced if there is even a single base-pair mismatch with their target. This improves your results by minimizing the non-specific interactions that commonly occur in other gene silencing methods.

gripNA advantages:

- Gene silencing in mammalian cells, Zebrafish and *Xenopus*
- High sequence specificity reduces mistargeting phenotypes
- Resistance to nuclease degradation prolongs their effect

All of the information you need to design, order and use gripNA probes can be accessed at www.activemotif.com/gripna. To get the most highly evolved materials for specific gene silencing, order custom gripNAs.

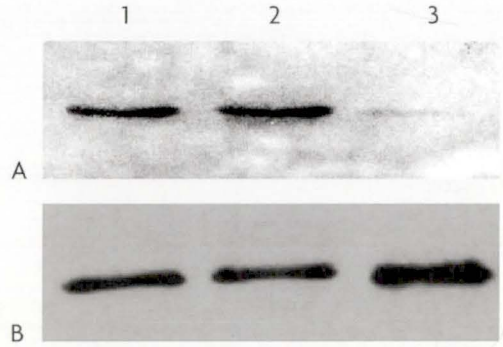


Figure 1: **gripNA silencing of cyclin B1.** An 18-mer gripNA probe (1 µM) targeted against cyclin B1 was complexed with Chariot II™. gripNA probe alone and the Chariot II/gripNA probe complex were overlaid onto cultured HS-68 cells synchronized by serum starvation for 40 hr, then released by addition of serum for 4 hr. Expression of Cyclin B1 protein was analyzed by Western blot after 20 hr (A). Cdk2 protein was also analyzed by Western blot to normalize the amount of protein loaded in each lane (B). Data provided by Dr. L. Chaloin, Dr. M. Morris and Dr. G. Divita, CNRS, Montpellier, France.

Lane 1: Negative control
Lane 2: Addition of gripNA probe only
Lane 3: Addition of Chariot/gripNA probe complex.

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ACTIVE MOTIF

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Cell & Molecular Biology

BSCB Newsletter
Summer 2003

Editorial

The Joint Spring Meeting in Warwick was another success. There are full reports from all the sessions in this newsletter. Not reported is the caelidh but some things are beyond words. We offered bursaries to undergraduates for the first time and the three people chosen thoroughly enjoyed themselves and benefitted enormously. The initiative is to be continued. Next year will prove a challenge, as the BSCB will be organizing a Spring meeting on its own, since our usual partners, the BSDB, have decided to join with the Genetics Society for 2004. The BSCB meeting will be in Canterbury and you are all urged to put the dates into your calendars now.

Plans for the Autumn meeting are complete; this will be jointly hosted with the British Association for Cancer Research. The programme is included in this Newsletter and anyone interested in the cell biological aspects of cancer should consider attending.

The features include a description of life at the Laboratory for Molecular Cell Biology in London and an update on the International Federation for Cell Biology. There is also an account of modern technologies used in journal publishing – an interesting view of what happens to your papers after submission.

Finally, there is a bumper collection of book reviews. As usual, my thanks to all the contributors and a plea to anyone interested in writing for the next issue to contact me.

The Editor

Newsletter editor: Joan Marsh
Design/layout: Giles Newton
Printer: Cambridge University Press
Website: www.bscb.org

Cover image: Mitotic HeLa cells. Chromosomes stained with DAPI (blue), spindle fibers with anti-α-tubulin (red) and centromeres with CREST (green), a human autoimmune sera (gift from Professor William Earnshaw, Edinburgh University). Images are maximum-intensity projections of deconvolved 3D data sets acquired on a DeltaVision Restoration microscope (Applied Precision LLC). Courtesy of Dr Laura Trinkle-Mulcahy, University of Dundee.

News

Features

Book Reviews

Meeting Reports

Forthcoming Meetings

Forms

Society Business

News

MRC in the firing line

Members may be aware of the recent House of Commons Select Committee on Science and Technology report on the work of the MRC. The report, published 12 March 2003, makes interesting reading (http://www.publications.parliament.uk/pa/cm200203/cmselect/cmsctech/132/13202.htm). While praising MRC's glorious past and current contribution, it is highly critical of three aspects of the MRC's work:

- Lack of clear communication with scientists and the public
- Poor planning of the budget
- The Cooperative Group grants scheme.

The process leading to the report involved a call for input from the public, followed by written questions and answers to/from the MRC by the Committee and a public hearing attended by Prof Sir George Radda, the Chief Executive Officer of the MRC.

The UKLSC (to which BSCB is affiliated) made a strong representation, which is an Appendix to the report, as did other individuals and groups.

The initial response of the MRC was essentially to reject the Committee's conclusions (http://www.mrc.ac.uk/index/public-interest/public-press_office/public-press_releases_2003/public-25_march_2003.htm).

We shall wait to see what happens next.

Changes on the BSCB committee

There have been several changes to the Committee. Full details for each member may be found on page 38. Kairbaan Hodivala-Dilke now takes over as Meetings Secretary from Charles Streuli. Charles has done a magnificent job over recent years, including creating documentation on how to organise a BSCB meeting. Kairbaan will have the additional challenge of running the Society's first solo Spring meeting, since next year the BSDB have decided to go with the Genetics Society, so we'll be on our own. No pressure, Kairbaan!

Steve Winder has resigned as Membership Secretary and this post has been taken on by John Pines. Simon Hughes has also finished his term on the Committee, so we're looking for someone else to run the website.

New recruits always welcome

Please note that any BSCB members can nominate themselves or fellow cell biologists for election to the committee. Each person should have a nominator and a seconder. We are looking for committee members who represent a good spread of interests and geographical location and who, above all, will make a POSITIVE contribution to the running of the BSCB.

Nominations should be sent to the BSCB Secretary, Michael Whitaker, and are welcome throughout the year. Committee meetings are held at the Spring meeting, then once or twice more during the year.

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 (zoo-jeb01@lists.cam.ac.uk).

BSCB Ambassadors

The Society has instigated a new scheme of appointing 'ambassadors' to promote Society activities and membership within their university or institute. Over 80% of the Society's membership works within 34 institutions and so far 22 of these are represented on the scheme. BSCB Ambassadors disseminate email advertisements concerning future BSCB meetings, promote the advantages of BSCB membership, particularly to the new PhD student intake, and are available to sign application forms and answer any other BSCB-related queries.

City/Institution	*Representative*	*email*
Aberdeen	Denys Wheatley	wheatley@abdn.ac.uk
Bath	Geoff Holman	g.d.holman@bath.ac.uk
Birmingham	Rob Insall	R.H.Insall@bham.ac.uk
Bristol	Harry Mellor	H.Mellor@bristol.ac.uk
Cambridge	Jon Pines/Paul Luzio	jp103@cam.ac.uk
Dundee	Angus Lamond	a.i.lamond@dundee.ac.uk
Durham	Roy Quinlan	r.a.quinlan@durham.ac.uk
Edinburgh	Bill Earnshaw	Bill.Earnshaw@ed.ac.uk
Glasgow	Steve Winder	s.winder@bio.gla.ac.uk
Guildford	Tom Wileman (Pirbright and all BBSRC)	thomas.wileman@bbsrc.ac.uk
Imperial	Vania Braga	v.braga@ic.ac.uk
Cancer Research UK (LIF)	Fiona Watt	f.watt@cancer.org.uk
Kings/Guys	Simon Hughes	s.hughes@kcl.ac.uk
Leeds	Michelle Peckham	m.peckham@leeds.ac.uk
Manchester	Charles Streuli	charles.streuli@man.ac.uk
NHLI etc	Clare Isacke	c.isacke@icr.ac.uk
Norwich	Peter Shaw/Grant Wheeler	grant.wheeler@uea.ac.uk
Newcastle	Michael Whitaker	michael.whitaker@newcastle.ac.uk
Queen Mary	Mark Turner	m.d.turner@qmul.ac.uk
Sheffield	Liz Smythe	e.smythe@sheffield.ac.uk
UCL	Mark Marsh	m.marsh@ucl.ac.uk
York	John Sparrow	jcs1@york.ac.uk

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. Requests for funds should be sent to the Treasurer, Mark Marsh (see p 38), accompanied by a report of a previous meeting. If a meeting receives such support, a report of the meeting will be required for publication in the Newsletter.

Paying double?

There are still some members paying by both Direct Debit and Standing Order. Check you have cancelled the latter!

Honor Fell Travel Awards

Young BSCB members attending scientific conferences relevant to cell biology are eligible to apply for financial support in the form of an Honor Fell travel award. Full details are on the application form at the end of the Newsletter.

Central and Eastern European Travel Awards

A limited number of awards is available for people from Central and Eastern Europe to attend BSCB meetings. Applications from other parts of the world may also be considered, in exceptional circumstances. Potential applicants should contact the Honor Fell Awards secretary (see p 38).

Poster prize

This year's poster prize at the Spring Meeting was awarded to Karen Groot from Cancer Research UK for her poster on 'Membrane targeting of the cytoskeletal linker proteins envoplakin and periplakin'. Karen won a fully funded trip to the ASCB conference in December. The runner-up was Antonis Kirmiziz from the University of Wisconsin-Madison, who received a year's subscription to *Nature Cell Biology* for a poster on 'SU(Z)12: Characterizing its expression and identifying its downstream target genes in cancer cells'.

Cheaper journal subs for members

Did you know that BSCB members are entitled to discount subscriptions for several journals? The money saved more than compensates for your membership fee, so encourage your friends to join the Society. Details are on p 40.

New authoring and editorial technologies

The worldwide acceptance and use of the internet and email among academics and researchers has encouraged the acquisition of new technologies to speed and ease the submission of papers to peer-review journals. The introduction of this technology has now begun to close the digital loop of communication and collaboration among scientists, and to fulfill, on an industriial scale, some of the original promise of the early Internet.

Online submission started about 4 years ago when new technology companies started to design web applications specifically for the purpose. Since then, application development has moved rapidly. Several products dominate the market with each of the major publishers wedded to one of them. There are also newer companies offering purportedly a quick and easy option for smaller journals and societies that self-publish. Some companies offer a fully bespoke system, individually tailored to a particular journal's editorial workflow; others have a stock set of workflows to into which a journal is expected to shoehorn its editorial process. There are benefits and drawbacks to each, the cost of bespoke systems not being the least of them. Some major publishers also now have Author Portals through which authors may submit to any one of the journals in a publisher's portfolio.

The web applications comprise a front end of a series of web pages, highly scripted in a language such as Java, linked to a very powerful database that records, holds and supplies information to the pages in real time; different from regular websites that are essentially a collection of linked html pages. The system I use works on most computers with an internet connection and Internet Explorer or Netscape above version 4.x. It allows users to log in via a username and password and to have a number of roles according to the permissions given by the administration. Authors may submit new and revised manuscripts by following a simple, 12-step process in which they enter data such as institutions, authors' names, the abstract, title, etc.

The final stage is to upload a version of the paper, usually as a Word document, for conversion to a pdf file. Images maybe uploaded and are converted to low-resolution jpegs for ease of viewing by editors and referees. Supplementary material such as tables or referenced papers can also be submitted. The submission is acknowledged with an ID number on a page that may be printed out and also by email within 24 hours.

Referees and Associate Editors also log on via the same system and have access to papers to which they have been assigned. Referees view the pdf and the figures of a paper and fill out a review form in the web application with their comments. Associate Editors can check papers before assigning them for review and have access to the database of referees that has been built up over the years; searching for the keywords of the paper on the referees database helps to find appropriate reviewers. After reading the reviews posted by the referees, Associate Editors in our particular workflow recommend a decision to the Editor-in-Chief. The Editor-in-Chief can look at any paper that has been submitted and make decisions about each paper, taking in the comments from referees and Associate Editors. The Editor-in-Chief and the Administrator of the journal also have access to many reports providing up-to-the-minute statistics on submission rates, geographical breakdown, reject/accept percentages, and so on.

An email address is a necessity for the system as all communication between authors, referees and editors is via email. This use of email is the key to the system's speed. Checking by an administrator, allocation to an Associate Editor, invitations to referees, their acceptance to review and their ability to see the manuscript can be accomplished within a matter of minutes. Compare this to submitting a manuscript on a Monday morning and having to wait for the post to be picked up at 4pm, knowing that it may or may not reach the administrative office by the next day and perhaps reviewers by the start of the next week.

Referees in general have supported our move to an online system. Many have found it easy and quick to use and with the immediacy of email ask for assistance or complete their reviews more quickly than before. A few have grumbled about 'having' to print papers out and the extra expense involved but this is more than offset by the reduced costs and increased spped when being an author for the same journal; this two-way relationship is how peer-

review journals continue to be peer-reviewed. Our Associate Editors and Editor-in-Chief are very happy not having to have piles and piles of papers to find space for in their office. They have adjusted very quickly to the new system, checking it every morning as routinely as checking their email.

There are drawbacks to the system as well. As yet, no system has a proper conduit into the Production department of the publisher. Authors are often still asked to send hard copies of papers, figures and copyright agreements once their papers have been accepted; although all publishers and software companies are working hard on this bridge to make a completely digital workflow from submission to final print.

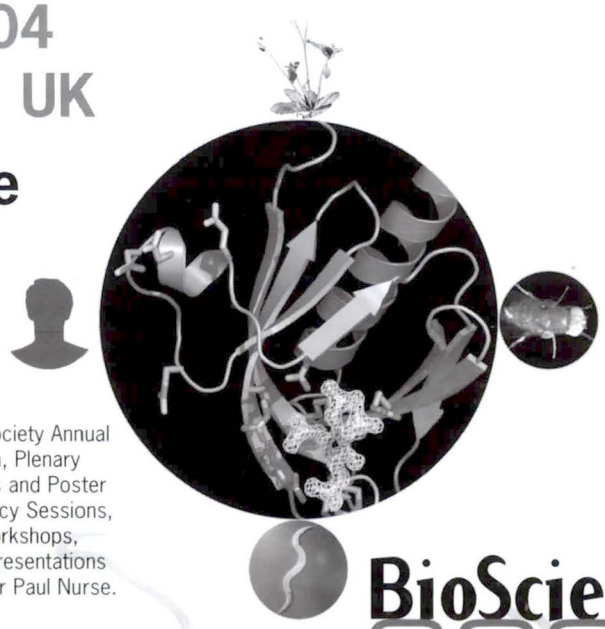
So what of the future for this technology? Author portals will become more and more common, References in submitted manuscripts will eventually be hyperlinked through Medline for easier checking. The submission of figures and Word documents will be concatenated into a single pdf file for referees making reviewing even easier. Newer versions are working on Word templates for authors to download and type into so data is captured in XML format when the file is uploaded: no need to fill in fields on web pages anymore. As technologies converge into a single non-proprietary code for submitted manuscripts, the possibility of a single submission being passed between journals may become possible.

Jeremy Theobald
Managing Editor
The Journal of Pathology
jtheobal@wiley.co.uk

www.BioScience2004.org

18–22 July 2004
SECC Glasgow, UK

THE life science meeting of 2004!



BioScience2004 is the first Biochemical Society Annual Meeting and will comprise not only Symposia, Plenary Lectures, Medal Lectures, Oral Presentations and Poster Sessions, but also Industrial Workshops, Policy Sessions, Science and Society Sessions, Education Workshops, Research Colloquia, Independent Scientific Presentations and an opening lecture by Nobel Prize Winner Paul Nurse.

Focus topics for the meeting:

- **Lipids, Rafts and Traffic**
- **Structure Related to Function: Molecules and Cells**
- **Signalling Outwards and Inwards**
- **Genes: Regulation, Processing and Interference**
- **Energy: Generation and Information**
- **Ethics, Education and Employment**

Plenary Speakers:

- **Stephen O'Rahilly (Cambridge, UK)**
- **Tony Pawson (Toronto, Canada)**
- **Chris Dobson (Cambridge, UK)**
- **Karen Vousden (Beatson Institute, Glasgow, UK)**
- **Graham Warren (Yale, New Haven, CT, USA)**

Poster presentation is a core element of the BioScience2004 meeting programme and scientists are encouraged to submit a poster abstract. Not only is it a perfect forum in which to present and discuss your work, but you may also be eligible for one of the following awards...

Promega UK Young Biochemist 2004

The *Promega* UK Young Biochemist of the Year competition will take place at BioScience2004. To enter, eligible candidates must be UK PhD students or researchers under the age of 29 and still in the first two years of their post doc. The winner will receive a prize of £600 and a unique trophy.

New England Biolabs Poster Prize

The *New England Biolabs* Poster Prize will be awarded to the best three posters by authors working within a UK-based organization. The winner will receive £350, and the 2nd and 3rd runner-up will receive £150 and £50 respectively.

Pfizer Research Colloquium

Young researchers are encouraged to submit a poster abstract to the Colloquium if they are within 5 years of research, following on from their first degree. They will be invited, at the time of submitting their poster abstract, to elect to be considered for presentation as an oral communication at this Colloquium. *Pfizer* will award a cash prize for the best oral communication. All of the selected speakers will have their travel and accommodation costs covered by *Pfizer*.

Poster abstract submission will shortly be available online at www.BioScience2004.org

BioScience 2004

from molecules to organisms

The science in this meeting aims to fulfil the definition of what the 'Biochemical Society' does to produce a molecular explanation and understanding of biological phenomena.

Chair of Scientific Programme Committee: Professor Robin Irvine (Cambridge, UK)

POSTER ABSTRACT SUBMISSION DEADLINE: FRIDAY 23 APRIL 2004

EARLY REGISTRATION DEADLINE: TUESDAY 18 MAY 2004

Registration Fees

- Biochemical Society full members – £190
- Student members of Biochemical Society and sister societies – £65
- UKLSC members – £250
- Non-members – £350

Please note: the registration fees will increase after 18 May 2004.

For further information or to be placed on the mailing list, visit: www.BioScience2004.org or e-mail info@BioScience2004.org

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www.BioScience2004.org

THE BIOCHEMICAL SOCIETY Founded 1911

Logo images courtesy of Daan van Aalten, Julie Ahringer, Malcolm Bennett and Cathy Torgler. Meeting supported by the Greater Glasgow & Clyde Valley Tourist Board

Supported by the *Biochemical Journal* – promoting international scientific communication

International Federation for Cell Biology

For some time, the IFCB has been gently operating behind the scenes, approaching many different aspects of cell biology that call for better integration amongst ourselves (the member or national societies) and other organizations, notably the International Union of Biological Societies.

After its last General Assembly, Merton Bernfield took over the reins of IFCB as Secretary General from Ivan Cameron, who was elected President. Fate was to land a cruel blow – Merton developed Parkinson's disease that progressed very fast and he died on 18 March 2002. Through the generosity of many people and organisations, ASCB developed a fund in his memory and the Merton Bernfield award is now available each year to help young cell biologists attend ACSB meetings.

I officially took over from Merton in May 2002 and have been actively seeking to involve new societies in our organization, extend the Federation's activities and generally raise the profile of cell biology throughout the world. It has been a most rewarding experience and excellent progress is being made on many fronts.

Regarding Asia, the Korean Society is now a full member of IFCB, as is Taiwan. We hope to see countries such as Malaysia, Singapore, Iran and others coming on board. The Special Autonomous Regions of China (for example, Hong Kong) are also approaching the IFCB with regard to membership, and the newly formed Russian Society for Cell Biology will probably become a full member in 2004.

Europe's new face within the Federation is that of ELSO (www.elso.org), to which the BSCB became affiliated when ECBO became defunct in September 2000. It has already held two successful meetings in Geneva (2000) and Nice (2002). ELSO's next annual meeting will be held in Dresden, Germany, 3–8 July 2003. ELSO will be the host society for the next (the 8th) International Congress of Cell Biology in Nice (France), 4–8 September 2004.

The IFCB website (www.ifcbiol.org) gives information about its programmes, geared largely to helping young cell biologists. The IFCB's official journal, *Cell Biology International*, has had a chequered career, but latterly it has returned to better shape. The future looks bright and we continue to solicit papers of high quality. We are also encouraging institutions to take the journal or at least to ensure that it is included in the basket of journals accessed freely and immediately online through their subscription to Elsevier Science (ScienceDirect).

Denys Wheatley (member)
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The MRC Laboratory for Molecular Cell Biology

Inconspicuously attached to the old Medawar Building on the Gower Street campus of University College London sits the Medical Research Council Laboratory for Molecular Cell Biology (LMCB). Nearing its 10th anniversary, the LMCB houses 18 research groups and is growing. Under the active directorship of Alan Hall, the LMCB saw the incorporation of the new MRC Cell Biology Unit in April of 2001. A host of new young groups gives the building a sense of energy and potential, making it a stimulating and rewarding place to do research.

The organisation of the LMCB is somewhat unique. The MRC funds a core number of eight independent research groups, while various other sources support the remaining laboratories. Despite the differences in research funding, there is no distinction or differentiation between these groups with regard to the use of the core facilities supplied by the MRC, which include laser scanning and multiphoton confocal microscopes, electron microscopy facilities, media preparation and IT support. Further embedding the LMCB within UCL is the link to other cell biologists within the university through the Institute for Molecular Cell Biology.

The open plan nature of laboratory space means that groups work in close proximity to each other, which engenders a flow of knowledge and expertise between groups and a community sense of shared advancement. These attributes make the LMCB "a great environment for young people to set up groups and do research," according to Director Alan Hall.

A recent success that exemplifies this easy exchange of knowledge is the publication of a study in *Nature* regarding the mechanism of mood-stabilising drugs by the Harwood and Mudge groups.

The regular internal and invited seminar series, as well as the inter-group lab meetings, make for an especially instructive environment. Christian Dillon, a post-doc, describes the seminar series as "providing a varied mix of topics that are both interesting and relevant". The variety of research topics and methods employed provide what Alan Hall sees as a scientific balance. "Although the topics researched are different, they are also connected to allow interaction", he says.

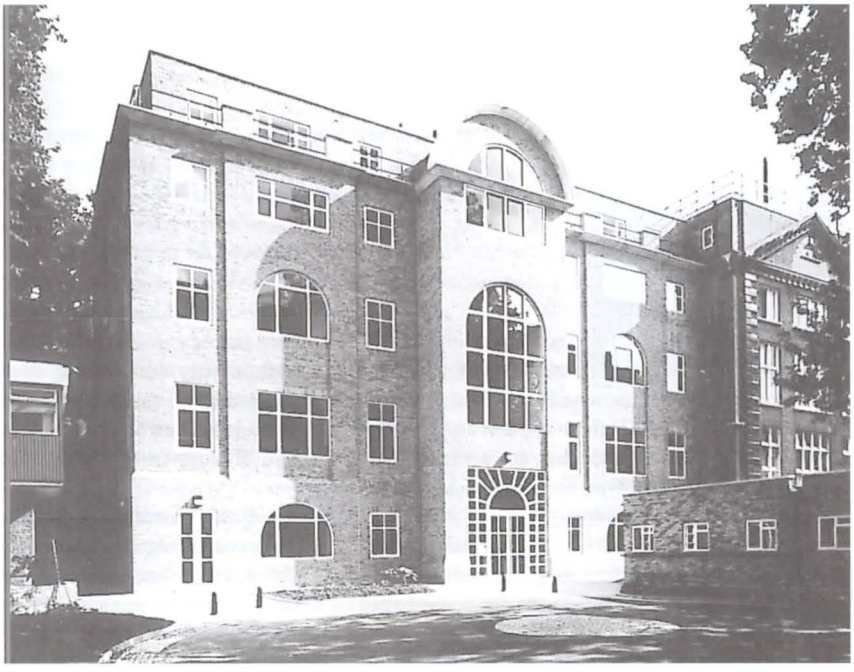
There are several groups employing model organisms, including *Dictyostelium*, *Caenorhabditis elegans* and *Drosophila melanogaster*. Stephen Nurrish studies the regulation of neurotransmitter release in *C. elegans*. He sees genetics as being "particularly good at telling you what molecules are important", especially those involved in intercellular signalling. Making use of the power of genetic screens in an organism with a well-defined nervous system, he has been able to identify and further characterise the role of DGK-1, a diacylglycerol kinase, in the regulation of acetylcholine release at the worm neuromuscular junction.

Yasuyuki Fujita is a recent addition to the LMCB. He came from the Max-Delbruck Center in Berlin. His group is interested in cell–cell adhesion regulation of adherens junctions, in particular the role of the novel E-cadherin ubiquitin ligase, Hakai. As a first time group leader, he feels that the "moderate lab sizes, loose hierarchy, open door policy and numerous opportunities to meet your neighbours" have made setting up his lab a less traumatic experience than he had expected. "As a young group leader, this is the best place," he says with a big smile on his face, giving the impression of a contented man.

Dan Cutler moved from Imperial College over 10 years ago to become one of the founding groups of the LMCB. "The chance to help form a whole new institute dedicated to molecular cell biology was irresistible." The Cutler group studies the trafficking of P-selectin in endothelial cells. This receptor is involved in the recruitment of leukocytes from the blood stream. "Storage in Wiebel-Palade bodies, triggered exocytosis, rapid internalisation and recycling or degradation make up the complex travel of this receptor. The proper regulation of all these processes is required to produce a balanced inflammatory response". The aim of the Cutler group is to "understand both the trafficking of P-selectin and the modulation of this itenary in health and disease".

Yukiko Goda moved here from the University of California San Diego in March 2002. Her group is

studying the regulation of synapse form and function in cultured hippocampal neurons. Having come from a dedicated neuroscience department to a cell biology institute, she sees many benefits from interactions with traditional cell biology labs, when trying to understand the cell biology of neurons. With easy access to the Departments of Physiology and Pharmacology next door, Yukiko regards the LMCB to be uniquely positioned to encourage high quality research in neuronal cell biology.



In tandem with the LMCB's aim to carry out world-class research, there is a strong educational ethos in the building, exemplified by the MRC-funded four year PhD training programme run by Anne Mudge, which was the first such programme in the UK. Students choose from among 40 laboratories in the LMCB and various departments in UCL. During their first year, students select three laboratories and spend three months in each, working on research projects. Emma Hiley, a first year student, sees this as an opportunity to "experience the real working environment of a lab" before choosing where to do a three year project.

A newly forged link with the UCSF cell biology graduate program gives students from both sides the opportunity to work on research projects in laboratories within the respective graduate programmes. The first year also involves an intensive tutorial schedule, covering various areas of molecular cell biology, developmental biology, neurobiology, immunology and the cell biology of disease. Uli Bialucha, another first year student, enjoys the opportunity to "get first hand information about a particular area from a successful scientist". This blend of options and learning gives the student a solid basis from which to choose a mentor and PhD project.

As part of the much-needed drive to introduce science to the wider public, the LMCB has begun collaborating with local schools to investigate an interface between science and young school children. Under the steady hand of Sarah Cant, a third year PhD student in the laboratory of Julie Pitcher, a group of 30 children from Camden High School spent a day at the LMCB. "In introducing pupils to the work done in the LMCB, we hope to improve the image of scientists, explain the impact of basic research on day to day life, and even broaden the horizons of these kids to consider research as a career" is how Sarah describes the initiative (featured in the BSCB Winter 2002 newsletter).

But all is not work within the walls of the LMCB. There is a monthly competition between labs to concoct the most ferocious and mind blowing cocktails, along with interesting nibbles at the end of month, Friday happy hour. Jody Rosenblatt, the chief-of-staff of these events, sees them as "a perfectly suitable way to unwind after a week at the bench".

The recent two-day retreat at Hinxton Hall, Cambridge was a chance for the LMCB to talk science and party, sometimes all at once. The line up of speakers included David Goldstein, (Dept. of Biology, UCL), Christine Holt, (Dept. of Anatomy, Cambridge) and Len Stephens (Babraham Inst., Cambridge). The group leaders, students and post-docs provided the evening's entertainment in attempting to outdo each other in the realm of theatre and farce.

The location of the LMCB in the heart of the venerable UCL campus makes for easy interaction with the rest of the UCL research fraternity, be it for seminars and journal clubs or research collaborations. The juxtaposition of a modern research unit with the historical and accomplished buildings of Jeremy Bentham's inspired University College gives a young researcher both an appreciation of what has gone before and the motivation to carry out quality research.

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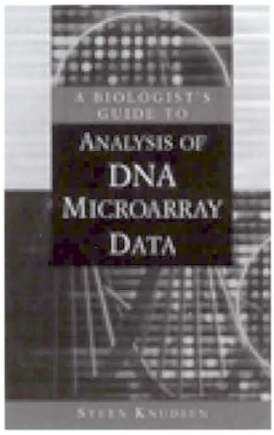
Book Reviews

A Biologist's Guide to Analysis of DNA Microarray Data

Steen Knudsen



A Biologist's Guide to Analysis of DNA Microarray Data
Steen Knudsen; Wiley-Liss, 2002
ISBN 0-471-22490-1; 144 pages

This useful little book provides a short introduction to the principles and possibilities of microarray hybridisation, then proceeds to devote the remaining 90% of its length to explain some principles of data analysis. Approaches are arranged roughly in order of recommended application, with the simplest at the beginning.

Initially, the problem of absolute measurement of RNA abundance is discussed. There are some basic technical points, such as the danger that unstable mRNA species may be missed in a microarray hybridisation experiment unless careful attention is paid to extraction methodology. Scaling of data sets and non-linear responses (low signal-to-noise ratios and signal saturation) are tackled, then parametric and non-parametric methods of testing for significant change. Many students will find some useful general explanations of the principles of data analysis, such as how the probability of false positives and false negatives changes with the number of replicate experiments. There follow sections on principal component analysis, hierarchical and K-means clustering, function prediction, reverse engineering of regulatory networks and building classification methods.

Methodology is illustrated for the most part by use of small imaginary data sets, giving the beginner a ready insight into the mathematical or statistical principles at work. There is a useful discussion of data formatting and the advantages and limitations of common software such as Excel. Interfacing large microarray data sets with clinical and other types of biological data remains an important problem. There are clear recommendations in favour of Unix or Line operating systems and Perl or Auk for programming. A very good selection is offered of web sites from which free software can be obtained, including that of the author. The reading list is useful up to 2001.

This is a field in its infancy. Unfortunately, there are few examples given of how microarrays have contributed to the advance of biology. The field is plagued by poor experimental design and success depends on a combination of a good experiment and, to a significant extent, an intuition for the key observation. Inspiring results have been achieved on a few occasions and students would have benefitted from seeing some actual examples of how the methodology described in this book has contributed to a successful outcome. Nonetheless, I'd recommend anyone setting out to use this methodology to buy a copy for the lab.

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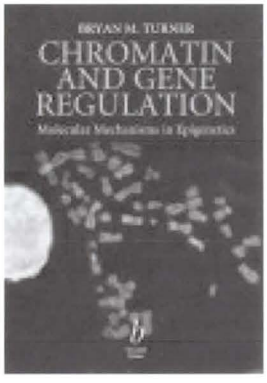
Chromatin and Gene Regulation: molecular mechanisms in epigenetics

Bryan M Turner



Chromatin and Gene Regulation: molecular mechanisms in epigenetics
Bryan M Turner
Blackwell Science (UK)
18 December, 2001
ISBN 0865427437
Paperback - 288 pages

Chromatin consists of repeating units of DNA and proteins called histones that form a DNA binding complex called a nucleosome. The winding of DNA around these protein structures is essential for packaging the vast amount of DNA contained within each cell into a manageable size and form. While this is an important function of chromatin, this book is most interested in a second property - the ability to carry epigenetic information. This comprises instructions to control the regulation of genetic information through modifications in the association of transcription regulatory proteins. The book has an excellent introduction to gene transcription, including interesting digressions on the evolution of transcriptional complexity from prokaryotes to higher organisms. The concept of chromatin structure and function is introduced gradually and described clearly in a methodical style. Later chapters explore the mechanisms by which chromatin can influence gene expression through subtle structural alterations that affect the accessibility of DNA to transcription initiation proteins.

This gentle progression through the many levels of gene regulation makes this difficult subject easy to understand. The book can be read cover to cover, while the clear chapter layout allows students to dip in at any point. This book is ideal for students and researchers wishing to learn more about this rapidly developing subject.

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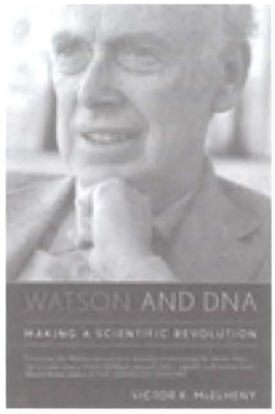
Watson and DNA: making a scientific revolution

Victor McElheny



Watson and DNA:
making a scientific revolution
Victor McElheny
John Wiley & Sons 2003
0470854294
366 pages

Can you imagine a time when only about 50 people in the world were interested in DNA structure? When no one knew what a gene actually was? We seem to have come a long way in 50 years, although people are still struggling to identify genes simply by scanning the genome sequence. This book guides us along this path, following the life of Jim Watson.

A brief description of his upbringing culminates in Watson hearing about the work of Oswald Avery which inspired him to study genetics in graduate school. A PhD in Indiana was followed by some wanderings around European laboratories looking for a post-doctoral topic and position. The impression of the first half of Watson's life, apart from his time in Cambridge, is of someone never quite sure where to go and what to do next with his scientific career. His work with Crick at the LMB has been well covered and is described in detail here. The novel aspect for me was appreciating how this field went from being rather esoteric to something of interest to the general public within a few months. While Crick and Watson were famously cautious in the original Nature paper ('It has not escaped our notice …'), within a few weeks Max Delbruck wrote Watson that if the model were correct, 'all hell will break loose, and theoretical biology will enter into a most tumultuous phase'. The lay press picked up the story soon afterwards, with articles in *The Times* and the *New York Times* amongst others.

From Cambridge, Watson moved back to the US and turned his attention to RNA. Again, we are given the impression of someone searching, not just for scientific answers, but also for something to act as the focus of his life – this time made worse by the sense of anticlimax after the excitement of the double helix. The answers come with running a lab of his own, in Harvard, then moving on to running a whole institute at Cold Spring Harbor. Never an experimentalist, Watson seems to have preferred selecting bright people and encouraging them to work together or in friendly competition to solve problems that he found interesting. He was generous with ideas; usually initiating projects then content to leave his name off the papers that resulted once others had done the lab work.

In the years to come, Watson's achievement at Cold Spring Harbor Laboratory may rank alongside the elucidation of the structure of the double helix. Victor McElheny worked there during the time that Watson was changing it from a ramshackle Laboratory that had seen better days and was losing out to more fashionable institutions in more central locations to a major centre with world-class laboratories, a conference programme that attracts capacity audiences every year and a thriving Press. This, for me, was the most interesting part of the book. We see Watson as the scientific leader, dropping in on his staff at all hours to chat about their work, and as a shrewd operator, cajoling funds from the Lab's rich neighbours on Long Island.

Finally, there is Watson's third endeavour, which was not his original idea but which came to be associated with his name, particularly to the general public – the Human Genome Project. The book describes the early planning, the arguments for and against, the efforts to convince biologists that it was a worthwhile project and then to raise the money to see it through so that it did not detract from the funding of science already in progress. Again, we get a picture of Watson as an operator, as in the early decision to focus on the infrastructure of the genome rather than genetic diseases: 'After heated debate, Watson signaled [Norton] Zinder to call a vote, and the infrastructure advocates won. … It was a watershed meeting, controlled almost silently by Watson.'

The whole book is packed with quotes, all referenced, which can make it heavy going for a lay reader, but which provide a good feeling of first-hand experience to anyone familiar with at least some of the science and the scientists who feature. While you may feel that you have heard enough about the discovery of the double helix recently, there is plenty more in this book to keep you turning the pages.

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DNA Microarrays: A molecular cloning manual

David Bowtell and Joseph Sambrook

'DNA microarrays' is a detailed list of protocols for using microarrays. It covers the methodology for the use of spotted DNA microarrays on glass and Affymetrix chips for genomic analysis, analysis of gene expression and identifying DNA–protein interactions. The need for this book was realised by the academic DNA microarray field and the book is the product of the recent DNA microarray meeting at the Cold Spring Harbour Laboratories.

With microarrays being a relatively new discipline, it was decided that techniques being generated in academic labs needed to be made widely available to researchers worldwide. What's more, with the rapid advances occurring in this field, tight dead-

lines were set for the authors of various protocols, making the publication of this book almost as high-throughput as the technique itself!

DNA chip technology is essentially an extension of the Southern blot, though with probes and targets having reversed physical location. The authors describe this and many other aspects surrounding microarrays in information boxes, making interesting discussions of this type characteristic of this text. Appropriately, Ed Southern, the founding father of so-called parallel processing, has contributed the foreword. He sums up the essence of and need for microarrays. 'The Sanger legacy [of high-quality public sequence information] leaves us with the challenge of progressing from sequence to function for genomes and organisms of high complexity'. He stresses that we are faced with the problem of combining new experimental techniques with the powerful computing tools we have to understand gene expression and genomic DNA variation. In particular, there is a need to design high-throughput protocols to match the capacity of information technology. So '*DNA Microarrays*' serves not only as a useful tool in its own right, but also as an example of the advantages of greater academic communication and publications like this one, to aid progress in the growing armoury of experimental techniques.

At first glance, this book seems very daunting; indeed for most I'm sure the title itself doesn't instil a great deal of enthusiasm! However, a quick flick through reveals a logical and accessible organisation, ideal as a text for thorough reference. It is exactly what it claims to be – a molecular cloning manual.

The book runs logically through each step of the microarray process from generation of probes to bioinformatic analysis of the wealth of information that this technique produces. At each step, a variety of different scenarios are explored, from the use of a range of different DNA sources to different applications. With a range of in-depth protocols at each step and for many different scenarios, this book is a wonderful laboratory manual not just for the use of microarrays but also for many other molecular biological techniques, from microdissection through PCR to identifying DNA–protein interactions.

The book has very useful information concerning the purchase of materials from manufacturers, whilst always emphasising the possibility for smaller laboratories to synthesise their own chips in an attempt to make this technique more widely accessible. This is of great importance considering the huge expense of the procedure if done commercially. The sections of the book that particularly appealed to me were the information panels. These give the theoretical background of many of the methods used, which is often hard to find out.

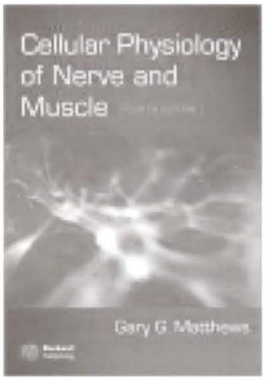
This is certainly a valuable reference book to have to hand. As a guide in the process of performing microarrays it is complete, thorough and the most up-to-date information in the field. It will shortly be accompanied by a companion web-site that should be useful for DNA microarray practitioners, providing links to bioinformatics resources, manufacturer details and the latest developments. The main drawback is the cost at £150, so it is worth encouraging your library to stock a copy!

DNA Microarrays:
A molecular cloning manual
David Bowtell and Joseph Sambrook
Cold Spring Harbor Press
0-87969-624-9 Hardcover
0-87969-625-7 Paperback
712 pp 2003

Dagan Jenkins, MRC Research Student, Institute of Child Health

Cellular Physiology of Nerve and Muscle

Gary G. Matthews



Like many PhD students, I came to understand some concepts important for my project only whilst writing my thesis. I was interested in how light is converted to a nerve impulse in retinal rod cells, but I was in a biochemistry department and had only a foggy memory of undergrad electrophysiology. If I had read this book at the start of my PhD in 1981, I might have made wiser decisions and faster progress.

Hidden in that sentence are the good and bad aspects of this book. Good because it provides a clear account of the origin of membrane and action potentials without burying the reader in maths. Bad because most of the current text could have been written well before 1981, although the first edition actually appeared only in 1986.

The book comes in three parts. The first, on the origin of membrane potentials and control of cell volume, is excellent, leading the reader to a fair understanding with useful appendices. The second part describes neural action potentials and synaptic transmission. An historical account of the Hodgkin/Huxley/Katz experiments beautifully portrays how brilliant deductions derived from careful observation on home-made equipment led the field, but does not intrude on the concepts. The third, and weakest, part covers the electrophysiology of skeletal and cardiac muscle. As the title advertises, but nevertheless disappointingly given current excitement, there is no coverage of the electrical and mechanical properties in other cell types that build on the foundations laid by studies in nerve and muscle.

Cellular Physiology of Nerve and Muscle
Gary G. Matthews
Blackwell Science
October 2002
ISBN 1-4051-0330-2
4th edition. Paperback 256 pages

Despite its clarity, the book has an archaic feel that many will remember from undergrad physiology: molecules are left in the background, the focus is on ions and charge movements. A description of single channel properties and how they originate from protein structure appears, but apparently as an afterthought. I wonder whether building upwards from biochemistry to reveal the emergent beauty of electrophysiology might be more intellectually satisfying. The section on synaptic transmission is more modern, but somehow does not ring with the excitement that currently surrounds studies of synapse function and modulation. The fusty smell gets particularly strong in the muscle contraction chapter, where the opportunity is missed to describe the recent single molecule work on myosin and draw analogies with single ion channel studies. For cell biologists excited by the possibility of understanding cell mechanics and motility in the quantitative detail currently available only to electrophysiology, this omission is particularly saddening.

In summary, for those wanting to get to grips quickly with the basics of electrophysiology this is a good easy read. Those wanting to get a feel for the excitement of current research in the electrical and mechanical properties of nerve and muscle should look elsewhere.

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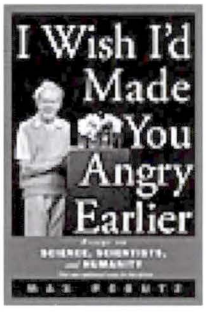
I Wish I'd Made You Angry Earlier

Max Perutz



I wish I'd made you Angry Earlier
Max Perutz
Cold Spring Harbor Laboratory Press 2002
0-87969-674-5; 486 pages

This year's celebration of the 50th anniversary of the discovery of the structure of DNA has led to an outpouring of reviews and books reminiscing about the early days of molecular biology and the disciplines from which it arose. A key player in that discovery was Max Perutz who unfortunately died last year. He was a superb scientist but also an excellent organizer and motivator of other scientists. At the memorial meeting in honour of Sir John Kendrew held in Cambridge in 1997, Perutz said:

"John and I shared three great scientific adventures: founding the MRC Unit for Molecular Biology, solving the first protein structure and founding the European Organization for Molecular Biology (EMBO)."

Perutz was also a renowned communicator, as reflected in this collection of his writings, republished with nine additional essays. Several of these are book reviews; my favourite was the description of Francois Jacob's 'The Statue Within', probably because I was familiar with the original (which is thoroughly recommended to anyone who has not read it).

The sections, 'How to make discoveries' and 'Rights and wrongs' were written for a lay audience, but are fascinating accounts of scientific endeavour and serve as useful reminders that there was biology before the era of gene manipulation. In 'What holds molecules together?', Perutz explains the excitement generated by Linus Pauling's valence bond theory and how it 'transformed the chemical flatland of my earlier textbooks into a world of three-dimensional structures.' Pauling is better known to biologists as the 'loser' in the race to determine the structure of DNA but he was already a giant amongst scientists and Perutz reminds us of his many contributions to both chemistry and biology.

The most appealing element of the scientific essays for me was the sense of being there: Max Perutz talks about the leading scientists of the 20th century as friends and colleagues. There is also a section on human rights and the issues that arise from the application of science in areas such as human reproduction, population control and nuclear energy. Finally, some of the essays are autobiographical, recalling episodes of Max Perutz' life, most notably his deportation to Canada at the start of the Second World War. He describes what must have been a most depressing period with wry humour and sheds light on an oft-forgotten part of history.

In looking through the book again, I continue to find snippets to amuse or enlighten, and would recommend anyone to dip into this should they have the chance.

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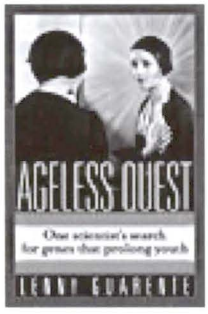
Ageless Quest: One scientist's search for genes that prolong youth

Lenny Guarente



Ageless Quest: One Scientist's Search for Genes That Prolong Youth
Lenny Guarente
Cold Spring Harbor Laboratory Press 2003
0-87969-652-4
154 pages

As aging is a very obvious and sometimes annoying process, people have searched for a long time for explanations for this process or even tried to stop it in sometimes dubious ways.

Many theories have been formulated, from the 'wear and tear' theory to more sophisticated ones such as the rate-of-living theory or the telomere model. But none of these proved to be the universal explanation of aging.

The author of this book has attempted a so far new approach to address this burning question. In his book he describes two stories: one is his own, how he was hooked on this venture. From his personal point of view he describes the highs and lows of a man of science. On the other hand, he gives an insight into his research, from the first trials with magnetically labelled yeast mother cells, through food restriction in *Caenorhabditis elegans*, to homologous genes in yeast, worms and humans.

Lenny Guarente describes the development of a thought into an assay and from there to a theory. He allows us to participate in the discovery of SIR2, its function in the cell and how it was shown that SIR2 homologues could 'extend life spans in different organisms in which the direct cause of aging were very different'. He illustrates how in mammalian cells a higher level of the SIR2 homologue suppresses apoptosis and thus links his research on yeast to the process of aging and cancer generation in mammalian cells. He also reflects on calorie restriction, a long discussed possibility for prolonging lifespan.

I thoroughly enjoyed reading this book as the author understands how to describe the complex schemes of his area of research in an understandable way even for the interested lay reader. Thus, I can highly recommend this book to anyone who would like to read a good story with a scientific background.

Tanja Mack, Konstanz

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Books for review

Fancy reviewing a book? If so, choose one from the selection listed below. Alternatively, if there is a book you would like to review that is not included here, contact me (jmarsh@wiley.co.uk) and I will request a review copy from the publisher.

Advanced Genetic Analysis, *Hawley & Walker, Blackwell Science*

Chromosomes: organization and function, *Sumner, Blackwell Science*

Responsible Conduct of Research, *Shamoo & Resnik, Blackwell Science*

Molecular Biology of the Cell, 4th Edition, A Problems Approach *Wilson & Hunt, Garland*

Molecular Infection Biology: Interactions between microorganisms and cells *Hacker & Heesemann, Wiley*

Culture of Epithelial Cells, 2nd edition *Freshney, Wiley*

In Silico Simulation of Biological Processes *Novartis Foundation symposium, Wiley*

From Genes to Genomes *Dale and von Schantz, Wiley*

Biochemistry and Molecular Biology of Plants *Buchanan, Gruissem and Jones, Wiley*

Washed up in San Francisco

As one of the lucky winners of the BSCB Young Cell Biologist of the Year award at the 2002 Spring meeting in York, I was one of nearly 10 000 people who attended the ASCB Annual Meeting in San Francisco in December.

Alex Dammermann

With such a large number of people it's easy to feel lost and lonely. I was fortunate to be travelling together with a sizeable contingent from Edinburgh, so I was never short of people to hit the town with when the science got too much. There were also many familiar faces from previous meetings and it was nice seeing them all again. This meeting was my first opportunity to get to know my future colleagues in Karen Oegema and Arshad Desai's labs at UCSD where I will be starting a post-doc later this year.

Travelling to San Francisco from Scotland, I was looking forward to a few nice days in 'Sunny California'. Imagine my disappointment, then, when I found a typhoon had decided to visit the Bay area at the same time. So for the entire duration of the meeting it was raining more or less non-stop.

The meeting itself was big. The Moscone Center where it was held has the size (and charm) of an airport terminal, and the programme and abstract books took a while to get used to. Apart from the large plenary sessions, the meeting was split into several smaller minisymposia running concurrently so that, as with the innumerable posters presented each day, one had to be selective.

Before the conference was officially opened on Saturday there was an interesting subgroup meeting in the afternoon on new developments in RNAi technology organised by Tim Stearns, where speakers presented new ways of silencing gene expression in vertebrate cells.

RNAi is used so widely in cell biology these days that it is surprising how poorly understood the underlying cellular mechanisms really are and how little data are available on how to select your oligonucleotide sequence.

In the Keynote Symposium, Steven Block gave a stimulating talk on the challenges presented to society at large and scientists in particular by the threat of biological weapons and the need to protect academic freedom from excessive government interference. If some of the remaining talks were rather dry, the drinks reception immediately afterward came as a welcome relief.

Over the next few days there were so many good talks that it is difficult to single out one or two. Of course I am somewhat biased, but I particularly enjoyed Ahna Skop's talk in Sunday's minisymposium on cytokinesis. She has used a proteomic approach to identify the protein constituents of the mammalian midbody and then tested their involvement in cytokinesis by depleting their *Caenorhabditis elegans* homologues with RNAi. Her key finding is that many of the proteins required for cytokinesis function in vesicular trafficking,

Below: San Francisco cable car

Following page: Alex Dammermann and a friend in Yerba Buena Gardens (near the conference centre)
Photos by Nadia Korfali.

emphasising the importance of membrane addition in cleavage, something that has not been widely appreciated.

I should also mention the minisymposium on Mitotic Spindle Assembly and Function organised by Rebecca Heald and Tim Yen, which many people attended despite it taking place in the afternoon on the last day of the conference.

Then there were the poster sessions. They were a good opportunity to talk to people about their research and to get practical advice. My own poster was under scrutiny on Monday, together with that of my fellow PhD student from our lab, Xavier Fant, who presented his data on cell cycle-dependent modifications of the pericentriolar material.

With our posters on adjacent boards, we had a competition going for who would generate more interest (he won). Taking a break from the posters, one could browse the company stalls and collect freebies such as mouse mats, laser pointers and other more or less useful accessories.

All in all, it was a most enjoyable conference and I would like to thank the BSCB for making my attendance possible.

Alex Dammermann
University of Edinburgh

The Cell and Molecular Biology of Cancer
Lausanne, Switzerland, 22–25 January 2003

The fourth Cell and Molecular Biology of Cancer Meeting was organised by Richard Iggo, Daniel Constam, Pierre Gonczy, Wilhem Krek, Matthias Peter and Viesturs Simanis. Forty speakers and almost 200 posters covered a wide spectrum of fundamental research, and the overall message of the meeting was really that to understand the mechanisms of cancer, it is important to be able to link different fields of investigation. The conference was in Lausanne and many of the participants took advantage of the location and the good snow conditions to enjoy some skiing after the conference ended. Owing to the diversity of subjects covered, we have chosen to highlight just a few talks that we found of particular interest and we apologise to those speakers whom we don't mention.

Johanna Abbott and Isabel Alvarez

The meeting opened with a wonderful description by **David Livingston** (Boston, USA) of the latest advances in understanding why women carrying mutations in the *BRCA1* gene are much more likely to develop premature breast or ovarian cancer. The breast cancer tumour suppresser BRCA1 is a very large nuclear protein of unknown biochemical function which appears to be involved in the control of genome integrity.

David's group has observed that in the nuclei of female somatic cells a fraction of the BRCA1 is localised on the inactive X chromosome (Xi), where it appears to control the proper localisation of *Xist* RNA and histone MH2A on Xi. BRCA 1 tumour cells lack Xist and MH2A staining, suggesting that BRCA1 may contribute to the maintenance of a proper Xi heterochromatin superstructure.

The first session was devoted to Cell–Cell Communication. **Randall Moon** (Seattle, USA) gave a talk entitled "Nuclear partners of β-catenin". β-catenin signalling is involved in regulating development and can play a role in carcinogenesis when inappropriately activated. In a screen to identify novel factors interacting with β-catenin, his group identified Chibby, a nuclear protein that is highly conserved across species. Gain of function of Chibby represses β-catenin-mediated gene activity in cultured cells; conversely, loss of function increases activity. Chibby competes with LEF1 for binding of β-catenin and, interestingly, is down regulated in uterine and thyroid cancers, suggesting that it may function as a tumour suppressor.

Also identified in the screen was Creb Binding Protein (CBP), known already as a transcriptional co-activator of β-catenin. The Moon lab has identified a small, soluble lead compound which inhibits the interaction between CBP and β-catenin and which inhibits the proliferation of colorectal cancer cells in culture.

The second session of the day was "Signal Transduction and Development". **Matthew Freeman** (Cambridge, UK) discussed his lab's work on Rhomboid, a member of a family of intramembrane serine proteases. Rhomboid is involved in regulation of EGF signalling in *Drosophila*. Rhomboid cleavage releases the luminal domains of EGF receptor ligands Spitz, Gurken and Keren, which can then be secreted as active growth factors. In other species, Rhomboid homologues also function in regulation of the mitochondrial membranes. Freeman's group has identified three mammalian homologues bioinformatically, for which there are 20–30 putative substrates in the mouse genome.

The next day began with a session on G1/S control/ DNA replication/Telomeres. **Joachim**

Lingner (Lausanne, Switzerland) discussed the identification and characterisation of hEST1A, a human homologue of Est1p from *Saccharomyces cerevisiae*. The latter is an essential component of the telomere machinery, possibly acting as an activator of telomerase. hEST1A is associated with telomerase activity; overexpression induces anaphase bridges and chromosomal end-to-end fusions despite the presence of telomeric DNA at the sites of fusion. The telomere protection factor TRF2 is not displaced by hEST1A uncapping, so Lingner suggests that the function of hEST1A may be to remodel the telomere structure in S-phase to allow telomerase access.

Rene Bernards (Amsterdam, The Netherlands) impressed us with a quick and 'cheap' way to generate stable loss-of-function phenotypes in mammalian cells. To improve the efficiency of the RNA interference assays, his group has designed a mammalian expression vector that promotes the synthesis of synthetic short interfering RNA (siRNA)-like structures. The vector is called pSUPER (suppression of endogenous RNA) and stably reduces the expression of the gene of interest. Using this vector, they have already studied the effect of loss of expression of more than 100 genes.

Bernards also talked about familial cylindromatosis, a rare autosomal dominantly inherited tumour syndrome caused by the loss of the *cylindromatosis* tumour supressor gene (*CYLD*). CYLD supresses the anti-apoptotic factor NF-κB and loss of CYLD in cancer cells disturbs the balance between growth and apoptosis. It is known that aspirin reverts NF-κB activation and a clinical trial is now underway to test whether treating familial cylindromatosis tumours with aspirin will induce the cells to apoptose.

The second session of the day covered cell cycle checkpoints and chromosome dynamics. **Kim Nasmyth** (Vienna, Austria) clearly explained how cohesin and separase function in sister chromatid separation. Cohesin is a multi-subunit complex (Smc1, Smc3, Scc1 and Scc3) that is essential for holding sister chromatids together from DNA replication until the onset of anaphase. Smc1 and Smc3 form a coiled-coil heterodimer with a hinge domain between the two subunits.

Nasmyth's group has shown that the N terminus of Scc1 binds the Smc3 part, and the C terminal the Smc1 part, of the Smc1/3 heterodimer. This forms a ring structure which is large enough to encircle the sister chromatids. Scc1 cleavage at the metaphase-anaphase transition releases cohesin from the chromatids but the cohesin complex will dissociate if the circle is cleaved at any point.

The final day of the conference saw sessions on cell division and cell migration/tumour-host interactions. **Erich Nigg** (Martinsried, Germany) changed our understanding of the molecules that allow us to follow the (in)activation of the spindle checkpoint. He showed the different dependencies of the association of Mad1, Mad2, Hec1 (a homologue of Ndc80, a component of the SPB of yeast) and Mph1 to the kinetochore. Mad2 and Hec1 bind to Mad1 in different areas and the kinetochore association of the Mad1/Mad2 complex depends on both Hec1 and Mph1. Using Hec1 siRNA his group demonstrated that the lack of detectable Mad2 at the kinetochore does not necessarily mean that the spindle checkpoint is off.

Conly Rieder (New York, USA) gave a characteristically enthusiastic talk on DNA damage and mitotic progression in human cells. Radiation damage during early-mid prophase induces mitotic delay via the ATM pathway but minor irradiation in late prophase does not cause delay as the cells are already committed to division. However, Rieder's group has discovered that severe irradiation of late prophase cells, or treatment with TopoI inhibitors such as ICRF-193 or adriamycin, does induce a mitotic delay of 6–8 hours. This occurs after the formation of a normal bipolar spindle and after destruction of cyclin A and is ATM/p53 independent.

Examination of the cells revealed that one or more kinetochores were invariably Mad2 positive. If arrested cells were injected with dominant-negative Mad2, they exited mitosis rapidly, demonstrating that at this stage in the cell cycle, the damage activated the spindle assembly checkpoint rather than the conventional ATM-mediated damage checkpoint pathway.

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Sue Biggins (Seattle, USA) gave a very interesting talk about the dynamic localisation and a new function of the budding yeast Ipl1/Aurora protein kinase. Her group has found that Ipl1 has role in mitotic disassembly that is not a consequence of a delay in mitotic exit or a prior defect in chromosome segregation.

Mutants in Ipl1 have defects in spindle breakdown but these are not due to a gross alteration of the structure of the spindle midzone, since all the midzone proteins tested still displayed wild-type localisation in the Ipl1 mutants. Consistent with its role in spindle disassembly, Ipl1 kinase activity increases just before spindle breakdown.

On the other hand, using live microscopy, Biggins' group revealed a previously unidentified localisation pattern of Ipl1. At anaphase, Ipl1 is transported along the spindle to the midzone and then tracks the plus ends of the depolymerizing spindle microtubules back to the poles. It is not yet clear if Ipl1 binds to microtubules directly or indirectly.

In the afternoon, **Cathrin Brisken** (Lausanne, Switzerland) described "Genetic dissection of signalling pathways in breast development and breast cancer". The prolactin receptor and its ligand are upregulated in breast cancers. Her lab is using a mouse model in which prolactin has been knocked out in just the breast to investigate how prolactin controls breast development.

They observed that cyclin D1 is frequently overexpressed in breast cancer and that homozygous null females do not feed their pups. Expressing prolactin failed to rescue the breast phenotype, implying that cyclin D1 acts downstream of prolactin in breast development. A screen to look for factors mediating the signal between prolactin and cyclin D1 identified Insulin-like Growth Factor 2 (IGF2), which has previously been implicated in many cancers. They found that IGF2 mRNA colocalises with the prolactin receptor and that transient expression of IGF2 in the prolactin knock-out induces cyclin D1. IGF2 was also found to be induced by prolactin. Prolactin therefore works via IGF2 to activate cyclin D1 and thus regulate breast development.

The meeting brought together researchers working in diverse fields on different organisms but linked by a relevance to cancer and illustrated the importance of cross-talk between different areas in trying to understand such a complex disease. We are extremely grateful to the BSCB for giving us the opportunity to attend this meeting.

BSCB/BSDB Spring Meeting
Genomics and Proteomics in Cell Biology
University of Warwick, 8–11 April 2003

Signalling and Growth Control

A major focus of the 2003 Spring BSCB meeting was the application of sophisticated screening methods to identify signalling components of the most diverse biological processes. The first session chaired by Julian Downward was a great introduction to this theme, emphasising the usefulness of expression screens in the analysis of human pathologies such as cancer and inflammation.

Margareta Nikolic

Tewis Bouwmeesteer (Cellzome AG, Heidelberg, Germany) began by describing a strategy taken by Cellzome to exploit available chemical entities and proteomics to obtain insights into the molecular mechanisms of coordinated cellular processes. The signal transduction pathways triggered by TNFα in inflammation, Alzheimer's disease, rheumatoid arthritis and chronic obstructive pulmonary disease were singled out as the major points of interest.

A search of the whole human proteome using tandem affinity purification, with known protein baits from the TNFα pathway, coupled to mass spectrometry identified 601 potential interactors of which 266 were known (such as the MAP kinases), while 416 were novel (such as CZ00067, a MAP3K regulator). The biological role of each interactor was investigated using small inhibitory RNAs (siRNAs). In addition, a chemical proteomic strategy was described that aims to study how drugs affect signalling proteins in the cell. Several inflammatory drugs, such as sesquiterpene lactones, sulindac derivatives, parthenolide and FK506, were coupled to beads and associated proteins were identified by mass spectrometry. It is clear that this part of Cellzome's research has uncovered a wealth of information. The challenge now is to use it to improve our quality of life.

David Prowse (Cancer Research UK, London) used Foxn1 and β-catenin oestrogen receptor fusion proteins to investigate the regulation of stem cell fate, differentiation and tumorigenesis. Inducible activation of Foxn1, a forkhead transcription factor, inhibited putative stem cell clonogenicity and induced differentiation of cultured primary human keratinocytes. This activation of Foxn1 induced over 30 genes within 24 hours, including markers of differentiation as well as potential regulators of proliferation and cell survival, notably the kinase Akt. In contrast, β-catenin activation in primary human keratinocytes did not significantly alter gene expression. This was consistent with the observation that activation of β-catenin *in vivo* did not grossly affect the interfollicular epidermis but specifically promoted hair follicle growth and tumorigenesis. Future work will identify the genetic changes induced by β-catenin in this system.

The cancer theme was continued by **Stefan Grunert** (IMP, Vienna, Austria) whose interests were the molecular mechanisms underlying epithelial plasticity and tumour progression. Comparisons were made between cells undergoing epithelial to mesenchymal transition and those that were not. Over 2000 genes were differentially expressed; particular emphasis was given to the PDGF receptor and tenascin C pathways, both of which were induced after this transition. A doubling of PDGF receptor signalling was reported to activate PI3 kinase sufficiently to prevent apoptosis. On the other hand, activation of tenascin C upregulated the focal adhesion kinase (FAK), thought to

trigger loss of cell adhesion and promote metastasis. This was not thought to involve PI3 kinase.

Alexander Henzing (Wellcome Centre for Cell Biology, Edinburgh) was concerned with the function of different caspases during apoptosis. He successfully synthesised several effective and irreversible inhibitors, which he used to affinity purify human caspases (1-10) from apoptotic cell and tissue extracts. This allowed him to obtain detailed kinetic parameters of the different caspases throughout several stages of apoptosis. The major challenge that lies ahead is the use of the inhibitors to purify, from apoptotic cell lysates, caspases coupled with their associated proteins.

Julian Downward (Cancer Research UK, London) ended this session appropriately by bringing together the issues of cell death and transformation. He presented us with the intriguing question, whether targeting survival pathways can lead to the specific death of tumour rather than normal cells. Survival of a normal cell depends on several signalling pathways, the coordinated function of which regulates the intricate balance between life and death. On the other hand, life in tumour cells generally depends on a single signalling pathway that has perturbed this balance and results in cancerous growth.

Julian described a number of approaches currently undertaken in his laboratory to explore how Ras affects cell survival. One is to create an siRNA library of over 8000 human genes, which will be used to identify individual proteins that normally act as suppressors of Ras-induced transformation. Another approach has been to search for substrates of kinases known to function in the Ras signalling pathway, such as Akt, leading to the identification of the Yes-associated protein (YAP), a known transcription co-activator.

"70 per cent of the risk of an experiment working is determined before you touch the first test-tube"
Henry Sun

Cytoskeleton and Cell Division

The second session focused on the identification of molecular mechanisms responsible for cell division.

Buzz Baum (UCL, London) entertained us with the question that is on many of our minds: 'How is a cell and ultimately an organism, such as *Drosophila*, assembled from small bits of information?' He emphasised the importance of the actin cytoskeleton during this assembly process, in governing cell shape, movement and polarity.

Buzz's laboratory utilised a cup of coffee, a £50,000 microscope and a genome-wide RNAi screen in *Drosophila* to identify important genes that regulate cell shape. Examples are myospheroid (an integrin), talin and tenascin. On the other hand, cytokinesis defects were seen in the absence of functional Pbl (an exchange factor), Rho1 and CG10522 (a citron kinase). Analysis of the intricate relationship between Abi and Scar in the regulation of lamellipodia and filopodia led to the proposal that similar sets of actin regulatory proteins have cell type-specific morphological effects.

Andrew Chalmers (University of Cambridge) described how cells of the *Xenopus* blastula regulate their fate by controlling their plane of division. He examined the spindle orientations of individual cells, classing them as parallel, perpendicular or oblique and correlated them with the shape of the dividing cells. Thus, a small apical surface and large basolateral surface induce a perpendicular division, generating a superficial cell containing atypical PKC and induced ESR6e. In contrast, the deep cell expresses integrins and lacks ESR6e, predisposing it to become a neuron.

The complex pathways that regulate mitosis have been studied by **Ahna Skop** (UC Berkeley, USA). She was particularly interested in identifying the proteins responsible for midbody formation in dividing cells at late anaphase. Using tandem liquid chromatography coupled with mass spectrometry, she identified 160 different proteins assembled in mammalian cell midbodies. Their role in cell division was investigated using the siRNA approach in *C. elegans*, where 91% of the identified proteins were conserved. Many proteins were indirect regulators of the cytoskeleton; for instance, loss of IQGAP caused defects in meiosis, while loss of Rack1, a membrane anchor for PKC, caused late cytokinesis defects resulting in multinucleate cells.

The largest proportion of identified proteins were involved in vesicular trafficking and endocytosis. A

good example is dynamin, the loss of which resulted in multinucleate cells as well as additional non-mitotic defects. On the other hand, the absence of functional endoplasmin (a Ca^{2+} chaperone) caused metaphase plate disorganisation and lagging chromosomes at metaphase.

Aaron Straight (Harvard Medical School, Boston, USA) continued the mitotic theme. Major interests of his laboratory are to determine how the cell cycle is coupled to cell division and to define the role of the mitotic spindle in specifying the plane of cell cleavage. They have tackled this complex problem by generating blebbistatin, a potent and specific inhibitor of myosin II.

Exposure of dividing cells to blebbistatin prevented cleavage furrow formation due to the absence of a contractile ring, while chromosome separation and nuclear formation progressed as normal, resulting in binuclear cells. The combined use of blebbistatin and microtubule (nocodazole), F-actin (latrunculin), general kinase (staurosporine) and Rho kinase (Y27632) inhibitors provided further insight into the temporal and spatial control of cytokinesis. Parameters such as chromosome positioning, cytoskeletal organisation, the formation of midzone structures, coupled with subcellular localisation of the actin binding/bundling protein anillin, were examined.

Rebecca Hames (University of Leicester) was interested in centrosome organisation and positioning during cell division. She focused on understanding the role of Nek2, a cell cycle-regulated serine/threonine kinase, and its substrate C-Nap1, primarily in regulating intercentriolar linkage.

Her strategy was to look for C-Nap1-interacting proteins using a yeast two-hybrid screen. A novel 18 kDa protein was identified and named BPC-1 for Binding Partner of C-Nap1. BPC-1 localisation to centrosomes was found to be independent of microtubules and its overexpression in cultured cells did not induce any adverse phenotypes. However, co-expression of BPC-1 and Nek2A (with which it also interacted) rescued the Nek2A-induced centrosome splitting phenotype, suggesting that BPC-1 regulates Nek2A function.

The chair, **Julie Ahringer** (Wellcome Trust/Cancer Research UK, Cambridge) wrapped up this session by describing the strategy utilised by her laboratory to understand microtubule organisation and cell polarity in *C. elegans*. RNAi technology was used to generate loss of function mutations in 86% of the total *C. elegans* genome, of which 10.3% have been identified so far. Some of these proteins have been previously associated with cytoskeletal regulation during cell division, however, interestingly, the major-

"In God we Trust, everyone else must show controls"
Henry Sun

Undergraduate Bursars

This year, for the first time, the BSCB offered bursaries for undergraduates to attend the Spring Meeting. Three students were selected who report on their experience below. The BSCB will repeat this offer next year, so all cell biology lecturers will be encouraged to nominate suitable candidates in January 2004.

We are undergraduate students currently completing our honours degree in Molecular and Cellular Biology at the Universities of Glasgow, Brunel and Dundee. Our experience at this year's BSCB/BSDB meeting on 'Proteomics' was fantastic! Not only did we learn about some of the cutting-edge research, but also we were able to participate in discussions with experts in this field.

While one of us (Sonja) was part of a large group from Dundee, we others came on our own, but found people friendly and easy to talk to.

We have all accepted offers of PhD places for next year and feel that attendance at this meeting will give us a head start. We strongly recommend undergraduate students aiming to pursue a career in research to participate in next year's meeting taking place at the University of York!

Finally, we would like to thank the BSCB/BSDB organising committee and the University course co-ordinators for presenting us with this invaluable opportunity.

Many thanks, Bruno Fonseca, Hannah Critchlow and Sonja Flott

ity were not previously known. Particular focus was on the PAR proteins, which are essential mediators of polarity and are asymmetrically located in dividing cells. Julie's laboratory demonstrated that heterotrimeric G proteins lie downstream of the PARs in regulating asymmetric spindle organisation. Thus, loss of Gα signalling resulted in the absence of symmetry during the first division, while constitutive activation of Gβ prevented centrosome separation. In addition, her laboratory identified two *C. elegans* homologues of the activator of G protein signalling 3 regulator (gpr1 and gpr2) and demonstrated their role in regulating the forces that determine astral microtubule length and spindle positioning during asymmetric cell division.

Margareta Nikolic
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Transcription and Replication

A common theme of all the talks in this session, chaired by Julian Blow, was the application of systematic approaches to answering functional questions in transcription and replication.

Conrad Nieduszynski

Paul Harkin (Queen's University of Belfast) and **Peggy Farnham** (Madison, USA) discussed the use of microarrays to detect novel gene targets of human transcription factors.

Paul Harkin used oligonucleotide arrays to identify genes upregulated in response to activation of the BRCA1 tumour suppressor. Several components of the interferon-γ signalling pathway came out of the screen. Synergistic upregulation of a subset of these genes was seen with dual induction of BRCA1 and IFN-γ expression. This suggested convergence of the BRCA1 and IFN-γ signals on the STAT1 transcription factor.

Peggy Farnham combined chromatin immunoprecipitation (ChIP) with CpG island microarrays to identify novel promoter-binding sites for the E2F family of transcription factors. Human microarrays are generally made up of cDNA sequences and are therefore not appropriate when searching for promoter sequences. However, about 50 % of promoters contain CpG islands and such arrays are available.

Using the ChIP-CpG assay, Peggy Farnham's group identified hundreds of novel target genes, many of which can be regulated by multiple members of the E2F family, but some of which are specific for individual E2Fs. Increases in the sensitivity of the assay are allowing it to be applied to primary cells and tissue samples. This, together with the development of dedicated promoter microarrays, should allow a better understanding of the *in vivo* targets of the many human transcription factors.

Two complementary microarray approaches had been used to localise replication origins in budding yeast. **Oscar Aparicio** (Los Angeles, USA) used a ChIP-microarray approach to identify the chromosomal binding sites for two classes of origin-binding complexes: ORC and MCM. By looking for sites where both complexes were bound, he was able to identify accurately active replication origins.

Knowledge of the complete set of yeast replication origins might make it possible to elucidate the DNA sequences that define origins. Interestingly, he also reported that deletion of a histone deacetylase (*Rpd3*) advanced the firing time of some origins which would normally initiate late in S phase.

Anne Donaldson (Dundee) reported the use of a dense-isotope transfer technique combined with microarray analysis for identification of replicated DNA. This technology was used to determine the replication time of the whole genome in a yeast strain deleted for the *Ku70* gene. Telomeric and sub-telomeric DNA, which normally replicates late in S phase, became early replicating in the *Ku70* mutants. This effect extended as far as 200 kb from the chromosome ends – far further than previously thought.

Both of these talks emphasised the role of epigenetic chromatin modifications in the regulation of S phase.

Karim Labib (Manchester) described a systematic approach to identify the function of all essential

and previously uncharacterized yeast genes. When these genes are tagged with a 'degron' cassette, the resultant fusion protein can be rapidly destroyed by shifting the temperature to 37 °C. This was found to work for 60% of the selected genes and his lab is in the process of determining the phenotype of these strains.

So far three novel S phase genes have been identified, termed *CDC100*, *CDC102* and *CDC103*. These genes have mammalian homologues and their products interact in two-hybrid screens and by co-immunoprecipitation. ChIP revealed that their association with origins of replication is CDK-dependent and they are required for origin activity.

Julian Blow (Dundee) introduced a proteomic approach to identify chromatin-associated proteins using the *Xenopus* cell-free system. Chromatin was prepared from extracts at various cell cycle stages and the associated proteins were identified using mass spectrometry and analysed on 2D protein gels. The technology was successfully validated by looking at the differential association of DNA replication licensing factors.

Comparison of the various 2D gels revealed differential chromatin association of a large number of proteins. Further work should allow the identification of these proteins and characterization of their cell cycle-specific post-translational modification. These approaches may ultimately lead to the identification and charaterisation of all the genes involved in S phase progression.

Dr Conrad Nieduszynski
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Cell Adhesion and Extracellular Matrix

The session covered a wide variety of topics, ranging from fibroblasts in inflammation, to Wnt signalling in colorectal cancer, to carbohydrate receptors in the immune system.

Paul Crocker

Chris Buckley (University of Birmingham) described 'principal component analysis' of gene microarrays to identify differences between populations of fibroblasts in rheumatoid arthritis. The findings are consistent with a model in which fibroblasts regulate a switch from acute resolving to chronic persistent inflammation. This involves production of cytokines, such as type I interferon which promotes survival of T cells and TGF-β which induces expression of the chemokine receptor, CXCR4. This binds SDF-1 (CXCL12) released by the synovial fibroblasts, resulting in retention of T cells and maintenance of chronic inflammation.

Holly Colognoto (University of Cambridge) described a survival pathway emanating from interaction of α6β1 integrin expressed on oligodendrocytes with laminin 2 secreted by neuronal cells. Using RNAi approaches with cultured oligodendrocytes, she demonstrated that the Src-like kinase Fyn, but not Lyn, was important for activation of the MAP kinase cascade, leading to BAD-dependent survival. These findings may explain why *Fyn* null mice develop a hypomyelination defect.

Hans Clevers (University of Utrecht, The Netherlands) reviewed the remarkable recent findings of his laboratory on the Wnt pathway in normal epithelial differentiation and in colorectal cancer. Gene microarray analysis revealed that when dominant negative forms of the TCF transcription factor were expressed, about 120 genes were downregulated and about 115 genes upregulated. Detailed analysis showed that the downregulated genes were expressed in the crypt progenitor compartments of the colon and also in polyps. In contrast, the upregulated genes were markers of differentiated epithelial cells. These included the gene encoding ephrin-B1, a ligand for the tyrosine kinase receptors EphB2 and EphB3 which, in contrast, were both downregulated following inhibition of Wnt signalling. The possibility that the differential expression of these genes is important for positional localisation of cell populations within the intestinal epithelium was confirmed by studies on *EphB2/EphB3* null mice.

Victor Koteliansky (Biogen Inc., Cambridge, USA) described elegant studies on gene expression changes induced by extracellular matrix–integrin interactions. Using THP-1 monocyte-like cells binding to fibronectin, collagen type 1 or laminin, he observed that hundreds of genes were either up- or downregulated. Many of these could be

placed in signalling pathways leading to NFκB and MAP kinase activation and implicated in regulation of inflammatory and immune responses. The observation that fibronectin stimulated expression of three genes encoding enzymes important in athrerosclerosis led to studies examining atherotic lesions in *ApoE*-deficient mice crossed with *VLA-1*-deficient mice. As predicted, development of plaques was delayed in these mice and this was accompanied by decreases in lipid accumulation, macrophage infiltration and inflammation.

Sarah Newbury (University of Oxford) described studies on the *Drosophila* gene *pacman* which is highly homologous to the *S. cerevisiae* 5' to 3' exoribonuclease *XRN1*. Genetic studies showed that *pacman* is involved in at least four stages of development, with some phenotypes such as wing blister being similar to those arising from mutations in integrins. This work is being extended to *C. elegans*, in which the exonuclease has been shown to be important in ventral enclosure.

Finally, **Paul Crocker** (University of Dundee) described how genomics has led to the identification of a new subset of the siglec family of immunoglobulin-related sialic acid binding proteins. Previously characterized members of the siglec family mediate adhesive and signalling functions in the immune and nervous systems. In line with this, the novel 'CD33-related' siglecs are mostly expressed on cells of the innate immune system and have features of inhibitory receptors. The hypothesis that these proteins interact with sialic acids to dampen immune reactivity to host cells was explored using siglec-7 that is expressed on natural killer cells. Target cells were transfected with *GD3 synthetase*, leading to expression of GD3 at the cell surface as a high affinity ligand and this resulted in inhibition of cytotoxicity in a siglec-7 dependent manner.

In summary, this session highlighted the rapid progress being made using genomics-based approaches to unravel the functions and signalling pathways involving cell-cell and cell-matrix interactions in development, health and disease.

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Development and Tissue Assembly: Genomic approaches to developmental problems

For cell and developmental biologists, the promise offered by large-scale genomic approaches is beginning to be realised, with perhaps the best example being the genome-wide RNAi screens carried out in C. elegans. In this session we heard from speakers who are taking genomic approaches in plants, flies and vertebrates.

Stephen. N. Sansom

The session was opened by the chair **Rick Livesey** (Cambridge), who demonstrated the power of a genomic approach in investigating mammalian neurogenesis. Rick described work using microarrays to investigate neurogenesis in mice, including the transcriptional profiling of retinal progenitor cells and a successful screen for genes involved in neocortical patterning.

Steve Kay (Scripps Institute, San Diego, USA) followed with a dynamic talk comparing the components of circadian clocks identified by microarray analysis in plants, flies and mice. Interestingly, genes expressed at dawn and dusk were found to share distinct sets of promoter motifs, while genes expressed during the day often had combinations of both types of promoter. Steve went on to describe the development of a functional assay, automated with car factory robots, to screen candidate circadian clock regulators in a mouse cell line and discussed the possibility of using lentiviral vectors for rapid follow-up studies in the mice. This work indicated several possible future directions that high-throughput studies in mice may take.

Margareta Nikolic gave a beautifully illustrated talk based on her poster on work investigating the role of PAK-1 phosphorylation by p35/Cdk5 kinase. Notably, phosophorylated PAK-1 was found to mark the actively mitotic cells in the ventricular zone of the nervous system, growth cones and migrating cells.

Andrea Brand (Wellcome/CRUK, Cambridge) gave a stimulating presentation on the genomic approaches her lab is taking to understand neuroge-

nesis in the fly, including the use of specifically expressed RNA binding proteins to collect RNA for expression profiling, and a large-scale protein localisation screen using viral vectors to fluorescently label candidate genes. Andrea finished by describing an *in silico* search for neuronal genes that may be regulated by ubiquitinylation.

Bill Skarnes (Wellcome Trust Sanger Institute) ended an excellent session by telling us about a major effort to mutagenise all of the protein-coding genes in the mouse genome using gene trapping. Excitingly, the presence of Flp and Cre recombination sites in the targeting vector allows many genetic tricks after a trapping event, such as reversions and single base substitutions. When the trapping approach has been exhausted, high-throughput gene targeting will be used to complete the project.

Currently, the project has trapped 10% of the genes in the genome and it is projected that almost all the remaining genes will be trapped within three years. Mutagenised genes can be browsed online at http://baygenomics.ucsf.edu/ and are annotated in the Ensembl genome viewer (http://www.ensembl.org/Mus_musculus/). These mutants are available at cost to the research community as ES cells, making the rapid functional analysis of murine genes possible.

The talks given in this session showed that genomic approaches have started to deliver for cell and developmental biologists. The challenge now is the development of methods and resources for rapid functional analysis of the large data sets being generated and it is apparent that the response to this challenge is already well under way.

Stephen. N. Sansom
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Workshop: Organelle proteomics

Protein-protein interactions are key to most biological processes. Identification of the protein composition or 'proteome' of subcellular organelles and structures will be important in future attempts to understand the workings of the cell and the functions of its components.

Recent advances in proteomics technology and the availability of genome databases makes this area an exciting topic for discussion. With this in mind, Mark Marsh and Paul Luzio organized a forum called 'Organelle Proteomics', including a final round table session, to address recent advances and approaches. The participants were cell biologists who have adopted proteomics to explore their systems rather than the mass spectrometerists who have developed the technology.

Conventional approaches based on the isolation of subcellular organelles, and affinity chromotography, have yielded new information about the components of clathrin-coated vesicles (**Margaret Robinson**, University of Cambridge), exosomes (**Clotilde Thery**, Institut Curie, Paris), and spindle pole bodies (**John Kilmartin**, LMB, Cambridge). The major drawback to these approaches is determining whether proteins that appear to be contaminants are the result of imperfect fractionation or relevant components that provide new insight into function. Several speakers underlined the use of multiple techniques to verify the presence and, importantly, the function of unexpected members of specific proteomes.

Etienne Gagnon, representing the DesJardin group in Montreal, discussed the proteome of latex bead phagosomes where 'contaminants' derived from the endoplasmic reticulum were shown, using several approaches including electron microscopy, to be components involved in the formation of this compartment.

Membrane proteins are refractile to most conventional 2D gel analysis owing to their poor resolution in the isoelectric focusing step, low adundance, post-translational modifications and poor solubility in detergents. **Ian Fearnley** (MRC, Cambridge)

Sharon Tooze
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has used a biochemical approach and novel detergent solubilization strategies to identify components of the electron transport machinery in isolated mitochondria.

Kathryn Howell (University of Colorado, USA) reported work done in collaboration with Chris Wu and John Yates at the Scripps Research Institute that focused on identification of membrane proteins in high-throughput analyses, known as multidimensional protein identification technology (MudPIT; *Nat Biotechnol* 2003;21:532-538). Use of high pH carbonate to open membrane vesicles derived from the Golgi complex coupled with protease protection strategies allows identification of most transmembrane proteins and provides information on the orientation (cytoplasmic vs. luminal) of domains within transmembrane proteins. Using this high-throughput approach, Kathryn has identified about 2860 proteins with over 100 of these having post-translational modifications.

Paul Dupree has used 2D difference gel electrophoresis technology, based on post-isolation differential labelling with fluorescent cy3 or cy5 dyes, to characterize proteins in plant cells that may be GPI linked. Paul used phospholipase C sensitivity to identify proteins in plants that resemble components of lipid rafts in mammalian cells.

Angus Lamond (University of Dundee) addressed the proteome of the nucleolus and the problems of studying a proteome when the components are dynamic and continuously changing. Angus has studied this proteome using tandem LC MS-MS; he predicts that up to 800 proteins will be found in the nucleolus. This represents a 10-fold increase since 2001. Importantly, the number of protein families has not increased, but the number of members in each family has expanded.

Angus discussed the use of stable isotope labelling with amino acids in cell culture (SILAC) technology (*Methods* 2003;29:124-130), developed by Matthias Mann (Odense, Denmark) to differentiate two populations of proteins, in his case resident versus transitory proteins of the nucleolus.

How much should you trust your PhD advisor?

This year's Borden lecture was given by Henry Sun, who is Rudolf L. Baer Professor of Dermatology and Professor of Pharmacology and Urology at New York University Medical Center.

"If a man will be content to begin with certainties, he shall end with doubts. But if he will be content to begin with doubts, he shall end with certainties." [Francis Bacon]
Henry Sun lecture

In a highly entertaining talk, Henry Sun threw a lifeline for PhD students. He gave advice on how to handle trust in authority, risk assessment and experimental design whilst also supporting a more direct approach towards the coaching of PhD students. All the examples he gave were illustrated with nice simple stories.

He defined authority as a source of expert information and advice – anything from your advisor through to kit protocols. He explained that too much trust in authority is bad for a research career, since it can lead to a lack of understanding of the basis for the experiment – 'intellectual laziness'. The opposite case, extreme scepticism, is equally undesirable. It is not advisable to allow scepticism to lead to mistrust of reagents or techniques which are well established in the lab. There is no need to continually reinvent the wheel. He went on to discuss how risk assessment should be the basis of experimental design. The more time-consuming your experiment or the more precious the reagents involved, the more diligently you should plan the work. For these expensive experiments, failure should not be an option! Detailed experimental design and good notebooks are necessary for success in research.

Furthermore, he stressed that it is very difficult to teach inexperienced students how to make the most of their PhD time; this is all the more complicated considering different personalities and cultural backgrounds. He emphasised the importance of coaching PhD students, which could make all the difference between frustration and fun in the lab.
Conrad Nieduszynski

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The principle of this method (see figure beside) rests on generating labelled cDNA probes from RNA sample. Probes are then hybridized on arrays in which several cDNA have been spotted. After detecting the presence of hybridized probes on the array (either by radioactive or chemiluminescent methods), the expression profiles of genes on the array can be directly compared between the two samples. Any up-regulation or down-regulation of gene expression as a result of the experimental condition is immediately apparent.

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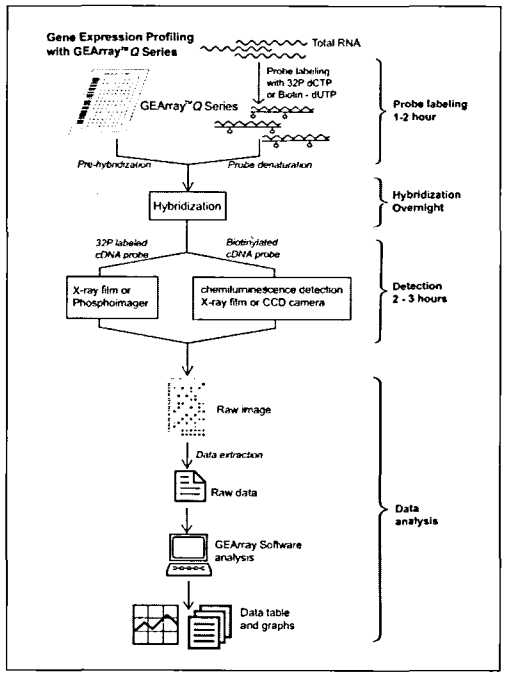

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The ASCB 43rd Annual Meeting

December 13-17, 2003
San Francisco

Suzanne Pfeffer, *President*
Vivek Malhotra, *Program Chair*
Matthew Welch, *Local Arrangements Chair*

Symposia

Sunday, December 14—8:00 am

Cell Biology of Learning
Yukiko Goda, *University College, London*
Eric Kandel, *Columbia University*
Karel Svoboda, *Cold Spring Harbor Laboratory*

Sunday, December 14—10:30 am

Stem Cells
John Gearhart, *The Johns Hopkins Hospital*
Seung Kim, *Stanford University*
Erika Matunis, *Carnegie Institution of Washington*

Monday, December 15—8:00 am

Cell Division
Jeff Errington, *Oxford University*
Kathy Gould, *Vanderbilt University*
Katherine Osteryoung, *Michigan State University*

Monday, December 15—10:30 am

Membrane Traffic
Norma Andrews, *Yale University*
Scott Emr, *University of California, San Diego*
James Rothman, *Memorial Sloan-Kettering Cancer Center*

Tuesday, December 16—8:00 am

Signaling in Cancer
Richard Hynes, *Massachusetts Institute of Technology*
Mark Peifer, *University of North Carolina, Chapel Hill*
Zena Werb, *University of California, San Francisco*

Tuesday, December 16—10:30 am

Light in Cell Biology
David Agard, *University of California, San Francisco*
Wolfgang Baumeister, *Max Planck Institute for Biochemistry*
Scott Fraser, *California Institute of Technology*

Wednesday, December 17—8:00 am

Cell Motility
Frank Gertler, *MIT*
Kozo Kaibuchi, *Nagoya University*
Denise Montell, *The Johns Hopkins University*

Minisymposia

Minisymposia will be scheduled each afternoon, Sunday through Wednesday of the Annual Meeting. Four additional speakers for each minisymposium will be selected by the co-chairs from among abstract submissions. The schedule will be announced in September. See www.ascb.org for more information.

Apoptosis
John Abrams, *University of Texas Southwestern Medical Center*
Junying Yuan, *Harvard Medical School*

Cell Biology of Infectious Diseases
Karen Guillemin, *University of Oregon*
Craig Roy, *Yale University*

Cell Cycle Regulation
James Ferrell, *Stanford University*
Clare McGowan, *The Scripps Research Institute*

Cell Motility
Richard Firtel, *University of California, San Diego*
Alan Hall, *University College, London, UK*

Cell Polarity
Jeff Axelrod, *Stanford University*
Ben Margolis, *University of Michigan*

Cell-Cell Communication
Douglas DeSimone, *University of Virginia*
Albert Reynolds, *Vanderbilt University*

Cell Signaling
Tobias Meyer, *Stanford University*

Chromosome Dynamics
Sue Biggins, *Fred Hutchinson Cancer Research Center*
Abby Dernburg, *Lawrence Berkeley National Laboratory*

Control of Cell Shape/Size
Judith Kimble, *University of Wisconsin*
David Sabatini, *MIT, The Whitehead Institute*

Cytokinesis
Christine Field, *Harvard Medical School*
James Spudich, *Stanford University*

Cytoskeletal Dynamics
Karen Oegema, *University of California, San Diego*
David Pellman, *Dana-Farber Cancer Institute*

Dendritic Cells
Ira Mellman, *Yale University School of Medicine*
Ulrich von Andrian, *Harvard Medical School*

Endocytosis
Crislyn D'Souza-Schorey, *University of Notre Dame*
Sandra Schmid, *The Scripps Research Institute*

ECM and Cancer
Renato Iozzo, *Thomas Jefferson University*
Valerie Weaver, *University of Pennsylvania*

ECM Molecules and Their Receptors
Arthur Lander, *University of California, Irvine*
Linda Sandell, *Washington University*

Integrin Signaling
Carol Otey, *UNC, Chapel Hill*
Thomas Parsons, *University of Virginia*

Lipids in Membrane Dynamics
Vytas Bankaitis, *UNC, Chapel Hill*
Gerrit Van Meer, *Center for Biomembranes & Lipid Enzymology, The Netherlands*

Lipids in Signaling
Jack Dixon, *University of California, San Diego*
Sergio Grinstein, *Hospital for Sick Children, Toronto*

Membrane Cytoskeleton Interactions
Miriam Goodman, *Stanford University*
Min Han, *University of Colorado*

Mitotic Spindle Assembly and Function
Georjana Barnes, *University of California, Berkeley*
Erich Nigg, *Max-Planck Institute of Biochemistry, Germany*

Molecular Motors
Michael Ostap, *University of Pennsylvania*
Jonathan Scholey, *University of California, Davis*

Nuerocytoplasmic Transport
Michael Matunis, *The Johns Hopkins University*
Lucy Pemberton, *University of Virginia*

Neuronal Pathfinding and Disease
Mary Hatten, *The Rockefeller University*
David Van Vactor, *Harvard Medical School*

Organelle Maintenance and Inheritance
Adam Linstedt, *Carnegie Mellon University*
Michael Yaffe, *University of California, San Diego*

Organization of the Nucleoplasm
Joan Politz, *University of Massachusetts*
Robert Singer, *Albert Einstein College of Medicine*

Organogenesis
Mark Krasnow, *Stanford University*
Susan Mango, *University of Utah*

Quality Control and Protein Degradation
Chris Kaiser, *Massachusetts Institute of Technology*
Hidde Ploegh, *Harvard University*

RNA Localization and Degradation
Peter Takizawa, *Yale University*
Karsten Weis, *University of California, Berkeley*

Signaling and Cell Proliferation
Shoukat Dedhar, *Jack Bell Research Center, British Columbia*
Jessica Treisman, *New York University*

Signaling and Development
Philip Beachy, *The Johns Hopkins University*
Mariann Bienz, *Medical Research Council, UK*

Stem Cells
Arturo Alvarez-Buylla, *University of California, San Francisco*
Margaret Fuller, *Stanford University*

Vesicle Trafficking
Charles Barlowe, *Dartmouth Univesity*
Gregory Payne, *University of California, Los Angeles*

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

Autumn Meeting
The Cell Biology of Cancer
BSCB / BACR Meeting
14–17 September 2003, Oxford

Location
St Catherine's College, University of Oxford

On-Line Registration Form
http://www.procon-events.com/cbc03/cbc03reg.htm

Early Booking Registration deadline
1st August 2003

Bursaries
British Society for Cell Biology and British Association for Cancer Research have bursaries available for Student Members to cover a substantial proportion of the meeting costs. Bursaries will be available on a first come first served basis. Please note that you must complete and submit your registration **before** applying for a bursary.

Meetings packages
There are two packages available:
Full Participant for the whole conference period, Day Delegate, excluding accommodation and dinner.

Please note that a late booking fee of £25 per booking will apply after 1st August 2003.

Full Participant
Student Members: £280 (£305 after 1/8/03)
BSCB/BACR Members: £310 (£335 after 1/8/03)
Non-Members: £340 (£365 after 1/8/03)

If you are registering as a full participant, accommodation is included in standard B&B accommodation for Sunday, Monday and Tuesday nights. You can upgrade to an en-suite room for the three nights at a total cost of £49.50 (subject to availability).

Day Delegate
Monday: £65 (£90 after 1/8/03)
Tuesday: £65 (£90 after 1/8/03)
Wednesday: £35 (£60 after 1/8/03)

If you wish to book additional nights accommodation either side of the conference, or you are a day delegate wishing to book accommodation, please state your requirements on the on-line registration form and you will be contacted about availability. Rates are: Standard room £40 per night B&B/ En-Suite £60 per night B&B.

Cancellation
Cancellations will be accepted in writing until 8th August 2003. Until that time a refund of 70% of the registration fee will be made. There will be no refunds for cancellations received after 8th August 2003 .

Society membership
If you wish to join either society in order to qualify for a cheaper "Members" fee, please visit the society web page:
http://www.bscb.org/
http://www.bacr.org.uk/

Programme

Sunday 14 September

14.00 – 18.00	Registration
18.00 – 19.00	Reception
19.00 – 20.30	Buffet Dinner
20.30 – 21.30	Plenary I: Gerard Evan (UCSF) EMBO Lecture
21.30 – 0.00	Cash Bar

Monday 15 September

Session 1

Genomic Instability I: Kinetochores

Chair: Steven Taylor

09.15 – 09.45	Stephen Taylor (Manchester)
09.45 – 10.15	Bill Earnshaw (Edinburgh)
10.15 – 10.45	Peter Sorger (MIT, Boston)
10.45 – 11.10	Coffee
11.10 – 11.30	Short Talk
11.30 – 12.00	Ted Salmon (UNC, USA)
12.00 - 12.30	Andrea Musacchio,
EMBO Young Investigator Lecture.	
12.30 – 12.50	Short Talk
13.00 – 14.00	Lunch

Session 2

Tumour microenvironment influences on cell biology

Chair: Kaye Williams

14.00 – 14.30	Bill Kaelin (Toronto)
14.30 – 15.00	Willy Krek (Zurich) Sponsored by Novartis
15.00 – 15.20	Short Talk
15.20 – 15.45	Tea
15.45 – 16.15	Rachel Airlie (Manchester)
16.15 – 16.45	Claire Lewis (Sheffield)
16.45 – 17.05	Short Talk
17.15 – 19.00	Poster Session I w/ Wine and Beer provided
19.00 – 20.30	Dinner

Tuesday 16 September

Session 3:

Genomic Stability II: APC and Centrosomes

Chair: Inke Nathke

09.15 – 09.45	Inke Nathke (Dundee)	
09.45 – 10.15	Rebecca Heald (Berkeley)	
10.15 – 10.45	Erich Nigg (Munich)	AICR Lecture
10.45 – 11.10	Coffee	
11.10 – 11.30	Short Talk	
11.30 – 12.00	Jordan Raff (Cambridge)	
12.00 - 12.30	Jason Swedlow (Dundee)	
12.30 – 12.50	Short Talk	
13.00 – 14.00	Lunch	

Session 4:

Metastasis

Chair: Ruth Muschel

14.00 – 14.30	Ruth Muschel (Pennsylvania)
14.30 – 15.00	Frans Van Roy (Ghent)
15.00 – 15.20	Short Talk
15.20 – 15.45	Tea
15.45 – 16.15	Sue Eccles (Sutton)
16.15 – 16.45	Rod Smallwood (Sheffield)
16.45 – 17.05	Short Talk
17.15 – 19.00	Poster Session II
19.00 – 20.30	Dinner
20.30 – 21.30	Plenary II: Karen Vousden (Glasgow)
21.30 – 00.00	Social Event in the Bar

Wednesday 17 September

Session 5:

Angiogenesis/endothelial cell proliferation

Chair: Roy Bicknell

09.30 – 10.00	Roy Bicknell (Oxford)
10.00 – 10.30	Elisabetta Dejana (Milan)
10.30 – 10.50	Short Talk
10.50 – 11.15	Coffee
11.15 – 11.45	Jan Kitajewski (Columbia, NY)
11.45 – 12.05	Short Talk
12.05 - 12.35	Ralf Adams (London)
12.35 – 12.45	End of Meeting
12.45 – 14.00	Lunch

Other forthcoming meetings

Stress, Signalling and Control
2–4 July 2003, University of Essex
Biochemical Society
www.biochemistry.org/meetings

Cell Signalling and Cancer
6–9 July 2003, Beatson Institute, Glasgow
t.wheeler@beatson.gla.ac.uk
www.beatson.gla.ac.uk/conf

Receptor mechanisms and signal transduction
15-19 July 2003, University College London and the European Institute of Chemistry and Biology
Dr I Kramer, INSERM U441 - Institut Européen de Chimie et Biologie, France
www.iecb-polytechnique.u-bordeaux.fr
i.kramer@iecb-polytechnique.u-bordeaux.fr

International Congress of Biochemistry and Molecular Biology
20–24 July 3003, Toronto, Canada
www.nrc.ca/confserv/iubmb2003

Society for Developmental Biology Annual Meeting
30 July – 3 August 2003
Boston, USA
http://sdb.bio.purdue.edu

International Gap Junction Intercellular Communication conference
23–28 August 2003, St Johns College, Cambridge
Howard Evans, Dept of Medical Biochemistry, University of Wales College of Medicine, Cardiff
GAPJUNCTION@cf.ac.uk
www.med.ic.ac.uk/divisions/32/gj/index.htm

Sixth International Symposium on Mass Spectrometry in the Health and Life Sciences: Molecular and Cellular Proteomics
24– 28 August 2003, San Francisco, USA
http://donatello.ucsf.edu/symposium

56th Harden Conference - Biological Electron and Proton Transfer
26-30 August 2003, University of Plymouth, UK
Biochemical Society; meetings@biochemistry.org

16th International Mass Spectrometry Conference
31 August – 5 September 2003, Edinburgh
www.imsc-edinburgh2003.com

Cells V
8–10 September 2003, Ceske Budejovice, South Bohemia, Czech Republic
www.entu.cas.cz/cells/cells5.htm

57th Harden Conference - Proteinase Structure and Function
9-13 September 2003, Oriel College, Oxford
Biochemical Society
meetings@biochemistry.org

BSCB/BACR Meeting: Cell Biology of Cancer
14-17 September 2003; see page 31

Ultrastructure in the Era of Proteomics
17–20 September 2003, Les Diablerets, Switzerland
www.sfh.unizh.ch/society_index.shtml

ELSO 2003 (Annual Meeting of the European Life Science Organization)
20 – 24 September 2003, Dresden, Germany
www.elso.org

Annual Meeting of the German Society for Cell Biology
25–27 September 2003, Jena
www.zellbiologie.de

ComBio2003
28 September – 2 October 2003, Victoria, Australia
www.asbmb.org.au/combio2003/index.html

Functional Genomics: from the bench to bioinformatics
25–31 October 2003, San Feliu de Guixols, Spain
www.esf.org/esfjsps

Advanced Data Mining and Visualisation Approaches to Systems Biology
13-15 November 2003, University of Ulster
http://ijsr32.infj.ulst.ac.uk/~e10110731/ESF2003.htm

ASCB 43nd Annual Meeting
13–17 December 2003; see page 30

BSCB Spring 2004 Meeting: Cell Structure and Dynamics
31 March – 3 April 2004, University of Kent at Canterbury. Organizers to be confirmed

BioScience2004: From molecules to organisms
18–22 July 2004, SECC, Glasgow
Biochemical Society Annual Meeting
www.biochemistry.org/meetings

BSCB 2004 Autumn Meeting: Meiosis
Centre for Life, Newcastle upon Tyne
Organizer: Mary Herbert (Newcastle)

Techniques in Molecular Biology
University of Hertfordshire (UK)

Department of Biosciences,
University of Hertfordshire,
College Lane, Hatfield,
Herts AL10 9AB UK.
www.herts.ac.uk/natsci/STC

Molecular Biology: basic terms and techniques
A one-day laboratory/lecture course
27 June 2003

Introduction to DNA and Protein Bioinformatics
A two-day practical/lecture course
1–2 July 2003

RNA Extraction and Analysis
A one-day laboratory/lecture course
3 July 2003

PCR Methods and Applications
A one-day laboratory/lecture course
4 July 2003, Hatfield, Herts UK

Details and application forms for the above courses from:
Dr Ralph Rapley (address as above)
tel: (01707)285097 fax: 286137
e-mail: R.Rapley@herts.ac.uk

Protein Techniques
A two-day laboratory course
1–2 September 2003
Details and application forms from:
Professor John Walker
(address as above)
tel:(01707) 284546 fax:284510
e-mail:J.M.Walker@herts.ac.uk

Nucleic Acid Techniques
A three-day laboratory course
3–5 or 10–12 September 2003
Details and application forms from:
Dr Virginia Bugeja (address as above)
tel: (01707)284590 fax: 286137
e-mail:V.Bugeja@herts.ac.uk

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 younger BSCB members at the beginning of their research careers to attend meetings. Applications are considered for any meeting relevant to cell biology. The amount of the award depends on the location of the meeting. Awards will be up to £300 for UK meetings (except for BSCB Spring Meeting for which the registration and accommodation costs will be made, even in excess of £300), up to £400 for European meetings and up to £500 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 member for at least a year (except for first-year phD students)
- No applicant will receive more than one award per year and three in toto
- The applicant must be contributing a poster or a talk.

Applications should be sent to

Kathryn Ayscough, IBLS, Davidson Building, University of Glasgow, G12 8QQ.

All applications must contain the following:

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

Application for an Honor Fell travel award

Full name and Work address

(write clearly – this will be used as a return label)

.....

.....

.....

.....

.....

E-mail address: .....

Age: .....

BSCB Membership number: .....

The years of previous Honor Fell awards:

.....

Degrees (with dates): .....

.....

Present position: .....

.....

Key publications (2) or research interests:

.....

.....

.....

Number of meetings attended last year:

.....

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

.....

.....

.....

Estimated expenses: Travel: .....

Subsistence: .....

Registration: .....

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 Department:

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.

Signature: .....

Name: .....

Applicant's signature: .....

Name: .....

Application to join the BSCB

Please complete and return along with a signed Direct Debit mandate to:
Margaret Clements, Department of Zoology, Downing Street, Cambridge, CB2 3EJ.

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

Position: ..... Male/Female

Academic qualifications: .....

Email: .....

Telephone: .....

Fax: .....

Address: .....

.....

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

Research interests: .....

.....

Membership of other societies:

.....

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

Applicants without proposers should enclose a brief CV

The society has an searchable database of its members on the BSCB web page; if you wish your details to be included tick here ☐

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

INSTRUCTIONS TO YOUR BANK/BUILDING SOCIETY TO PAY DIRECT DEBITS

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Please complete parts 1, 2, 3, 4 and 6 to instruct your branch to make payments directly from your account. Then return the form to: British Society for Cell Biology, c/o Margaret Clements, Department of Zoology, Downing Street, Cambridge, CB2 3EJ.

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Address

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..... Postcode .....

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5. Originator's reference number (for office use only) BRITSO | | | | |

1. Please write the full postal address of your branch in the box above.

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3. Account number | | | | | | | | |

4. Sort code | | — | | | — | | |

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Signature .....

Date .....

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- You can cancel a Direct Debit at any time, by writing to your Bank or Building Society. Please also send a copy of the letter to the BSCB.

The British Society for Cell Biology
Society business

Minutes of the Annual General Meeting Wednesday 9 April 2003

Apologies
Apologies for absence were received from the following committee members: Michael Whitaker, Bill Earnshaw, Kathryn Ayscough, Steve Winder, Joan Marsh

Minutes of the last AGM
The minutes of the last AGM were approved.

Resignations
It was announced that Inke Näthke, Louise Cramer and Robert Insall had tendered their resignations from the Committee and that Simon Hughes, Steve Winder and Charles Streuli had resigned as Officers. Steve's success in increasing the BSCB membership, Simon's launch of the BSCB website and Charles' vision in developing professional support for our scientific meetings were noted.

Election of new Committee members
Two new Committee members were elected: Stephen Nurrish and Kairbaan Hodivila-Dilke.

Election of new members to the Society
The names of the new members were presented to the meeting and approved for election. The list will be published in the Society's newsletter.

President's Report
There have been several resignations and retirements from the BSCB committee and we would like to thank everyone for all their hard work on behalf of the Society. Steve Winder has been an excellent membership secretary; Simon Hughes has done wonders for our website, and Louise Cramer has been very effective in UKLSC/IoB liaison. We are also very sorry to lose Robert Insall and Inke Näthke. Finally, Charles Streuli has been an outstanding meetings secretary and greatly improved the way that our meetings are organised and run; he retires in 2004 but his successor has already been appointed to ensure a smooth transition.

New committee members elected at the AGM are Kairbaan Hodivala-Dilke, who will be our new meetings secretary, and Stephen Nurrish, who will liaise with the Biosciences Federation, which has taken over from UKLSC. Jonathan Pines is taking over as membership secretary.

The President thanked the organisers of this year's spring meeting, in particular Charles Streuli and Mark Marsh, for making it such a success. She also thanked the session chairs, speakers and poster presenters for their contributions. The total number of delegates was almost 500, well above expectations.

It was announced in 2002 that the BSCB would fund bursaries for final year undergraduates to enable them to attend the spring meeting. The President welcomed the three undergraduates present at this year's meeting.

The President announced changes to the Honor Fell travel awards scheme. The amount available per award is being increased and the one year membership requirement is being waived for first year PhD students.

She also announced that BSCB had taken out trustees' indemnity insurance and that the committee had voted to join the Biosciences Federation.

In closing, the president urged BSCB members to make nominations for the Hooke medal and the BSCB committee, to suggest topics for the spring and autumn meetings and to contribute to the newsletter and website.

Secretary's Report
Trustees (that is BSCB Committee members) must now carry out a risk assessment for the charity and publish annually the major risks the charity faces.

Risk assessment
Charity trustees are now required to publish a risk assessment in their report. We have considered a variety of risks and have identified several risks whose likelihood/impact product is sufficiently large to cause us to consider how to mitigate the risk. These are:

- Meetings fail to take place
- Meetings organization company fails
- Misappropriation of funds

- Illegal actions by trustees
- Liability for meetings organized by non-trustees
- Unauthorized use of databases [BACS, etc]
- Financial arrangements with BSDB: default/mismanagement

We propose to mitigate these risks by taking out appropriate insurance, by implementing the appropriate financial safeguards, by taking appropriate professional advice and by putting our relationship with BSDB on a firmer basis.

Investment policy
We are now also required to state our investment policy to safeguard the Society's assets. In fact, we are not an asset-rich charity; very little of our income arises from a return on capital and we have very few tangible assets. Our annual turnover is comparable to our capital base. The Trustees' policy is to invest in low-risk and reasonably liquid assets, so that funds are readily available to meet any unforeseen needs that arise as a consequence of meetings activities.

Treasurer's Report
The final accounts for the year 2001 were presented to the meeting and accepted. These accounts were published in the 2002 BSCB Newsletter for summer 2002, together with the Treasurer's report, and are available from the BSCB web site (www.BSCB.org).

The accounts for 2002 were presented to the meeting in preliminary form. In 2002 the BSCB ran three meetings. The joint BSCB/BSDB Spring meeting at York, the meeting to honour Martin Raff which had been postponed from the previous September and the Abercrombie meeting in Oxford.

One consequence of running three meeting is that the total amount of money passing through the society's accounts in 2002 exceeded £250,000. The society is now required to have its accounts fully audited to comply with the financial regulations governing charities. The accounts for 2002 have been compiled by David Cooke and Co, Chartered Accountants, Botley, Oxford and are currently being audited.

The final audited 2002 accounts will be published in the next BSCB Newsletter, together with the Treasurer's report, and will be presented to the next BSCB AGM to be held in Canterbury at the 2004 Spring meeting.

Based on the unaudited figures compiled by Mr. Cooke, the BSCB is in a healthy financial position with a modest increase in our reserves over 2001.

Any Other Business
There was no other business.

New members from April 2002

Ahir, Dr. Alpa
Aksan, Dr. Isil
Al-Dahmash, Abdullah
Andrew, Natalie
Aresta, Dr. Sandra
Austin, Dr. C.A.
Aw, Dr. Andrew K.L.
Babaie, Yasmin
Baxter, Joanne
Bildsoe, Heidi
Brack, Dr. Andrew
Brandie, Fiona M.
Broderick, Michael
Byland, Rahel
Cao, Zhenbo
Cau, Dr. Julien
Chou, Hsiu-Chaun
Choudhury, Dr. T.
Clark, Martin
Clotworthy, Margaret
Constable, John R.L.
Coulton, Dr. Gary R.
Craig, Tim J.
Crookes, Renarta
Dahlmann, Dr. Annegret
Dammerman, Alexander
Darcy, Kevin
Dash, Satya
de Bettignies, Augustin
Deinhardt, Katrin
Dolman, Nick
Driskell, Owen
Eastwood, Dr. Helen
Emde, Dr. Natacha
Evans, Iwan R.
Fletcher, Georgina
Floyd, Rachel
Franc, Dr. Nathalie C.
Francis, Richard
Gardiner, Fiona
Goldberg, Dr. Martin W.
Gould, Prof. G.W.
Granata, Alessandra
Guillot, Dr. Pascale V.
Hadfield, Kristen
Hammond, Christina
Harris, Dr. James
Heasman, Sarah
Higginson, Jennifer
Hiley, Emma
Hill, Gemma
Hinits, Dr. Yaniv
Hobbs, Emma L.
Hooper, Joel
Hosking, Rosy
Hunter, Alison
Ibarra, Neysi
Ioannidou, Sofia
Jackson, Ben
Janes, Mandy E.
Johnson, Laura
Kimber, Sandra J.
Kotzer, Amanda
Legg, John
Leplar, Chloe
Liu, Dong
Lockyer, Peter J.
Logan, Dr. David C.
Mackley, Jennifer R.
Mansfield, Louise
Marlow, Rebecca
Mayho, Matthew
McFarlane, Dr. Ramsay J.
Merrick, Catherine
Monypenny, James
Nair, Priyalakshmi
O'Hare, Dr. Peter
Oldershaw, Rachel
Olofsson, Dr. Birgitta
Orth, James D.
Osborn, Daniel
Peter, Marion
Pillai, Meenu R.
Platt, Christopher
Prasad, Shyam
Proctor, Kirsty M.
Qiu, Dr. Jin
Redd, Dr. Michael J.
Rogers, Helen
Ropero, Dr. Ana B.
Sarafimidis, Ioannis
Schatzmann, Franziska
Screen, Dr. Hazel
Seager, William H.
Simeonidis, Iordanis
Slack, Sarah
Smolle, Michaela
Stern, Irit
Storr, Dr. Helen
Sun, Shun-Kuo
Swanton, Dr. E.
Tacon, Daryl
Thornton, Gemma
Turner, Frances
Tzircotis, George
Wallace, Derek A.
Wang, Bo
Ward, Katherine
Warde, David
Wilson, Heather
Worth, Daniel C.
Xu, Danmei

British Society for Cell Biology
Committee Members 2003

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Appointed 2001; retires 2007

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Appointed 2000; retires 2006

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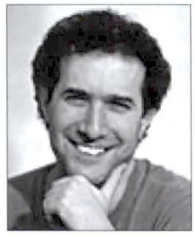

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The BSCB newsletter is published twice a year in June and December.

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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.

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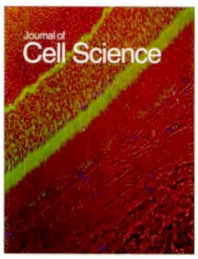

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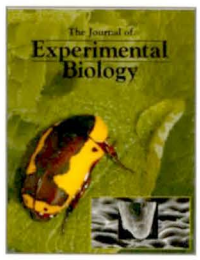

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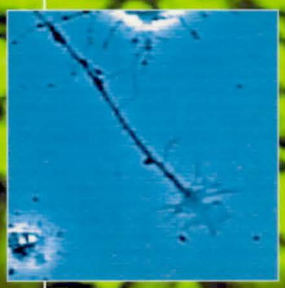

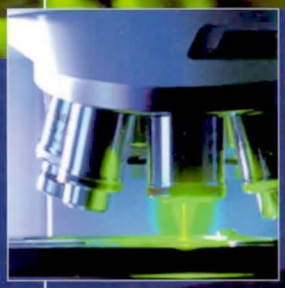

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