BSDB Newsletter

Winter 2002
Vol. 23, No. 2

British Society for Developmental Biology

Development

Spring Meeting 2003

BSDB Newsletter

Winter 2002 Volume 23, Number 2

Editorial

As befitting our troubled world at present, bioscience also is facing some serious issues. Immediately worrying for many of us is the thorny issue of funding, particularly as the MRC shakes out its accounting problems (p4), and the Trust and the BBSRC take on the resulting spillover (not to mention that the Trust's assets shrank by one third as the world's stock markets crashed).

Funding, even at the best of times, is dependent not only on what you publish, but also *where* that work is published. Thankfully Development, with **Jim Smith** newly at the helm (p2), looks set to remain a prime location for developmental biologists, although, as Jim says, your continued support is vital. In turn, what you publish, and indeed the grant money you earn, knocks-on to the reputation of your institution in the form of its ranking in the Research Assessment Exercise (RAE), which again affects how much money comes in. Is this process fair? How do you voice your opinion if you think it isn't?

Why am I asking these questions? Do they have anything to do with the function of the BSDB? In fact, this is exactly why I am asking. We (the BSDB Committee) are constantly being asked to express opinions about science policy and process, presumably in the belief that we represent the opinion of our membership. And it is a matter of fact that we *do* indeed go ahead and express opinions on various issues of this nature (recent examples being the ERC, the disbanding of the UKLSC (p3), the nature of the RAE and so on). Surprisingly, however, the constitution of the Society does not specifically indicate this to be one of its functions.

We would very much like to know from you, *whether* the Committee should represent members' views to policy makers and, if so, then *how* should this be done.

If you have opinion on this then please bring it along to the **AGM** at the **Spring Meeting**, or write with your views to the Newsletter. We really need your input on this.

One last thing. Does anybody still use the subscription discounts offered to members? Keeping track of which journal is offering what discount is quite a task, which is clearly worthwhile if a lot of people benefit. My suspicion however, fed by feedback from the journals, is that very few people take up these offers, particular with the advent of online publishing. Let me know.

More Newsletter contributions please. Send to me, Andy Furley, at a.j.furley@sheffield.ac.uk

The Editor

Contents

Editorial & Contents 1
From the Chairman 2
Beddington Medal 2
Letter from the Editor of Development 2
News (& Views) 3
Committee changes
Spring Meeting
UKLSC to disband
Amphioxus genome project
UKLSC lifesciences teachers database
MRC Scrutiny Session at Westminster
From the Treasurer 5
Travel Grants
Student Representative 5
BSDB Spring Meeting 6 - 7
Meeting Reports 8 - 11
T boxes
Martin Raff
Women in Science
Future BSDB Meetings 11
Other Related Meetings & Courses 12
Book Reviews 13 - 18
Book & Journal Offers 19
Forms 20
BSDB Membership Application
Travel Grant Application
Address Update
BSDB Committee Members 23
Advertising rates 24

BSDB Spring Meeting 2003

Development

Warwick, 8th – 11th April

See pages 6 & 7 for details of registration and abstract submission

Registration and Abstract Deadline

31st January, 2003

Cover Legend: Facets of Development. Images designed by Paul Scotting

Volume numbers: Some of you will have noticed that this issue has a volume number. This means that if you write something for us, you can quote it elsewhere! How does it work? Each year is a volume and each volume has two issues (Summer and Winter), so you can probably work out the back numbers too.

From the Chairman

The award of this year's Nobel Prize for Physiology and Medicine to **Sydney Brenner**, **John Sulston** and **Bob Horvitz** (who, though American, worked with the former at the MRC Laboratory of Molecular Biology in Cambridge in the mid 1970s) is a cause for great celebration for UK science. It also provides further confirmation – if it was needed – of the pre-eminent position that developmental biology has occupied in the life sciences for the past 25 years. Ironically, as with many other British "discoveries", the genetic analysis of worm development pioneered in Cambridge by these three laureates, has for many years been an almost exclusive preserve of US science (with the notable exception in this country of Jonathan Hodgkin); so it seems fitting that this years' award comes at a time of resurgent activity in worm biology in this country.

The Nobel announcement was made one day before a House of Commons reception organised to celebrate the achievements of last year's UK winners, **Tim Hunt** and **Paul Nurse**. This event, to which the BSDB contributed and at which the Society was represented by myself and the other officers, was billed as an opportunity to showcase UK life sciences to the great and the good at the heart of national government. It was therefore something of a disappointment when only two politicians could be spotted amongst a sea of familiar faces crammed onto the terrace alongside the Thames. Apparently the real place to be that night was not the House of Commons at all, but 10 Downing Street where all the movers and shakers were schmoozing with **Sven Goran Erikson** at a reception hosted by our beloved leader. As I observed in the last issue, it seems that science comes a poor second to football in this nation's priorities. (*same as Liverpool then, eh? Ed).*

The imminent launch of the EU Sixth Framework has stimulated renewed debate about the future funding of science in Europe. A number of influential voices have called for the establishment of a European Research Council, a move that some see as highly desirable and which many see as an inevitable consequence of increased European integration, and indeed the project is now to be considered by EU Ministers (see report of recent meeting on the topic in Copenhagen: http://www.forsk.dk/eng/eupresidency/index.htm).

As with many European issues, enthusiasm for such an ERC appears rather more muted on this side of the channel, perhaps reflecting the relatively healthy funding environment that we still enjoy compared to that of our continental neighbours. This sceptical position has been advanced on our behalf by the UK Life Sciences Committee, an umbrella organisation that represents the views of affiliated Societies to central government (see http://www.lifesci.org/responses/ERCconsult.htm). This may of course, not necessarily reflect the views held by individual members – we would certainly be interested in hearing your opinion on this important topic.

Phil Ingham

Beddington Medal

The death last year of **Rosa Beddington** robbed the developmental biology community of one of its greatest talents and inspirational leaders. Rosa made an enormous contribution to the field in general and to the society in particular so it seemed entirely appropriate that the society should establish a lasting memorial to her. Prizes are an effective and important way of recognising outstanding scientific achievement at any stage of an individual's career. The BSDB Poster Prize – awarded each year at the Spring Symposium – has rightly become highly coveted, as much for the honour that it confers on the winner as for the free trip to the US developmental biology meeting that she or he receives. Nevertheless, the committee felt that a new award – recognising outstanding achievement by a PhD student throughout the course of his/her research project – would be a fitting way of remembering Rosa each year. The first Beddington Medal will therefore be struck and awarded in 2004, nominations for which should be made before September 2003. Details of the nomination procedure are given below and will be posted on the website (www.bsdb.org) in due course.

Phil Ingham

Nomination Procedure

Nomination should be for a thesis submitted in the 12 months preceding 1st September, 2003. Each nomination should include a one page letter from the thesis supervisor, a two page summary outliining the background and findings of the thesis and documentation verifying the date of submission. Nominations should be sent to the BSDB Secretary (**Ivor Mason**, contact details in back pages of this issue).

From the New Editor of Development

At the beginning of 2003, I am taking over from **Chris Wylie** as Editor-in-chief of Development. Older readers of this Newsletter will recall that this is not the first time I have replaced Chris: I took over from him as BSDB Publications Secretary in 1986, the year he started Development. (Those were the days; I designed the newsletter using a programme called PageMaker, which must have cost the Society about £1000, and we bought a Macintosh SE on which to do the work. 1 MB of RAM, 20 MB Hard Disk and it cost over £3000. That's MB, not GB, and those are 1986 prices) *(is the Committee listening? Ed.).*

But with all due respect to this Newsletter and its excellent Editor, my present task is more daunting than that of 16 years ago. Chris 'invented' Development, by taking its predecessor, the Journal of Experimental Embryology and Morphology, by the scruff of the neck and dragging it into the late 20th century. As I outline in my first Editorial (Development 130, 1), Chris made Development the pre-eminent journal in its field, and my

job is to keep it there, the appearance of rival journals notwithstanding.

I hope to achieve this by continuing to publish excellent papers, by increasing the number of review articles, and by having a little more material at the 'front end'. I also hope to broaden the scope of the journal. In these efforts I shall be assisted by the other Editors (including new Deputy Editor-in-chief **Ruth Lehmann**), by the Editorial Board and by **Jane Alfred**, who joins Development from Nature Reviews Genetics. But we also need help from BSDB members, who have a link to Development through the support provided to the Society by the Company of Biologists.

This help can be provided in two ways. First, and most obviously, by sending your best papers to Development. But in addition I, and indeed any of the editors, will always be delighted to hear your comments about the journal and suggestions as to how it might be improved. Do take this invitation seriously; the link between the COB and the BSDB really does mean that Development is 'your' journal. And lest you forget, let me remind you that Development is not like other journals: the COB is a not-for-profit company, so that the proceeds are ploughed back into Biology. At one level these include free reprints, free colour pictures, no page charges and payment to referees. But in addition the COB supports many important projects and initiatives in Biology. These include the Travelling Fellowships, the BSDB and the BSCB, a variety of international meetings, and support for new initiatives that might not be eligible for funding from more 'conventional' sources. Support Development and support Biology!

Jim Smith

News (& Views)

BSDB Committee changes

The upcoming departure of **Jamie Davies** as Meetings Secretary (Jamie, eulogies *will* follow at a later date), the Committee is pleased to announce that **Nancy Papalopulu** will take over this post as of September 2003. Nancy will shadow Jamie in the interim, but please continue direct meeting inquiries to Jamie.

Spring Meeting

This years Spring meeting is being held at **Warwick University from April 8-11th**. Once again this is a joint meeting with the BSCB. However, in response to popular demand at a recent AGM, this year's meeting is the first of the new format Spring meetings which aim to cover all areas of development. We hope this will encourage attendance from all members of the society. To this end, the five themed sessions, (**Induction, Cell Fate and Differentiation, Organogenesis, Genomic Reprogramming and Disease**) span the spectrum of developmental problems, tissues and organisms (full programmes on pages 6 & 7). Members are strongly encouraged to submit an abstract for one of the themed sessions or the general poster session. As many as ten talks will be selected from the BSDB abstracts; all categories of researcher will be eligible.

We hope that all members of the society will find this meeting of interest, particularly given the very complementary nature of the concurrent BSCB sessions. We have worked very hard to keep costs down such that, despite rising costs, this years meeting remains at the price of last year's.

We also welcome suggestions for themes (and chairs) for sessions at future meetings. Please send suggestions to the Meetings Secretary.

New Editor-in-Chief for Development

As of January 1st, **Jim Smith** takes over as the Editor of our favourite journal, Development. (see above)

Amphioxus sequence?

Jeremy Gibson-Brown and **Linda Holland** recently submitted a proposal to the US National Human Genome Research Institute (NHGRI; www.genome.gov) that the Amphioxus genome be sequenced. Anyone interested in this project should check out the details on Jeremy's website: http://tbx.wustl.edu/~jgblab/pub.html or contact him by e-mail: gibbro@wustl.edu.

UKLSC to disband

We recently received the news that the UK Life Sciences Committee (see previous News items from **Paul Martin**) is to disband, to be replaced by the Biosciences Federation. **Guy Tear**, our new representative on the UKLSC, outlines the reasons for the changes:

We joined the UKLSC several years ago after being approached by the then Chair **Martin Raff**. The UKLSC was formed in 1997 when it was clear there was no organization that effectively represented molecular, cellular and physiological life sciences in public affairs. The UKLSC co-ordinates the opinions of its 18 member societies to provide a unified voice to Government and other policy makers. We get monthly reports from the UKLSC describing its activities (copies of which I can forward to those interested). The UKLSC has responded to all major consultations on science policy and funding and provides information to MPs including members of the Commons Science and Technology Committee. The UKLSC is also active in promoting life sciences in undergraduate and postgraduate education, where it makes representations to the Research Councils and the OST, and organizes life science career conferences. Through our membership of the UKLSC we have been representing our members in these areas (but see Editorial, Ed.). The UKLSC has been very successful in relaying the interests of life sciences and has rapidly become a major contributor that is routinely consulted. I believe the UKLSC represents good value for our investment (~£1200 per annum, which includes a contribution to the Animal Science Group which represents interests of members using animals in research, Ed.) and allows us some say in UK policy on behalf of our members.

Despite the success of the UKLSC it is considered that the biosciences still suffer in comparison to chemistry and physics which have a single body to which Government etc approach for advice. Thus the UKLSC have decided to combine its activities with that of the **Institute of Biology** and the **UK National Committee for Microbiology** to form a coherent body representing life sciences. This body, the **Biosciences Federation**, will have the ability to represent all life sciences in public debates, education, lobbying and funding considerations. The aims and objectives of the Federation are set out in a model paper available from BSDB Secretary.

The Federation hopes to be a true single organisation not an umbrella of umbrella organizations. It is hoped that the Federation will be even more successful in getting the attention of Government and promoting the interests of UK life scientists.

At the time of going to press the UKLSC has ratified the decision to disband at the launch of the Biosciences Federation, the date of which has yet to be confirmed.

The UK Life Sciences Speakers Database "Bringing Lifesciences to Our Schools"

(http://www.biology4all.com)

This database has been developed by the UK Life Sciences Committee to provide a central resource for schools looking for speakers from HE establishments. Launched at the BA Festival of Science, University of Leicester on 12th September, the database already holds details of over 350 University Academics and Researchers who work in the Life Sciences, and are willing to visit local schools/colleges to give talks on their subject specialisms.

All Academics and Researchers in UK Universities (and similar establishments) are most welcome to join the database. To register simply send your name, email address and postcode to pkrobinson@biology4all.com. You will then be registered and emailed a password, which will subsequently enable you to add further personal details and details of your talk(s) for yourself. For example, you decide for yourself how far you wish to travel to give talks. The default distance is "up to 30 miles", but some speakers have opted only to make visits up to 10 miles whilst others are prepared to travel anywhere within the UK. You will also be able to state whether or not you require any reimbursement for travel costs, etc.

Have a look at the database - it can be found via http://www.biology4all.com - and note that in registering yourself on this database you are not making any firm commitment to give talks "on demand". It is recognised that speaker's other commitments might make it impossible for them to give talks at certain times during the year.

MRC - Scrutiny Session – Dec 4th

The House of Commons Science and Technology Committee will be taking evidence from the Medical Research Council (MRC) on Wednesday 4 December at 4.30 pm. This will be a scrutiny session on the MRC's work and expenditure plans, as part of the Committee's ongoing programme of scrutiny of the Research Councils.

If (by some miracle) this gets to you before Dec 4th, some of you may be interested to go along to the hearing will be held in public in a committee room at the House of Commons.

Among other topics, the Committee will address the issue of the Biobank and the UK stem cell bank, and the impact of the funding of these projects on the funding of other research in the UK.

The committee is chaired by Dr Ian Gibson (right), erstwhile organiser of the BSDB Spring Meeting (1993), who is now MP for Norwich North.

News, Letters and Comments to the Editor
a.j.furley@sheffield.ac.uk

The Royal Institution of Great Britain

The Royal Institution/L'Oreal Science Graduate of the Year Award 2003

The L'Oréal/Royal Institution Science Graduate of the Year Award is open to young researchers in British and Irish universities who have not yet submitted their doctoral thesis. The Award is intended to recognise research of a groundbreaking nature which shows some originality and the will to innovate.

Applications are invited from students working in the life sciences, chemistry, plant sciences and medicine.

The successful candidate will receive £6000 plus life membership of the Royal Institution.

To apply, candidates should submit a one-page summary of their research, indicating the way in which it is ground-breaking, together with a CV and a report from their supervisor. There is no application form to complete.

When making your application, bear in mind that the judges will select candidates based on the following criteria:

1) Originality, i.e. the creative and intellectual input that applicants make to the project
2) Quality, i.e. the work must be of a proven, internationally competitive quality
3) Relevance, i.e. the scientific basis of the project must be of general relevance to broad scientific or technological themes.

Applications should be sent to:
Head of Programmes
The Royal Institution
21 Albemarle Street
London, W1S 4BS
e-mail to jstapley@ri.ac.uk.

The closing date will be Friday 7 March 2003.

STOP PRESS

Royal Society Discussion Meeting

Epigenesis versus Preformation during Mammalian Development

Organised by **Richard Gardner**, **Davor Solter** & **Azim Surani**

February 19-20, 2003 at the Royal Society, 6-9

Carlton House Terrace, London SW1 5AG

Speakers include: **Siegfried Roth**, **Janet Rossant, Liz Robertson, Sarah Crittenden, Andrew Johnson, Brigid Hogan, John Gurdon, Barbara Knowles, Philippe Collas, Austin Smith, Wolf Reik, Tim Bestor, Jeannie Lee, Davor Solter, Richard Gardner** and **Azim Surani**

For further details and registration please email

discussion.meetings@royalsoc.ac.uk

www.royalsoc.ac.uk

From the Treasurer

Travel Grants

Thanks to the continued generous support of the Company of Biologists, the BSDB awards three types of travel grant to members, with preference given to graduate students and postdocs.

BSDB Spring and Autumn meetings:

These are the only UK meetings for which there is BSDB support, and grants cover basic travel and conference expenses (but not conference dinners!). We are currently able to fund demand but, if numbers increase, preference will be given to members who present posters.

BSDB members based abroad are eligible for a contribution (max £400) towards attending BSDB meetings.

Practical courses: Support of up to £500 is available for these courses and, at the moment, all applicants are funded. If more than about 8 members a year apply, however, a selection procedure will be introduced.

Foreign meetings: This is the category for which there is greatest demand and we cannot fund everyone. BSDB will give members a contribution (max £400). Current policy is as follows: no more than two people from one Department or one person from a group will be awarded a grant to go to a particular meeting. Preference will be given to members presenting work.

Other activities: The Treasurer now has a small additional fund to support other activities eg. travel within the UK, or the USA, in order to visit laboratories. Please email the Treasurer with any appropriate request.

Small Meetings

Members may approach the Treasurer for seed funding to help with organising developmental biology events (eg one-day meetings) that involve other institutions and at which students and postdocs are encouraged to attend and present work. The BSDB currently supports the meetings of several local developmental biology groups with small (~£250) annual contributions. Any further requests for this type of funding should be made in a letter to the Treasurer.

Louie Hamilton Fund

There is a small amount of money available from the Louie Hamilton Fund to provide travel support for handicapped members. Applicants should contact the Treasurer.

TO APPLY FOR A TRAVEL GRANT:

- Members should first complete the Travel Grant Application form and send it to the Treasurer. (see **Forms** section at the back of this issue or see the BSDB website: www.bsdb.org)
- Application 3-4 months in advance is advised so that the BSDB contribution can be used as a lever to prise the rest of the money from other sources. No grants will awarded in arrears
- **All applications for grants to attend a BSDB meeting must be in the Treasurer's hands a week before the meeting deadline.**

Please note: no-one will be awarded more than one travel grant for an overseas trip per year.

Financial Report see Spring issue

SUBSCRIPTIONS

1999 "Student-rate" members should quickly upgrade their subscription to **£20 or they will be culled (humanely).

Ottoline Leyser

Graduate Students

Calling all student members of the BSDB…this is your space to fill!

Blank Space

Welcome to the future page (*well, it can be a whole page if there's something with which to fill it, Ed.*) of the regular student input to the bi-annual BSDB newsletter.

- It's going to provide the student membership with a chance to read and contribute to articles about issues that are important to you, from just starting out in post-grad life to the final frontier of "writing-up" your thesis, plus all the fun bits in between!
- If you would like to contribute to or to see any specific issues tackled in this page or you have any questions or ideas regarding student involvement and membership in the BSDB, then email me, **Leigh Wilson**, at: Leigh.Wilson@kcl.ac.uk

I'm looking forward to hearing from you!

Next BSDB Meeting

BSDB/BSCB Spring Meeting 2003
Cell & Developmental Biology
Annual Symposium
University of Warwick, 8th-11th April

BSDB Scientific Organizers: **Robert Kelsh & Paul Scotting**

The title of this meeting reflects a new format, decided by a clear majority at a recent BSDB Annual General Meeting. Instead of devoting the entire meeting to one theme, as has been the practice in recent years, the Annual Symposium will consist instead of a number of half-day themes. We hope that this will encourage a broader range of researchers to attend, and that it will facilitate the exchange of ideas between fields. Each BSDB session has been organized by its own Chair (underlined), who will begin the session by giving an introduction to the topic. *Please note* that there will be as many as 10 poster abstracts selected to be presented as short talks, so we would like to encourage all members to participate by contributing to the general poster session. Full details of the programme and registration are on the BSDB and BSCB websites.

Tuesday 8th April 2003 - Registration

www.BSDB.org or www.bscb.org

Wednesday 9th April

BSDB Session

Induction

- **Judith Kimble**, University of Wisconsin, USA
  Induction of germline stem cells in C. Elegans
- **Liz Robertson**, Harvard University, USA
  To be advised
- **Konrad Basler**, University of Zurich, Switzerland
  To be advised
- **Caroline Dean**, John Innes Centre, UK
  Molecular basis for the cold-induced acceleration of flowering
- **Alex Schier**, New York University, USA
  Nodal signalling: From morphogens to morphogenesis

Cell fate and differentiation

- **Ryoichiro Kageyama**, Kyoto University, Japan
  Regulation of cell differentiation by the bHLH oscillator Hes1
- **Cynthia Kenyon**, UC San Franciso, USA
  Genes and cells that regulate the aging of C. elegans
- **Jeff Williams**, University of Dundee, UK
  The origins of SH2 domain:phosphotyrosine signalling: multiple STAT signalling pathways that regulate the growth and development of Dictyostelium
- **Roger Patient**, University of Nottingham, UK
  Origins and programming of blood and the cardiovascular system in Xenopus and zebrafish
- **Andrew Jarman**, University of Edinburgh, UK
  Control of cell fate determination in the developing Drosophila peripheral nervous system

BSCB Session

Signalling and growth control

- **Giulio Superti-Furga**, Heidelberg, Germany
  Towards a proteomic charting of biological processes
- **Garret Hampton**, San Diego, USA
  Genomic analysis of molecular pathway defects in ovarian carcinomas
- **Hartmut Beug**, Vienna, Austria
  Integration of receptor serine and tyrosine kinase signals in epithelial plasticity and metastasis
- **Julian Downward**, London, UK
  The use of transcriptional profiling to uncover novel signaling mechanisms acting downstream

Cytoskeleton & cell division

- **Buzz Baum**, University College London, UK
  From genotype to phenotype – using information to generate form
- **Ahna Skop**, UC Berkeley, USA
  How do cells divide? : Using proteomics and genomics to study cytokines
- **Aaron Straight**, Boston, USA
  Small molecule approaches to the study of mitosis
- **Julie Ahringer**, Wellcome/CRUK, Cambridge, UK
  Using genome wide RNAi screening to study cell polarity in C.elegans

BSCB Hooke Medal Lecture

N.B. BSCB programme also includes parallel workshops that are not listed. See www.BSCB.org for details

Thursday 10th April

Plenary Session

(Chair: Fiona Watt)

Lord Sainsbury of Turville, UK Government Minister for Science and Innovation

"Government support for world class bioscience in the UK"

Next BSDB Meeting

Thursday 10th April *cont'd*

BSDB Session

Organogenesis

- **Jonathan Slack**, University of Bath, UK
  Organogenesis and the stability of organ identity
- **Drusilla Roberts**, MGH, Boston, USA
  Roles of the Bmp signalling pathway in gut endoderm, mesoderm and neural development
- **Benny Shilo**, Weizman Institute of Science, Israel
  Regulation of epithelial polarity by the Drosphila VEGF/PDGF receptor
- **Ken Zaret**, Fox Chase CC, Philadelphia, USA
  Patterning the liver and pancreas in the endoderm
- **Gerald Cunha**, UC San Francisco, USA
  Title to be advised

Genomic reprogramming

- **Azim Surani**, University of Cambridge, UK
  Epigenetic reprogramming and control of genome functions
- **John Gurdon**, University of Cambridge, UK
  Nuclear reprogramming in Xenopus
- **Rod Scott**, University of Bath, UK
  The epigenetic basis of gametic gender in mammals and flowering plants
- **Helen Blau**, Stanford University, USA
  Adult bone marrow derived 'stem' cells: Repair of brain and brawn
- **Austin Smith**, University of Edinburgh, UK
  Pluripotency and lineage restriction of ES cells

BSDB Waddington Medal Lecture

Followed by **BSDB AGM**

BSCB Session

Special Plenary Session – Borden Lecture

Henry Sun, New York, USA
"Why you shouldn't trust your PhD supervisor"

Transcription & Replication

- **Paul Harkin,** Queen's University of Belfast, UK
  Uncovering BRCA1 regulated signaling pathways by microarray-based expression profiling
- **Peggy Farnham,** Madison, USA
  Genomic approaches toward the identification of target genes of human transcription factors
- **Oscar Aparicio,** Los Angeles, USA
  Mapping and characterization of replication origins throughout the Saccharomyces cerevisiae genome
- **Julian Blow,** University of Dundee, UK
  Proteomic identification of cell cycle-regulated chromosome proteins

Cell adhesion & extracellular matrix

- **Chris Buckley,** Birmingham, UK
  Not all fibroblasts are the same: Selective gene expression using microarrays
- **Hans Clevers,** Utrecht, The Netherlands
  Wnt signaling and colon cancer
- **Victor Koteliansky,** Biogen Inc, Cambridge, USA
  Regulation of gene expression by extracellular matrix
- **Paul Crocker,** School of Life Sciences, Dundee, UK
  Sialic acid binding lectins (siglecs) in the innate immune system

Conference dinner and Ceilidh in Panorama Suite

Friday 11th April

BSDB Session

Disease

- **Nick Hastie**, WGH, Edinburgh, UK
  The Wilms' tumour suppressor, WTI – a multifunctional regulator of genitourinary development
- **Peter Currie**, Sydney, Australia
  Genetic control of muscle cell specification and maintenance within the zebrafish embryo
- **Andrew Wilkie**, John Radcliffe, Oxford, UK
  Apert syndrome: A tale of two nucleotides
- **Riccardo Fodde**, Leiden, The Netherlands
  Colorectal cancer – it takes two to tango.
- **Helena Edlund**, Umeå University, Sweden
  Factors controlling pancreatic beta cell differentiation and function

BSCB Session

Development *(sic)* and tissue assembly

- **Marc Vidal**, Boston, USA
  Mapping the C.elegans proteome
- **Steve Kay**, Scripps, San Diego, USA
  Genetics and genomics approaches to understanding circadian clocks
- **Andrea Brand**, Cambridge, UK
  Genomics approaches to Drosophila neurogenesis
- **Rick Livesey**, Cambridge, UK
  Studying forebrain development with single cell expression profiling

Registration and Abstract Submission

Deadline for early registration and abstract submission: 31st January, 2003
Online registration via www.bsdb.org

For further information contact:
Vicky Milner: 01423 564488

Costs:

Full residential £280 before deadline (£305 thereafter), plus £20 for conference dinner and Ceilidh.
Non-residential is £150 (£175 after Jan 31st) plus £30 for dinner and Ceilidh.

BSDB Autumn Meeting: T-box Genes in Development and Disease

Nottingham University, Sept 16-18.

This autumn's BSDB meeting was designed to bring together different aspects of research on the T-box genes. Talks covered topics such as evolution, structure, function and disease models, which brought together different angles for discussion and enlightenment!

The T-box gene family, so called after the first to be identified, the T gene or Brachyury, encode developmentally regulated transcription factors. The family is characterised by a region of homology of around 180-200 amino acids, a DNA binding domain called the T-box. The T-box domain is conserved from C. elegans to humans and mutations in the T-box genes have been associated with developmental defects in all animal species.

Evolution of the T-box genes

In the attempt to understand the origins of T-box gene function in vertebrates, work was undertaken to clone all the T-box genes of the amphioxus, a primitive chordate, that is the closest living invertebrate relative of the vertebrates. It was found that there was roughly one amphioxus T-box gene for every T-box subfamily of vertebrates (Genetics 2000 156: 1249-1257). The T-box family then expanded through duplication in the vertebrate lineage.

Most amphioxus genes are orthologous to two or three vertebrate genes. The ancestor of the vertebrate eomes/tbr/tbx21 subfamily was a single gene that had been duplicated to give rise to three genes in vertebrates. The original gene was thought to be involved in anteriorisation of the neural domain. Together the members of the Tbx21 subfamily are expressed in the telencephalon of the mouse. They have overlapping, but specific sites of expression. However, in amphioxus the anterior neural domain has now been lost. Mapping the loss and gain of expression domains onto the phylogenetic species tree allowed **Jeremy Gibson-Brown** (Washington University, USA) to map the inferred character states for the evolution of developmental functions by this subfamily.

Comparative analysis has also led to the understanding of vertebrate innovations, for example, in the study of the Tbx1/Tbx10 subfamily. On examination of the Tbx1/ Tbx 10 subfamily it appears that although amphioxus lacks neural crest and sclerotome, the expression pattern of the Tbx1 gene in amphioxus is in a segmental pattern, which, it was theorised, was later utilised in vertebrates, where it could have evolved migratory properties.

Structural insight into DNA recognition by T-box transcription factors

Christoph Müller (EMBL, France) gave us insight into the structure of the T- box domain. The T-box transcription factors appear to be different to other transcription factors in the way they form complexes with the DNA. The T-box transcription factors complex to a T-site, a 24-meric palindromic DNA duplex, as a dimer. The interaction occurs in the major and minor groove of the DNA. But unlike most other minor- groove bound protein-DNA complexes, the hydrophobic contacts do not cause an overall bend in the DNA. The binding of each T monomer to one strand in the inner region and to the opposite strand in the outer region of each half site could prevent DNA bending (Nature 1997: 389, 884-888).

Xbra binds as a dimer to the T-domain, stabilised through hydrophobic interactions, whereas TBX3 binds as two independent monomers to the palindromic T-site. The dimer forms a large arc that spans the DNA and allows it to recognise the two half site consensus sequences. The importance of the dimer formation was discussed. Is there the possibility of heterodimer formation, and therefore a degree of redundancy to the T-box transcription factors?

Mutations in Tbx5, insights into Holt-Oram Syndrome

A number of talks provided a molecular insight into clinical syndromes in which known mutations in the T-box genes have been the primary cause. Holt-Oram syndrome, characterised by malformations of the heart and upper limb, occurs due to truncated variants of the TBX5 protein. Both **David Brook** (University of Nottingham, UK) and **George Nemer** (Institut de Reserches Cliniques de Montreal, Canada) provided new insights into downstream targets of TBX5. It was found that TBX5 binds to target sites in the enhancer of Atrial Natriuretic Factor (ANF), explaining the reduction of ANF expression in Holt-Oram syndrome. TBX5 also acts synergistically with NKX2.5 and GATA4 to enhance activation.

However, there are two TBX5 variants, the longer isoform has a stronger binding to the DNA. The short form is expressed in the adult. It was proposed the short form may be cytoplasmic, therefore non- functional, whilst the longer form is functionally active during embryogenesis. The functionally active isoform may not be required in the adult and therefore becomes truncated.

Along with George Nemer, **Jonathan Seidman** (Harvard Medical School, USA) revealed that Connexin 40 (Cx40) was also a downstream target of Tbx5. The connexins are a family of proteins that form pores in the cell membrane, to allow small molecule transmission. Cx40 null mice show heart defects and conduction system abnormalities similar to those found in Tbx5 mutants in mouse and humans. Jonathan Seidman stated that'Cx40 deficiency is the primary cause of cardiac defects in Holt-Oram syndrome patients.'

T-box genes involved in other human hereditary diseases

Models for other syndromes were also represented: disruption of Tbx1 and Tbx3 are implicated in DiGeorge Syndrome and Ulnar-Mammary syndrome, respectively. **Ginny Papaioannou** (College of Physicians & Surgeons of Columbia University, USA) described the Tbx3 mutation in the mouse, there were hardly any abnormalities found in the heterozygote mice (although this is the dominant condition in humans). The homozygote mice lack mammary gland induction, they lack the ulna and digits and have severe hindlimb abnormalities. Homozygote mice share similarity with human Ulnar-mammary syndrome patients although exhibit a more severe condition.

A model was proposed which aimed to embark providing an explanation for the abnormalities seen in the Tbx3 null mutant mice. Tbx3 has a key repression domain in the C-terminus. It was proposed that absence of Tbx3 might release repression of p19, a cell cycle inhibitor protein, in the mutant embryo. p19 binds and inhibits Mdm2, which normally promotes p53 degrada-

tion. Increasing levels of p19 by release of repression effectively increases p53 in the cell. p53 induces apoptosis or cell cycle arrest, and could be seen to be the cause of the loss of structures observed in the areas where Tbx3 is normally expressed.

The poster session provided another great opportunity for discussion. Posters were of a very high standard, and both complimented talks and provided information on other areas of research of the T-box genes. The T-box genes are a fundamental gene family, critical in development, and found in a vast array of developmental processes. Sept 16-18 saw researchers at the leading edge of T-box research come together for the first time to discuss current understanding of this important gene family. With good food, great talks, and of course rastaball, who could ask for a better conference!

Lucy Smith, Sheffield

Meeting for Martin Raff

Between July 3-5th a special meeting took place at UCL to celebrate the career of Martin Raff, who is due to retire later this year. The mouth-watering programme of speakers reflected the huge esteem in which Martin Raff is held and the outstanding contributions that he has made throughout his life in science. The meeting covered a wide range of topics that have interested Martin over the years and was split broadly into sessions covering, stem cells and neurobiology, cell biology and disease, behaviour/psychiatry and finally, policy and ethics in science. There was also a poster session given by old friends, collaborators and current lab members. To do justice to the many fantastic talks and discussions in a brief review such as this is impossible. Thankfully, however, BioMedCentral filmed the entire meeting and most of the talks are now available online and are well worth viewing:

http://www.biomedcentral.com/meetings/2002/raff+bscb/

The meeting began with a session on stem cells and neural development, which has been of great interest to the Raff lab in recent years. **Ruth Lehmann** discussed mechanisms of germ cell fate and migration in Drosophila and then **David Anderson** presented a summary of many years of work from his lab dissecting cell fate choices using rat neural crest stem cells as a model system. He spoke of Martin as a major influence on his approach to this problem following conversations at the early stages of his career. A former postdoc (**Ben Barres**) presented exciting data suggesting that co-culture of astrocytes with retinal ganglion cells results in a marked increase in synapse number and consequently activity. **Josh Sanes**, followed and discussed the problem of how axons and synapses become restricted to particular laminae within the brain, and how Sidekick proteins may be determinants of this within the retinotectal system.

Many co-authors of “Molecular Biology of the Cell”, were present and spoke over the course of the meeting. All praised Martin’s efforts and incredible powers of concentration (revealed by his son, Jordan, as an attribute fine-tuned during periods in charge of the children!). The first to speak was **Keith Roberts**, who described initial work from his lab on a system for studying transdifferentiation in plants (conversion of mesophyll cells to vascular cells), and interspersed his talk with photos of Martin through the ages closely monitoring his “bilateral” ectopic hair during the 70’s!

The afternoon session started with axon guidance (**Marc Tessier-Lavigne**), then patterning of neural tube, for which **Tom Jessell** presented data showing how knowledge of DV patterning within the embryo can be used to direct embryonic stem cells to produce motor neurons. The final two talks of the day dealt with neural disease. **Paul Patterson**, presented preliminary data on an interesting investigation into the effects of viral infections of the mother, which can lead to offspring mice exhibiting schizophrenic and autistic behaviour. **Charles Weissman** completed the day with a discussion of prion diseases and their transmission.

The next morning brought the first of two cell biology sessions, with talks initially on Notch signalling (**Julian Lewis**), and then control of cell cycle, by **Jordan Raff**, who presented data using GFP fusion proteins in fly, to address the issue of spatial and temporal regulation of cyclin B destruction during the cell cycle. He also paid tribute to his father, putting his success down to a fascination with all areas of science. **Alan Hall** mentioned the draw of many scientists (himself included) to the LMCB in order to interact with Martin, and his influence on the introduction of 4-year PhD programs in the UK.

In the afternoon three speakers discussed issues relating to cancer. First, **Gerard Evan** discussed an astonishing recent study from his lab, where invasive and angiogenic pancreatic ß cell tumours could be induced in mice by just two molecular changes, activation of c-myc and suppression of apoptosis. **Ron Laskey** followed, and described DNA replication controls and their usefulness as a basis for cancer diagnosis. **David Lane** finished the day highlighting the need to translate basic knowledge of cancer into practical treatments and how frustrating this can sometimes be.

The final day saw the second Cell biology session, which included two talks dealing with the related problems of cell shape (**Paul Nurse**) and cell size control (**Tim Mitchison**). The later described some experiments (motivated by discussions with Martin) to try and understand how the size of the mitotic spindle is determined, as a step towards understanding the problem of how cell size is controlled.

The final talks dealt with more general topics and the questioning and discussions could have continued all night! Initially, there were two talks dealing with sexual behavior (**Simon Levay** and **Richard Axel**), and then **Lewis Wolpert** spoke, as always, engagingly, about depression and its devastating effect and the long way we are from a complete understanding of its causes. A lively open forum followed, dealing with scientific publishing, particularly those changes brought about by the Internet and the effect on relationships between publishers and scientists.

Gerald Fischbach spoke highly of Martin and the legacy that he will leave in cell and developmental biology, before reviewing science policy and ethical issues with regard to stem cell therapies. **Bruce Alberts** gave an overview of the role that National Acadamy plays in both the US and internationally, especially in the promotion of science education. Finally, euthanasia was discussed by **Paul van der Maas**, who gave a frank and honest review of the approaches to it taken in the Netherlands.

There was time left, however, for the man himself to have the final word and give us a brief reflection on his scientific career. Initially he sincerely thanked **Anne Mudge** for her great efforts in organising the meeting

and all of the speakers for their kind words, and fantastic talks. Although "like being present at your own funeral", he enjoyed the meeting immensely, being "by far the best meeting" he's ever been too. He thanked all those who had influenced his career, and described how very lucky he has been, especially early on with the mentorship of **Av Mitchison**.

Martin is looking forward to his retirement, and will keep an office at LMCB where he'll work on issues, such as euthanasia, about which he feels passionately. The next generation of scientists will also be thankful that he will work on one more edition of Molecular Biology of the Cell.

In summary, this unique meeting was a huge success, full of great science and lively discussion - and also a lot of fun. A fitting tribute, then, to a man with incomparable qualities!

Steve Pollard, ISCR, Edinburgh

Post-docs and PhDs

Lucy Smith and **Steve Pollard** received a £50 reward for their contributions. You could too if you volunteer to review a meeting. Contact Andy Furley.

Meeting Report: "Women on Top", Reflections on Women in Science

October 29th 2002 University of Aberdeen

"Fixing the Leaky Pipeline"

This one-day meeting, which brought together some 100 scientists, teachers and industrialists, as well as some school children, was essentially a progress report on efforts to achieve equal representation for women at all levels in science. There is still a long way to go, but changes are beginning to take place and many of these promise to be positive for men as well as women. They include mentoring schemes which provide support and career advice for young scientists, flexible working and addressing issues relating to short-term contracts and career structures. The conference sessions addressed in turn, the scale of the problem, why it matters, its underlying causes and what's being done to address them.

The scale of the problem **Sabine Kleinert**, a senior editor at the Lancet, opened the meeting with an historical overview of women in science and outlined the scale of the problem. She noted that women now have equal access to education and constitute about half of all undergraduates, graduates and post-docs in the life sciences. She stressed that the real issues now lie with a struggle for equal employment opportunities. There is still a real dearth of women at higher levels, in tenured positions and in key policy and decision making jobs. In the UK only 4% of professors of science, engineering or technology are women and they make up less than 10% of scientists elected to fellowship of the Royal Society, Royal Academy of Engineering and Institute of Biology. This is the **"leaky pipeline"**. The situation varies between countries; Finland, for example, has one of the highest percentages of women professors in Europe. Here a quota system has been operating for 15 years and the percentage has risen from 4 to 20%. **Gill Samuels**, senior director of science policy and scientific affairs Europe, at Pfizer, the world's largest pharmaceutical company, described a similar leaky pipeline in Industry, with women making up 54% of graduate intake at Pfizer, 22% of team leaders, less than 5% at (non board) top management levels and until this year only one out of seven members of the Pfizer board of directors.

Why does it matter? **Mairead Dunne** from the University of Sussex provided a sociologist's perspective on why it matters to have equal participation. She argued that the problem is not just personal but concerns society as a whole, citing the strong economic argument for not losing such large numbers of skilled scientists from the workforce. Mairead Dunne also advocated further study of the rapidly changing relationships between women and men and urged us to guard against stereotyped views of the sexes. However, at a number of points in the meeting the image of science in society was discussed and whether a higher profile of women in science and their impact on culture and policy making might alter the prevailing negative public perception of science and scientists.

Why are women under-represented? There are many reasons why women are under-represented at tenure position levels and above. These include personal issues such as the low self-esteem and expectations of many young women scientists. The careers of male partners/husbands also often take precedence, particularly when couples have to find jobs in the same place. This imbalance, which is due to both cultural expectations and child rearing, makes women most likely to undertake serial short-term post-doctoral jobs in which they gradually become frustrated by the lack of scope for exploring their own ideas and eventually, due to their age, too expensive for further employment. **Elizabeth Griffin** (Dept. of Astrophysics, University of Oxford) presented herself as a case in point, but argued that the underlying problem is not gender-based, but rests with this employment strategy (short term contracts), which for the reasons above affects women most. An improved and clear career structure for post-doctoral researchers would be advantageous for men and women and may also help to promote more women to tenured positions.

Towards a solution: good practice and beyond A number of speakers reported on new schemes to tackle the under-representation of women at the top in both industry and academic departments. At Pfizer, **Gill Samuels** described a survey of the views of both men and women on promotion and how to achieve it. Both sexes found the criteria for promotion obscure. Interestingly, more men than women felt the support of senior colleagues was important and men also placed greater emphasis on personal drive. In contrast, women had difficulties with male networks and commented that typical masculine behaviour was the cultural norm. Pfizer responded by clarifying promotion criteria for research and management routes, putting in place women's support groups (which were open to men) and introducing flexible working, including summer breaks and home working. It remains to be seen if these new practices will improve the promotion of women, however, they may also signal an attitude change within the company; as of this year 2 further women (now 3 out 7) have been appointed to the Pfizer board.

The "Athena Project" (see below) has recently supported another approach to the problem of Women's promotion in academia, which involves mentoring. Athena has funded a number of trail schemes which are

designed to boost confidence and provide career and personal advice to post-doctoral researchers and group leaders under 35. Some schemes involved both men and women, while others only provided mentors for women. **Dorothy Griffiths**, Head of Organisational Behaviour and Human Resource Management Section, Imperial College, reported on their scheme. She stressed that each institution should design a scheme to suit themselves, that it made a huge difference to have it taken seriously at the top and that this was signalled loudly to the college as whole (the dean sent personal letters to male and female colleagues asking them to be mentors). Once found, mentors for both sexes were given a short training session and asked to contact their mentees (a sort of academic blind date) and a minimum of 3 meetings took place. So do such schemes help the leaky pipeline? The feedback at Imperial was overwhelmingly positive and all the women said that their confidence had increased; we must now wait and see if this will make a difference at the top.

The failure to promote women in science is increasingly recognised and institutions are beginning to be challenged to address it. Some pilot schemes promoting good practice are in place and many ideas that are coming out of these projects are likely to improve all our lives for the better. However, at present, real change does seem painfully slow.

Kate Storey, Dundee

Useful Contacts:

The **Athena Project** is supported by UK Higher Education (HE) funding, representative bodies, the Department of Trade and Industry (DTI) and the Office of Science and technology (OST). It grew out of the Committee of Vice-Chancellors and Principals' (now UniversitiesUK) commission on University Career Opportunities agenda to remove barriers to discrimination to women in HE at all levels. www.athena.ic.ac.uk

Equalitec, a website to encourage recruitment, retention and progression of women in ITEC careers, partly funded by the DTI, aims to be a tool for companies and HE institutions to address gender imbalance in the workforce www.equalitec.com

AWISE Association for Women in Science and Engineering www.awise.org

Parents at Work, a charity campaigning for flexible working for both men and women www.parentsatwork.com

Daphne Jackson Memorial Fellowships, fund women returning to science www.DaphneJackson.org

Also see **EMBO**:
www.embo.org/projects/women/index.html

Look out for the **Susan Greenfield** report for the government on Women in Science, due out end of Nov. 02. http://www.guardian.co.uk/women/story/0,3604,849133,00.html

Future BSDB Meetings

Autumn 2003

Special joint meeting with French Society of Developmental Biology

Nice, France in September 2003

Organisers: S. Noselli, P. Therond, P. Leopold and A. Martinez Arias

As a prelude to more European integration *(sic)*, we have reached an agreement with our sister society in France to hold a joint meeting in 2003. This will take the place of our usual Autumn meeting and is scheduled to be held in Nice. Given that the cost of travelling to Nice from Luton and Liverpool is nowadays significantly less than the average rail fare between any two cities in the U.K., this rather more exotic venue should not prohibit attendance at what promises to be a very stimulating and productive meeting.

Topics will include periodic processes, embryonic patterning, morphogenesis, cell shape and migration, trafficking, cellular symmetris, tissue growth and global approaches to developmental biology (genomics and proteomics). Further details will follow in the next Newsletter.

Spring 2004

Annual Symposium

To be held jointly with the Genetics Society at Warwick University

14 March - Tuesday 16 March, 2004

Topics for Future Society Meetings

One of the major tasks of the BSDB Committee is to select topics to be covered in future meetings and then to ensure that these meetings are well organised and successful. It is obviously crucial that meetings are supported by the members of the Society, and we always welcome suggestions for future topics. If you have an original idea for:

- **a half-day theme for the Annual (Spring) Symposium**
- **a two day Autumn meeting**
- **a one day workshop**

please get in touch with the **Meetings Secretary:**
Jamie Davies (jamie.davies@ed.ac.uk**)**

Other Related Meetings & Courses

Embryology: Concepts and Techniques in Modern Developmental Biology

Marine Biological Laboratory, Woods Hole, Mass., USA

15th June - 27th July 2003

Course Directors: **Richard Harland**, UC, Berkeley; and **Joel Rothman**, UC, Santa Barbara

The Embryology Course at the Woods Hole Marine Biological Laboratory offers students a unique exposure to developmental mechanisms in animals representative of the entire span of metazoan phylogeny. This intensive six-week summer course, involving lectures, discussions and laboratory, is directed toward pre- and post-doctoral scientists and faculty from around the world who are committed to research and teaching careers in developmental biology. The course, taught by leading developmental biologists, explores both classical and current problems in development set within an evolutionary framework and exploits the wealth of genomic information and many forefront technologies, including advanced imaging, embryological manipulation, and molecular phylogenetic analysis.

For more information see: http://courses.mbl.edu/

Apoptosis 2003

From signaling pathways to therapeutic tools.

January 29 - February 1st, 2003 European Parliament Conference Center (Luxembourg)

Register at :

http://www.transduction-meeting.lu

The meeting is not sold out and we are encouraging potential participants to submit papers for oral and poster presentations. More than 40 additional talks will be added chosen from registered participants. Selected speakers will receive a notification early January 2003.

- Speakers are invited to contribute to a regular number issue of Biochem Pharmacol (referenced by Medline, ISI-Current Contents);
- Speakers and authors of posters are invited to submit papers for a future volume of the Annals of the New York Acad Sci (Medline, ISI-Current Contents); abstracts and full text will also be published in the Annals
- Online (available 2003 through HighWire Press);
- Prior to the meeting, all abstracts will be available online at http://www.pharma-transfer.com

Our website contains additional information about Luxembourg, selected hotels, our expo and includes now a link to a secure credit card payment site. In the case of a problem with this site do not hesitate to contact us.

Introductory Courses - the EMAP 3D Digital Atlas of Mouse Development and EMAGE Gene Expression Database.

EMAP, the Edinburgh Mouse Atlas Project, have developed both the EMAP 3D Digital Atlas of Mouse Development and the spatial EMAGE database of gene expression patterns during mouse development (http://genex.hgu.mrc.ac.uk/). Both resources are community based and available free of charge to all.

A three-day course has been devised in collaboration with the HGMP-RC to take participants step-by-step through the use of EMAP and EMAGE resources.

Subjects considered on the course include:

- Classification of Developmental Stages
- Features of the EMAP Digital Atlas
- Explanation of EMAGE - How to search and how to submit data to the database.

Participants are encouraged to bring their own gene expression data in the form of JPG or GIF images of wholemount or sectioned in situs, as there will be plenty of time on the course to make a genuine EMAGE submission.

Duration:	3 days
Tutors:	Lisa Mullan (HGMP) and Jeff Christiansen (EMAP)
Cost:	£176.25 (inc. VAT) for registered academic users

For information on course locations and times, please visit: http://www.hgmp.mrc.ac.uk/About/Courses/

Glia: Role in Neural Development and Repair

The 6th meeting of the UK Glial Cell Club University College London, 26th February 2003, 9.30am-5.30pm

Speakers:

C D Stiles	Transcription factors in spinal cord development
F Guillemot	Proneural proteins and CNS lineages
C ffrench-Constant	Integrins and oligodendrocyte development
R D Fields	The role of impulse activity in glial development
R Franklin	Strategies for promoting remyelination in the CNS
L Wrabetz	Transgenic models of peripheral neuropathies
P Charnay	Molecular analysis of Schwann cell development
V Gallo	Transgenic approaches to study the oligoderdrocyte cell cycle and development
M N Woodroofe	The role of chemokines in multiple sclerosis
R Martini	The impact of immune cells on inherited demyelination
J W Fawcett	Proteoglycans in CNS regeneration and plasticity
J Salzer	Schwann cell-neurone interactions
M V Chao	Neurotrophin receptors and Schwann cel development.
S Temple	CNS stem cells
G Fishell	The role of hedgehog and notch signalling in CNS glial development

There will also be an extensive poster session.

The meeting will take place at:
The Brunei Gallery Lecture Theatre,
School of Oriental and African Studies,
Thornhaugh Street,
Russel Square, London WC1.
Tube: Russel Square;Goodge Street,; Euston Sq.

Registration £35 (£20 for students)

Organisers:
Kristjan R. Jessen, Richard Reynolds, Rhona Mirsky and Debbie Bartram.

For further information contact:
d.bartram@ucl.ac.uk (tel 020 7679 3334)

Instant Notes: Developmental Biology

R.M.Twyman
BIOS Scientific Publishers. Oxford 2000
ISBN 1859961533 £16.99 paperback

One of the motivations for writing this book, as stated in the preface, was to tackle the problem that "many more students are required to learn about development as a short module forming part of a larger course". As the course co-ordinator of just such a module, and one that is not just part of a single course but a component of several, I can empathise with this difficulty. It is indeed hard to convey the subject from scratch in a few lectures, and at the same time make it relevant and interesting to students pursuing a variety of degree courses. I should, therefore, welcome a text that purports to simplify matters for my students and myself. However, I am not certain that this book is the panacea for my problems.

Instant Notes: Developmental Biology is ambitious in its coverage, and manages to pack a lot of information into a small space. For model organisms, it goes well beyond the more traditional systems. *Bacillus* sporulation, yeast mating type switching, the *Dictyostelium* life cycle, and aspects of ascidian, mollusc and annelid development are all described. A section is also devoted to plant development. There is a clear and logical organisation to the book. The fourteen major Sections are each divided into a series of 3-7 topics of manageable size (between 4 and 6 pages). These all begin with a box of "Key notes", which are then elaborated upon in the rest of the topic. Concepts are presented at the start of the book, and basics such as gene expression, the cell division cycle and cell structure are all included. There is useful cross-referencing between sections. The usual paradigms (such as vulval specification in *C. elegans*, the *Drosophila* eye and the vertebrate limb) are all covered, but in addition the book delves into other subjects, such as the intricacies of mammalian organogenesis, including topics on development of the kidney, heart and endodermal organs. There are occasional references to human disease, but little mention of the use of modern advances such as genome sequencing projects.

The quality of the illustrations is variable - some are good, but others are rather poor, with little sense of time or scale. Undoubtedly, they have been done simply so that they can be easily reproduced by students in exams, but in many cases the images of the beautiful embryos that we know and love have been transformed into sketches that bear little resemblance to the original subject matter. Treatment of experimental methods is rather minimal. There is a short section devoted to developmental mutants (with a little on mutagenesis and screening), transgenesis and cellular techniques, but this section stands alone - in the rest of the book, there is very little emphasis on experiment. When techniques are introduced, they are sometimes simplified too far: complementation testing using homozygote parents, for example, is a rather unusual scenario for developmentally important genes, where mutations often lead to an embryonic lethal phenotype. A little more on simple Mendelian genetics would have been helpful here.

Without a doubt, many students will love this book (see the accompanying review). I have to admit to being prejudiced against the *Instant Notes* format myself. My aim is to try to get students to understand concepts rather than learn a long list of facts - but here is a book that is largely the latter. My other criticism is that the pages are quite liberally sprinkled with typographical errors. With so many new (and frequently, very peculiar) gene names for a student to encounter, it is not helpful if they (and the names of those who discovered them) are constantly spelt incorrectly. In addition, there are other occasional irksome details: Tolloid, for example, is confusingly described alongside Dpp as a BMP homologue (it is indeed a BMP1 homologue, but this is quite different to Dpp and the other BMPs). The book will be considerably improved when these minor errors have been corrected in a subsequent edition. However, in conjunction with the larger texts on offer (see BSDB Newsletter 44, 2001), this book should make a useful addition to the library, and I imagine would be helpful to a postgrad or postdoc entering the field for the first time, with a need to assimilate facts quickly.
Tanya Whitfield, Sheffield

But then again……

This is a clear, concise and portable handbook suitable for undergraduates who are studying the subject of developmental biology for the first time. It has a direct style and is packed with information, which is introduced in a way that progressively builds subject knowledge. This approach conveys the essence of the topics covered, thus avoiding the common complaint of most undergraduates of being overburdened with cumbersome detail; which they don't feel ready to absorb.

I found that the short digestible topics were ideal for reading when time was limited, when I wouldn't have contemplated starting a lengthy chapter in one of the larger more comprehensive alternatives. With increased confidence, I could then use the sections entitled 'related topics' and 'further reading,' to further integrate my learning by cross referencing to other topics within the book and to an extensive list of current papers and more traditional textbooks.

In my opinion this book is an invaluable tool when first exploring the complex subject of developmental biology.

Julie Askew
Undergraduate, Sheffield University

Molecular Biology of the Cell 4th Edition

Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts & Peter Walter
Garland Science, 2002
ISBN 0815340729 £44.00 (Amazon)

Our knowledge of cell biology has increased dramatically during the eight years since the third edition of *Molecular Biology of the Cell* was published. With extensive revisions and reorganization, the fourth edition does an excellent job of incorporating the wealth of new information that has been uncovered in the intervening years. This includes several references to genome projects and the functional genomics era. As with previous editions, this book is extremely well written. Numerous informative diagrams complement the clarity of the text and microscopic images and photographs are interspersed throughout.

The book is now split into five parts instead of four. Many of the early chapters in the first two sections, dealing with basic cellular components and processes, have been expanded and reorganized. The third part of

the book is dedicated to the techniques used to study molecular and cellular biology. It includes concise explanations of many new methods that have revolutionized the field in the last few years such as microarrays, the use of GFP-fusion proteins and mass spectrometry. There is a new chapter entitled "Pathogens, Infection and Innate Immunity" which reflects an increase in knowledge about different types of infectious organisms, the mechanisms underlying their infection and how our innate immune system deals with such constant attacks.

Another new feature is a CD-ROM, entitled *"Cell Biology Interactive"*, that accompanies the book. It contains over 90 video clips, animations, molecular structures and high-resolution micrographs. Amongst the features, users can rotate three-dimensional models of key macromolecules, watch cells undergo apoptosis and observe the division of chromosomes. The elongation cycle of protein synthesis is one of a number of events portrayed in a well-crafted and helpful animation. These features help bring to life some important cellular processes but the CD-ROM covers only a fraction of the material presented in the text. One challenge ahead will be how to incorporate the ever-increasing volume of information about our cells into a reasonably sized book. This paperback edition weighs a healthy seven pounds and comprises nearly 1500 pages. The CD-ROM clearly illustrates the potential of this medium for presenting cell biology to future generations of students.

MBoC remains one of the best textbooks for those studying molecular and cellular biology. With its up to date and in depth coverage of many areas, this revised version will also serve as a valuable reference for researchers wanting to keep up with events outside of their chosen field.

Caroline Wilkinson, Paterson Institute, Manchester

'Molecular Biology of the Cell - A Problems Approach'

John Wilson and Tim Hunt
Garland Science, 2002
ISBN 0815335776 £19.00 (Amazon)

This is a book that will make your students (and, probably, you yourself) think. 'Alberts' has been for a long time my favourite introductory text on cell biology, and a book that I've recommended to undergraduates following a variety of courses. Now, this new edition of the 'Problems' book comes as a welcome partner to the new, fourth edition of the main volume.

The word *'Problems'* in the book's title indicates that it contains a selection of questions designed to explore the content of its companion, *'Molecular Biology of the Cell'* (see above). In fact, this simple word also reveals much about the book's other intentions: it tells the reader about the questions asked in research laboratories, it lays bare the ways in which experimental biology is conducted and the practical difficulties encountered along the path to establishing the 'facts' that eventually appear in the textbook.

The book is well-organised and structured to reflect its companion. It contains a pleasingly large number of figures and tables, many offering authentic and recent experimental data. The problems are presented in a variety of forms requiring more or less work to devise an explanation. Frequently, the 'heavier' problems' on a page are followed by some light refreshment such as a True/False question or one which reveals an 'interesting fact' about blindness, lampbrush chromosomes or polar bears. As such the book manages to present itself as a useful, approachable tool for learning rather than the dry, colourless selection of questions found at the ends of chapters in many textbooks.

As the authors suggest in their Preface, there are many problems here that would be best addressed in group discussion, something that lends the book towards the more modern teaching and learning methodologies being adopted in many universities.

Some of the problems are reminiscent of the old maths exam paper gems ("If it takes three men with two buckets twelve hours..."), but this is deceptive. In fact the occasional eccentricities serve to reinforce the relevance of molecular cell biology to the real world, while at the same time guiding the student towards the 'why' and the 'how', rather than the simple 'what'. Together with its companion volume, *'A Problems Approach'* (below) will help students towards a deeper understanding of the subject matter, encourage them to see the connections between the different underlying elements, and show them the importance of lateral thinking.

This book should prove useful not only in developing an enquiring mind amongst students, but also, perhaps, in encouraging more of them to pursue a research career.

Gareth Cuttle, Universidade Federal de Santa Catarina, Brazil

Principles of Cell Proliferation

John K. Heath
Blackwell Science, 2001
ISBN 0-632-04886-7 £22.50 paperback

Life's perpetual cycle relies on cell proliferation. Cell multiplication and the growth of different cell populations are extremely important processes that can have good or bad outcomes. During embryonic development one cell gives rise to all the cells in an organism – the good outcome of cell proliferation. During tumourigenesis one cell can produce a variety of malignant, destructive cells – the nightmare result of cell proliferation. In the words of Harold Pinter, cancer cells "… have forgotten how to die/ And so extend their killing life" (from the poem "Cancer Cells", March 2002). Hence cell proliferation and cell death have to be very well controlled at the molecular level.

Throughout the pages of this book Heath explains the underlying molecular mechanisms behind eukaryotic cell proliferation. *Principles of Cell Proliferation* progresses from how cells grow to how they die, by way of the mechanisms that regulate these processes. The book begins with chapters on growth factors and their receptors. The way these interact and how the signals generated are translated to the cytoplasm and the nucleus is the focus of the next two chapters on intracellular signals and gene expression. The cell cycle engine with its checkpoints and tight controls is explained in the following chapter. In the context of cell proliferation and illuminated by the descriptions of the previous chapters the author then turns to what happens when these mechanisms go wrong. The last three chapters of the book deal with oncogenes, tumour supressors and cell survival. At the end there is a further reading list that in the author's words "is not a scholarly compila-

tion", but will make for a good start if the reader is interested in the subject.

Principles of Cell Proliferation is a good background book for the study of eukaryotic cell proliferation. It will make a good companion for undergraduate courses on the subject. However, its major flaw is the lack of a chapter on DNA proofreading and repair mechanisms. DNA damage recognition and repair processes have control over progression through the cell cycle. Their importance is highlighted by various cancer predispositions that are associated with DNA repair defects. Perhaps this should be mentioned more extensively in a book about cell proliferation and not just superficially in the p53 context. Another criticism goes to the very poor illustrations of this book (starting with the cover photograph). The attention of the reader is not captivated just by a good text, but also by figures, where proteins and cells are more than just grey squares and triangles.

Overall, *Principles of Cell Proliferation* gives a good description of how cell live, multiply and die. John K. Heath writes in a very clear way that makes complicated concepts seem simple and this book is a good starting point in the mysteries of cell life and death.

Sofia J. Araújo, Guy's, London

The Evolution of Developmental Pathways

Adam S. Wilkins
Sinauer Associates, 2002
ISBN 0-87893-916-4 £42.99 (Amazon)

In case anyone hasn't noticed - evolutionary developmental biology is where it's at. It wasn't always so, however. Twenty years ago, the number of people who were keenly interested in the developmental mechanisms underpinning evolutionary change could happily have held a meeting in a bus shelter. These days they can fill somewhat bigger venues. In fact, these days there's nothing to be ashamed of; evo-devo is mainstream, indeed, it is trendy. Evo-devo as a field has arrived, and befitting that status people are devoting whole books to the subject, and here's one of them, *The Evolution of Developmental Pathways*, by Adam Wilkins, Editor of Bioessays.

This books starts by explaining the history of Evolutionary Developmental Biology. Initially, the focus is on the work in the eighties that kick-started the current interest in EDB, but then the author goes on to consider the longer history of the relationship between evolutionary biology and developmental biology. This relationship has not been an easy one, and the twists and turns that it has suffered are well described. However, as the author points out, there is now a greater level of mutual respect between the two camps than there has been for a 150 years, and this in parts helps explain the current vitality of EDB. He then goes on to consider how one can reconstruct developmental evolution. Firstly, he discusses the use of fossils and systematics, and makes the point that such studies are vital for determining the actual sequence of developmental changes. Complementing these, are the comparative molecular studies which help inform us of the developmental mechanisms that underpin evolutionary change.

The author then moves to discuss the issue that lies at the heart of this book, the importance of genetic pathways. Again he starts with a historical explanation, detailing the genetics that lead to the elucidation of pathways that control animal development. This is followed by a chapter which considers the role of conserved genes in animal development, Hox genes and Pax etc. The next few chapters analyse the roles of developmental pathways through case studies; sex determination, segmental patterning in insects, and lastly the development of two organs fields, the nematode vulva and the tetrapod limb. In each the pathways themselves are discussed, and how they were potentially modified during evolution. The point here being that there are conserved developmental pathways that can underpin seemingly dissimilar process, and also that such pathways are differentially modified during evolution.

The next few chapters in the book deal with realities: what are the materials that are required for the evolution of developmental pathways, what are the constraints that help channel developmental evolution, how do genetic pathways relate to morphogenetic processes, and finally, how developmental evolution can be linked to speciation. The penultimate chapter discusses the origins of the metazoa, and gives a clear account of the recent results that have lead to the new metazoan phylogeny. In the final chapter, the author makes the case that developmental pathways are at the very centre of the evolution of development, and he further suggests that they provide an analytical framework through which we can understand EDB, and I have some sympathy with this viewpoint. The book then finishes with a discussion of the future for EDB, and with the conclusion that, as much as there has been a huge effort recently in understanding EDB, the work has just begun.

So, there are a few books dealing with evolutionary developmental biology on the market - why choose this one? Well, one aspect of this book that I admire is that the author displays a real breadth and depth of knowledge. He gives Evolutionary Developmental Biology a context, something that is lacking in other discussions of this field. This is particularly evident in the fact that where possible the author discusses the history of each issue. Another plus to this book is simply that it's lucid and reads well. In summary, this is a good book, it contains a wealth of information and it would be a useful addition to any library - well not one in the French department, but you know what I mean.

Anthony Graham, Guy's, London

Beyond Heterochrony : the evolution of development

Miriam Leah Zelditch (editor)
Wiley-Liss, 2001
ISBN0471 379735 £74.50

The term heterochrony was coined by Haeckel and, as Smith (2002) helpfully discusses, is a term with a curious history of shifting meanings. Zelditch here gives four current definitions ranging from the precise ("heterochrony refers to changes in developmental rate or timing that result in parallelism between ontogeny and phylogeny") to the all-encompassing ("heterochrony permeates every nook and cranny of evolution. Indeed, without it evolution wouldn't have happened. For it explains everything, from the shape of a delphinium flower, to a horse's foot, to the song of a bird" - McNamara, 1997). The latter definition is rejected by Zelditch as lacking any means of falsification and adequate precision to be measurable. The book's title implies processes other than heterochrony. Haeckel gave "heterotopy" – change of position; and Brian Hall, in a helpful foreword, adds "heterotypy" (change of type) and "het-

erometry" (change in amount) to a classification of changes in development which lead to changes in form during evolution. This book is, therefore, firmly in the area of Evolutionary Developmental Biology ("evo-devo" to those who prefer abbreviations), but prospective readers should be wary : it is not much about genes. Indeed, the index does not list *Drosophila* or *C.elegans*: a first for a modern book on development? Rather, the emphasis is on changes in form, and how to analyse them, and covers fossil forms as well as recent examples.

"Beyond Heterochrony" is not a conference volume, but a set of commissioned articles on less standard systems and little of the work has appeared elsewhere. I had doubts that a multi-author volume in the evo-devo field could have much of a shelf-life, but the unfamiliarity of the systems studied, and the emphasis on morphology rather than molecular genetics reduces that concern. The systems and concepts examined are:

- The developmental basis of the evolutionary loss of anti-predator shell features in a group of gastropod molluscs
- The use of developmental sequences to assess evolutionary changes in floral development in the family Hydrangeaceae
- Change in relative position of a structure as a mechanism in the evolution of flowers :the "mostly male" theory
- Heterochrony in Trilobites
- The spatial complexity and evolutionary dynamics of growth, using Piranha-fish as a model
- Growth patterns in the phenotypically variable marine snail *Littorina saxatilis*
- Heterochronic and non-heterochronic models for the evolution of pigment pattern diversity in ectothermic vertebrates.
- Testing the hypothesis of heterochrony in the bivalve mollusc genus *Chione*
- A test of modularity and dissociation in the regional proportions of snakes
- Novel features in limb development in a skink and a direct-developing frog

This list should demonstrate that the book is not a skim-read, and I confess to not feeling competent to judge the quality of many of the contributions. The chapters on snake body regions and limb development in skinks and frogs are on topics I know something of, and I found them stimulating and well-written. They do, however, illustrate the hazards of book production in this field : Carl's account of limb development in the direct-developing frog *Eleutherodactylus coqui* has already been rendered somewhat out of date by Hanken et al (2001). [Incidentally, I do wish *E.coqui* workers would not write as if this species was unique. It happens to be the only lab-friendly *Eleutherodactylus* so far, but there are over 400 species in the genus and many other direct-developing frog genera have now been found].

Who is this book aimed at? Certainly not the beginner in the field of morphometrics : many of the chapters are highly technical and the overview of heterochrony in the preface is too condensed to be more than a taster. For those interested in getting into the morphometric aspects of evo-devo, a good start is Hall's *Evolutionary Developmental Biology* (second edition, 1999). *Beyond Heterochrony* could be a fascinating follow-up, with detailed accounts of a wide range of systems that not only take the reader beyond heterochrony, but well beyond *Drosophila*, *Xenopus*, *C.elegans* and our other standard "model" systems.

I think it is a pity that the book did not include a fuller discussion of what heterochrony is and more of an attempt to link the growth-morphometric approaches to evo-devo to those of molecular genetics. The book, however, is a valuable contribution because of its wide compass and unfamiliar examples.

References

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Smith, K.K. (2002) Sequence heterochrony and the evolution of development. Journal of Morphology 252, 82-97.

Roger Downie, Glasgow

Zebrafish

Ed. Christiane Nüsslein-Volhard and Ralf Dahm
Practical Approach Series
Oxford University Press, 2002
ISBN 0 19 963809 8 (Hbk) £80
0 19 963808 X (Pbk) £40

This book is an excellent tool for researchers working with, or planning to work with zebrafish. There is information on the background of the techniques used as well as the protocols on how to perform the techniques. The book contains more than seventy protocols describing some of the widely used techniques used in zebrafish research from microinjection, mounting, treatment of fish diseases and mapping. Each of the seven chapters was written by different groups of researchers in the field.

Keeping and raising zebrafish Michael Brand, Michael Granato and Christiane Nüsslein-Volhard.
The first chapter describes how to set up an aquarium for raising zebrafish, how to raise mutant and wild-type stocks and how to keep them healthy and breeding. This includes information on the water required, the room conditions, feeding and cleaning and also how to maintain the stocks of wild-type and mutant fish. This chapter also covers some of the diseases that can affect zebrafish and suggestions of treatments and preventative strategies. There are protocols for setting up matings, collecting and sorting the embryos, raising artemia for feeding, isolating and freezing sperm from live zebrafish in order to maintain mutant stocks as frozen sperm or as a backup for live stock. Although all the protocol descriptions are clear, I think some of the protocols describing the adult fish manipulation in this section could have benefited from having anatomical diagrams.

Looking at embryos. Stefan Schulte-Merker
The next chapter gives a thorough description on various ways to mount both live and fixed embryos. The chapter also describes the analysis and visualisation of gene expression and various sectioning techniques. There are protocols for single and double labelling with in situ probes and triple labelling with in situ probes and antibody staining. Also protocols for antibody staining in both early embryos and larval stages, for flat mounting of early to mid-somitogenesis stages in araldite and the

preparation of paraffin wax sections for subsequent antibody detection.

The Morphology of larval and adult zebrafish. Thomas F. Schilling
This chapter has information of the late stages of zebrafish development and anatomy. The chapter contains an extensive description of the adult form and the larval and juvenile development of the skeleton, musculature, nervous system, cardiovascular, digestive and the reproductive organs. Protocols include differential staining of cartilage and bone in whole larvae and adults by Alcian blue and Alizarin red, Bodian Silver/ Cresyl Violet method to visualise neurofilaments and sectioning and histological stains of larval or adult tissue.

Cell labelling and Transplantation techniques. Donald A. Kane and Yasuyuki Kishimoto
This chapter describes the methods for injecting lineage tracer into the embryo and techniques for transplanting cells from one embryo into another. It includes a list of some of the vital dyes that are used in these techniques and their properties and some useful pictures and diagrams of the transplantation technique and images of some transplantation results. There are protocols for labelling whole embryos to be donors for transplantation, labelling single cells for lineage tracing, DMNB-caged flouroscein photoactivation, construction of transplantation needles and observation of live fluorescent cells.

Manipulating gene expression in the zebrafish. Darren T. Gilmour, Jason R. Jesson and Shuo Lin.
This chapter in concerned with the methods and techniques used to transform zebrafish. Useful diagrams and a thorough description of microinjection are included in this chapter . The use of DNA, RNA BACS and morpholino for injection and the generation of stable germ line transgenic lines are covered. There are protocols for preparation of DNA for microinjection, identification of germ line transgenic zebrafish by PCR and modification of artificial chromosomes using Chi-stimulated homologous recombination.

Mutagenesis. Francisco Pelegri Various methods for mutagenesis: chemical, insertional and radiation are covered in this shapter. It discusses genetic screening strategies and selection of genetic lines on which to carry out a genetic screen. Protocols in this chapter include Gamma-irradiation of mature sperm, production of fish carrying multiple retroviral insertions, ENU mutagenesis of post- and premeiotic adult male germ cell and a protocol for a family inbreeding screen.

Mapping and cloning. Robert Geisler
Genetic maps, radiation hybrid maps, mapping approaches and mapping strategies, high-throughput mapping and how to calculate a map position are described in this chapter. There are protocols for radiation hybrid PCR and electrophoresis, DNA isolation from whole adult fish, detection of single-strand conformational polymorphisms (SSCPs) and screening of library filters.

Appendix The appendix contains a list of suppliers and contact information. There is also an atlas of embryonic stages of development in the zebrafish including DIC images, written descriptions of important development stages and staging pointers. (Ralf Dahm) The final appendix is a table of zebrafish mutations. This table includes gene abbreviations and the full name of the locus. It gives a description of the phenotype, a reference and where known the gene product. (Hans Georg Frohnhöfer) The protocols in this book are clear and contained in shaded boxes making them easy to pick out and there is a full index of the protocols at the beginning of the book. The text surrounding the protocols makes the book a useful information reference text in addition to the protocols it contains. The one drawback with this book is that the colour pictures are located in an independent section separate form the text which describes them while their black and white counterparts are in the correct location. I think that having the colour picture next to the writing describing it would have been very useful. This however is a small issue in what is otherwise very useful, accessible and visually pleasing book.

Katy Berry , Sheffield

"Embryos in Wax: Models from the Zeigler Studio"

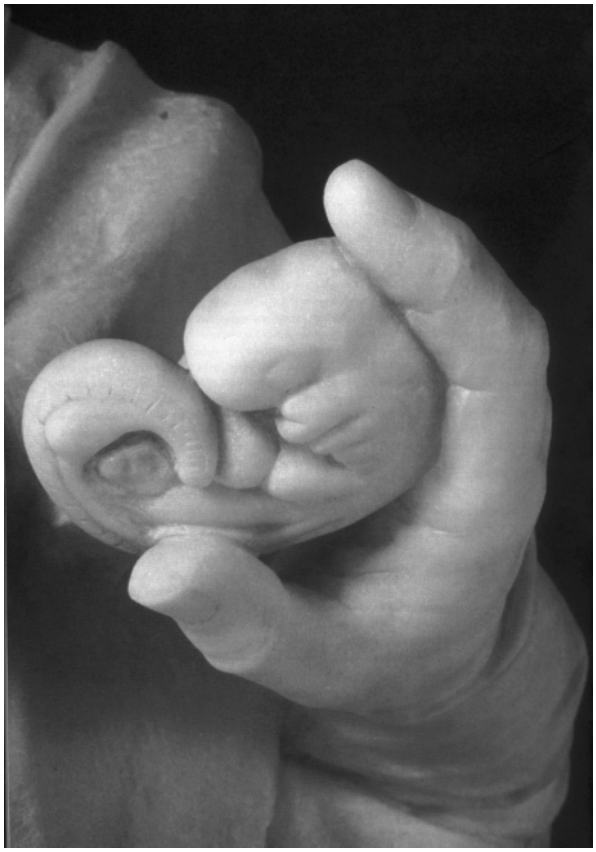
Nick Hopwood
Including a reprint of "Embryological Wax models" by Friedrich Ziegler
Cambridge: Whipple Museum of History of Science
Bern: Institute of Medical history, 2002.
ISBN 0-906271-18-5 £13.50

This is a charming book chronicling the creation and use of wax sculptures of embryonic forms. These are the first attempts to convey embryonic development in three dimensions and the fore runners of the computer-based reconstructions we use today. Wax modelling came to prominence around the1800s and was used to teach anatomy, but also to amuse and shock, as with the exhibition of guillotined heads shown shortly after the French Revolution at Madame Tussaud's. The earliest waxes of human embryos show only growth at intervals from a basic homunculus and only later depict development in the sense of elaborating form. So these waxes also chronicle the history of our understanding of development as a process and Nick Hopwood carefully documents this change in this generously illustrated b ook. He has clearly gone to some lengths, visiting museums and anatomy departments all over the "German lands", the birth place of descriptive and later experimental embryology.

It is here that Adolf Ziegler and later his son Fredrich pioneered modelling embryos in wax. These models were not confined to human embryos, but ranged across the animal and plant kingdom, including dog, rabbit, chick, trout, amphioxus, fly and the ovule of the passion flower, Passiflora alata. They also modelled organs in isolation, such as the heart and the eye. These could be taken apart and put back together and provided a scaled-up hands on approach to learning anatomy that is still used today.

However, the waxes were more than just teaching aids. Photographs of models from various angles appeared in scientific papers and they were presented as evidence, just as 3D animations now supplement electronic articles. This required Ziegler to interact closely with the scientists of his day and Hopwood outlines the difficulties that Ziegler faced working with the two opposing giants of the field Wilhelm His and Ernst Haekel. With His, Ziegler generated, from serial sections of the chick embryo, 3D reconstructions which included for the first time details of internal tissues. His used these models to argue that each animal had specific forms and he advocated the search for mechanical explanations for development. In contrast, Haekel insisted on

similarities between vertebrate embryos to support the idea that ontogeny recapitulates phylogeny. Hopwood gives a real flavour for the issues of the period, with Haekel a showman and Darwinian Evangelist finally being accused of fraud by the quiet, but determined His (whose sculpted hand is shown here. Image courtesy of "Anatomical Museum, University of Basel").



This book is an enjoyable read for embryology enthusiasts and it is reassuring that this phase of our exploration of embryonic development has been documented before wax models are lost altogether from our anatomy classrooms. These waxes were created at a time of real public involvement in science; popular articles on embryology appeared in family magazines and amateur scientists flocked to the seaside at weekends to identify new vertebrate ancestors. This period of public fascination with embryos is refreshing to re-visit and it rekindles that sense of awe which lies at the heart of developmental biology.

Kate Storey, Dundee

Genetic Destinies

Peter Little
Oxford University Press, 2002
ISBN: 0198504543 (hardback) £18.99

In his first popular science book, Prof. Little provides us with his thoughts on our current knowledge of genetic science in an accessible and forthright manner. Sound familiar? That may be because there is now a considerable choice of books covering a similar subject aimed at the educated layman, so how does this effort compare? Well, quite favourably.

The book works within the conceptual framework of a future history. Little opens with the biography of a woman born in a utopic future, who will live her life free of suffering due to advances in genetic medicine. Then he contrasts this with an altogether different future history, where genetic advances foster discrimination and oppression. The main body of the book is spent outlining the current state of our genetic knowledge, before returning to discuss the likelihood of each future scenario coming true.

The core of the book is a delightful read. After a sound introduction to the basics of DNA and genetics, we are taken on a diverse journey through the subject field, stopping here and there to learn from specific examples of genes and their effects. Little adopts a strict no-jargon policy (describing transcription factors as 'gene regulators' for example) and provides a 'Yrassolg' for those interested in translating back to the technical terms. While this is probably makes it more accessible to the non-specialist, it can be frustrating for those au fait with the language of genetics!

The future histories are a little more frivolous, addressing some of the more fanciful applications of current genetic technology as suggested by science fiction writers and the popular press. However, as a concept it allows Little to highlight the important (and often misunderstood) difference between the possible, impossible and the improbable. He also uses it to maintain focus, concentrating on human genetics and relating examples back to five central themes: the genetics of development, diversity, health, intelligence and behaviour. Furthermore, the dystopic future history provides the opportunity to tackle controversial issues. The roles of genes in defining race, sexuality and IQ are all discussed in depth. While this should be applauded, it also leads to my one major criticism. In his eagerness to explain why some experiments are flawed or indeed morally wrong, Little indulges in over-lengthy sermons, firstly on the merits of twin-studies versus case/control and then on the dangers of human experimentation (specifically with regards to gene therapy). These diversions are distracting, and temper the flow of an otherwise fascinating read.

The short but thorough section on development deserves special praise. In non-technical language, Little illustrates the importance of cascades, signalling, positioning, division and fate. Each process is described simply, while still conveying the immense complexity of the developing body. Scientists considering writing developmental biology texts for non-experts would do well to take notes. In conclusion, Genetic Destinies would provide an entertaining introduction to human genetics for undergraduates and I will certainly recommend it to non-scientists with an interest in the field.

Darren Logan, HGU, Edinburgh

Books for Review

To prevent the overcrowding of my bookshelves, I am no longer asking publishers to send me books for review unless specifically requested. Instead, I get regular updates on potentially interesting books that are released and many of these are listed below. If you would like to review one of these, or if you know of other new releases that you think should be reviewed in these pages, please contact me (a.j.furley@sheffield.ac.uk) and I will arrange for a copy of the book to be sent to you. *If* you then review it, you get to keep it (otherwise we send the boys round).

•• denotes books I would *really* like someone to review.

Blackwell Science

Gene Transcription: Mechanisms and Control, White 0632048883 £29.50

Cambridge University Press

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Lewis I. Held Jr
Series: Developmental and Cell Biology Series, No. 39
http://uk.cambridge.org/order/WebBook.asp?ISBN=0521584450

Cold Spring Harbor Press

••Manipulating the Mouse Embryo: A Laboratory Manual, 3rd Edition (Dec 2002) 0879695919 £85
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Proteins and Proteomics: A Laboratory Manual,, Richard Simpson (Dec 2002) 0879695544 £129

DNA Microarrays: A *Molecular Cloning* Manual, David Bowtell & Joseph Sambrook (2003) 0879696257 £92

I Wish I'd Made You Angrier Earlier: Essays on Science, Scientists and Humanity 0879696745 £11
Max Perutz. Paperback expanded second edition due Dec 2002

Columbia University Press

••The Dream of Eternal Life: Biomedicine, Aging and Immortality, Mark Benecke* 0231116721 $27.95

Harcourt Press

Mouse Development, Rossant/Tam (due March 2002)

Oxford University Press

••Patterning in Vertebrate Development, Cheryll Tickle (Nov 2002; paperback) 0199638691 £40.00

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(to be published in January 2003)

••Life Beyond the Gene, Steven Rose (*to be published in 2003*) 019515039 £TBA

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