BSDB Newsletter

British Society for Developmental Biology

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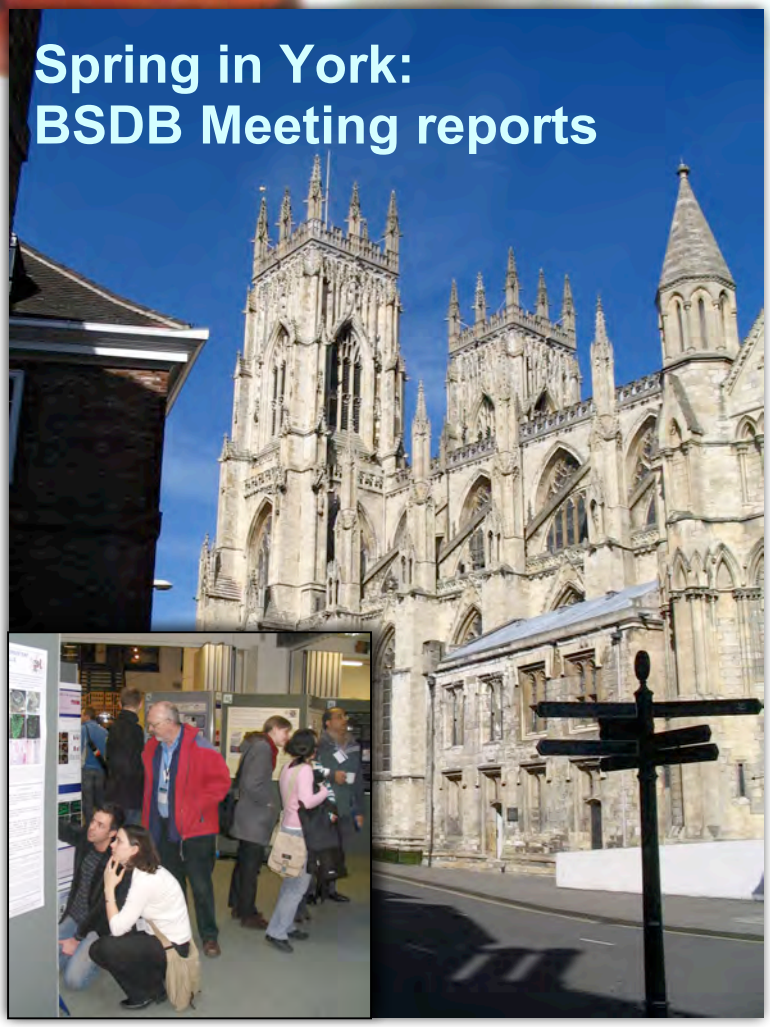
Spring in York: BSDB Meeting reports



Profile: RIKEN Centre for Developmental Biology

How RSS can change your life

Also in this issue:

Editorial

As developmental biologists, we all know that importance of feedback. Well, the same goes for this newsletter! Don't hesitate to shout if you want more of certain articles (or less of others).

The newsletter of course survives largely through the willingness of members to write for it. In general I've been gratified with the level of enthusiasm shown when members are approached to make contributions. This is particularly true of graduate students and post-docs, who have required very little arm-twisting to do their bit for the community. They've also shown an impressive adherence to deadlines, which puts the rest of us to shame.

Developmental biologists are no strangers to technology in the lab, but are we making the most of the latest communications technology? Such as RSS? If you've no idea what I'm talking about, then Ian Simpson's article is for you. Even for those for whom this isn't double Dutch, his article should provide many useful pointers. Along similar lines, Raphie, our grad student rep, has set up a Facebook for BSDB student members. Will you rise to the challenge and use it?

Doug Sipp has written an article introducing the RIKEN Institute in Japan. An impressive institute in an exotic location: surely this will tempt some prospective post-docs from the UK. I hope this article will become the first in an occasional series profiling research institutes.

With all the current hype around the Da Vinci Code, we have a rather topical short story in the Velasquez Code, submitted by Luc Mathis. This is a bit of an experiment for the newsletter, but it seemed like a bit of fun to me.

Finally to return to the theme of feedback: Hypogaeus would like some feedback on the riddles set last time? Did you get them all? Were they too easy? Did you bother?

Andrew Jarman, Editor

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Contents

Help us spread the word

Please print out a copy of this newsletter and leave it in a strategic place, such as your coffee room or staff room.

Coming soon!

A guide to submitting papers to online archives.

Cover image

The milkweed bug, Oncopeltus, *courtesy of Kristen Panfilio, Cambridge*

From the Chairman

"The question is: how can we make sure that the voice of biologists is heard when key decisions are made?"

Science policy. Two words that induce many scientists to turn the page, so arguably a risky start to a chairman's letter. Given the extent to which most of us are directly affected by policy decisions, it seems odd that their discussion is inimical to so many of us. Presumably a combination of scepticism about policy makers and their motives, a desire to remain focused on science itself, and a sense that there's not much we can do anyway, underlies this widespread lack of interest.

Yet none but the most hard-boiled cynics would dispute that many policy issues are critical to the wellbeing of biology. There are the grand universals like the ethics of animal experimentation, cloning and stem cells or how (or indeed whether) science should take account of society's aspirations; there are the more obviously political decisions of how much should be spent on research and higher education or how to translate inventiveness into practical invention; and there are the more parochial, but very direct issues like career structure, salaries and grant success rates. These examples represent only a small proportion of the policy-driven issues that profoundly influence our working lives, so as a group we simply can't afford to ignore them, even if individually we prefer to get on with our experiments and leave all that to someone else.

The question is: how can we make sure that the voice of biologists is heard when key decisions are made? Two primary players speaking for science as a whole are – from very different perspectives – the eminent insiders of the Royal Society, and the politically astute but non-establishment Campaign for Science and Engineering (CaSE, formally Save British Science). At the level of individual disciplines, the physicists and chemists have large and powerful voices in the form of the Institute of Physics and the Royal Society of Chemistry, respectively, but biologists have been rather slow to organise themselves into a single effective lobby. Maybe we have an anarchic streak that, while rather attractive, doesn't help in this regard.

Obviously there are many learned societies like the BSDB, and some do respond to policy consultations and lobby for their individual causes; this can be surprisingly effective when planned smartly. Realistically, however, the bigger the policy decisions, the higher in the chain it is taken, and the Treasury, for example (whose tentacles reach surprisingly far), does not have the time or inclination to consult the full gamut of specialist organisations. Conversely, we kid ourselves if we think that the BSDB and our ilk have the resources, time or expertise to be an effective lobby.

Enter the Biosciences Federation. The BSF had a rather tortuous inception but was formally founded in late 2002. It is early days, but the signs are promising that it is becoming successfully established as the voice of biology speaking to policymakers. As it begins to mature, significant issues need to be faced, including how it will fund itself, how it will represent diverse opinions and what is the appropriate scope of its activities. But the BSDB committee, like the forty or so other societies that have joined (and pay a substantial annual fee), has decided that the goal is a valuable one and for now, at least, the BSF looks like a good prospect. We will continue to scrutinise this as each year's subscription becomes due, but for now we offer the BSF the support as well as the cash of the BSDB. **James Briscoe** is the committee member responsible for the relationship and, among other things, he coordinates the BSDB response to BSF consultations relevant to developmental biologists. Later in this issue, James discusses in more detail the BSF and the consultations to which he has responded.

To finish on a more domestic note, the 2006 BSDB/BSCB Spring Meeting in York was a great success and, as always, much gratitude is owed to its organisers, who do an enormous amount. The BSDB scientific organisers were **Betsy Pownall** and **Corrine Houart**. And I make no apology for reiterating the thanks of the whole BSDB to **Nancy Papalopulu**, our indefatigable meetings secretary and **Guy Tear**, our prudent treasurer: they are responsible for the success of all BSDB meetings and that is a huge undertaking. York 2006 was the biggest spring meeting ever and developmental biologists had the added bonus that the BSCB half of the programme was focused on stem cells, which is obviously developmental biology really. Make sure you book early for Dundee in September, where the BSDB meeting on signal transduction and embryonic development looks great.

Matthew Freeman

Society news

Progress has been made on developing resources for teaching, especially at school level. David Wilkinson and Corinne Houart have produced an introductory document and this should appear on the BSDB website shortly, other deadlines willing. We would appreciate any comments, additions, corrections. Most particularly, there is now a need for eye-catching illustrations to go with the piece. Any donations of images will be extremely welcome – a very simple way for you to do your bit. Also, if anyone with web designing skills would like to get involved in creating eye-catching webpages, then please contact us.

Have your say

If you have news, letters, or comments you would like aired to the developmental biology community, please write to the Editor (andrew.jarman@ed.ac.uk)

Do your contact details need updating?

As always, it's a hard job keeping the database of the Society membership up to date. If you change your address, please remember to send us the details. You can use the online feedback form to give us this information.

http://www.bms.ed.ac.uk/services/webspace/bsdb/Bsdbfeedbackform.htm.

From the Treasurer

Financial report

I am pleased to report that increasing numbers of our members are updating their subscriptions to the amounts announced in 2004. This has increased our income and has allowed us to make more travel awards to those wishing to attend BSDB meetings. We experienced a considerable demand for our travel grants to the Spring meeting this year receiving twice the number of applications than in previous years. We provided funding to as many as we could afford spending £22,425. The continued generous support of the Company of Biologists also allows us both to subsidise the costs of our meetings and to support members to travel to meetings or courses overseas.

Again we have received a considerable demand for our travel awards to overseas meetings, more than we can afford to fund. Unfortunately I have had to limit the size of the awards that I make in order to be able to make as many awards as possible.

Members may have noticed that we have not been offering discounts on the registration fees for our meetings to our members. This was done in reaction to some financial advice we were given. We have since taken professional advice and been informed that we can once again offer members discounts to attend BSDB meetings.

Guy Tear

Good news!

"We…have been informed that we can once again offer members discounts to attend BSDB meetings"

Subscription information

Full members	**£35** per annum
Student members	**£15** per annum

Currently BSDB members pay their subscription to the Society through a standing order. This means that it is the member's responsibility to instruct their bank to increase their standing order. Please take the time to update your standing order. A form for you to complete and send to your bank is available on the Membership page of the BSDB website: http://www.bsdb.org. The Society is pushing forward with plans to collect your membership fees by Direct Debit in the future, which will allow us to more efficiently collect your subscriptions from your bank accounts.

Student members

Student members that joined the Society in 2002 are reminded that they should now upgrade their subscription to the full member rate of £35.

The future…

"The Society is pushing forward plans to collect your membership fees by Direct Debit…"

Travel grants

Warning!

Only members paying the correct subscription to the Society will be eligible for a Travel Grant

BSDB Spring and Autumn meetings

These are the only UK meetings for which there is BSDB support. Grants cover cost of registration (but not conference dinners) and basic travel if funds permit. Currently we are receiving more applications than we can fund in full and preference is given to members who present posters. BSDB members based abroad are eligible for a contribution (max. £400) to attend our meetings. All applications for travel grants to attend BSDB meetings MUST be in the hands of the Treasurer by the published deadline.

The deadline for Spring Symposium 2006 is 31 May 2006

Overseas meetings

There is considerable demand for funds to travel to meetings overseas. Applications are collected each month and a decision on awards made at the end of the month, with funds awarded according to the remaining budget. To allow us to fund as many applicants as possible we are currently limiting awards to a maximum of £300. The total amount needed is taken into account when deciding the amount of the award; however those artificially inflating their request will be penalised. Preference is given to members presenting work at the meetings.

Practical courses

The BSBD will also provide funds up to a maximum of £400 for members to attend courses or to visit laboratories overseas. These applications are considered alongside those for overseas meetings.

Applying for a travel grant

Members should complete a Travel Grant Application form and send it to the Treasurer. Forms can be downloaded from the BSDB website: www.bsdb.org **.**

Applications for overseas meetings are advised to be submitted 3-4 months in advance so that the BSDB contribution can be used as a lever to prise the rest of the money from other sources. Grants will NOT be awarded in arrears.

Please note: Nobody will be awarded more than one travel grant per year for an overseas trip. No more than two people from one department or one person from a group will be awarded a grant to a particular meeting.

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.

Seed funding for small meetings

Members may approach the Treasurer for seed funding to help with organising developmental biology events (e.g. 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.

Using PayPal

As introduced in the last newsletter, it is now possible to pay your subscription by PayPal. This facility is primarily aimed at our overseas members. The process is fairly painless and full instructions can be found on our webpage.

http://www.bms.ed.ac.uk/services/webspace/bsdb/BSDBpaypal.htm

The Graduate Students' Section

Student events at Spring 2007 meeting

At the Spring Meeting in York this year, I organised a students' Social Event, completely with nibbles and drinks, with help from PJ Burks. At the next BSDB Spring Symposium (29 March to 1 April at Heriot-Watt University, Edinburgh), we would like to organise Student Talks during a lunch break. Talks *by* students, *for* students. This would be an opportunity for us to practice our presentation skills, get feedback from fellow students, find out more about other people's research and of course network and meet friends. For this I need YOU. Please email me ASAP if you would like to becoming involved in this initiative.

Raphaela Kitson-Pantano, 2nd year PhD, University of Edinburgh, s9902690@sms.ed.ac.uk

Student Ambassadors

At the student social, the idea of student ambassadors was mentioned. Let me know if you would like to be a student ambassador for your University. The job would involved advertising the BSDB to fellow students, and encouraging people to write for the newsletter. Also, when conferences take place at your university, you could be my local contact person to help me organise a student social event. This would be great for your CV and it is also a rewarding activity. Please email me if you're interested (or you want to nominate a friend!).

Facebook — keeping in touch

Have you heard of MySpace, the way of making contacts and friends that's gripped the US? The academic equivalent of this 'Social Networking Website' is called Facebook. I have set up a BSDB graduate student group. So to keep in touch with student friends and to meet new BSDB student members, it's easy! Just log on to www.facebook.com. Register if you are not already a member and join the BSDB group.

Student membership rates

"If you are not paying £15 for your student membership, you're not paying the correct amount!", said our society Treasurer. Make sure you are paying the right amount or you might find you don't get that Travel Grant when you next apply!

Writing for the newsletter

Why not submit something to the newsletter? If you wish to remain anonymous about your easy tips and your stories, let me know, but in all cases could you please give me your name, name of institution and year of study.

It's up to you!

Please, please submit something. If you wish to remain anonymous about tips and stories let me know but in all cases could you please give me your name, the name of your institution and your year of study!

Tip of the day

When designing primers for a protein expression construct, don't forget to include a stop codon at the end.

Questions? Complaints?

Is there anything you would like me to raise for you at Committee meetings? Anything you would like to discuss? Don't hesitate to tell me: s9902690@sms.ed.ac.uk

Unbelievable but true!

I had only been in the lab a few days when I set fire to a beaker of ethanol. (V. Schulten, 4th year)

Claudio Stern: worthy Waddington medallist

"…there is an extraordinary resonance between Claudio Stern [left] and his scientific hero, Conrad Waddington". Medal awarded by Matthew Freeman at the BSDB Spring Meeting

One of the nicest things about being chairman of the BSDB is the opportunity to present the Waddington Medal. This is the main honour awarded by the BSDB and is given for outstanding achievement in developmental biology.

Even in an era where scientific specialisation was less pronounced than now, Conrad Hal Waddington was a true polymath, publishing papers in palaeontology, population biology, evolution, genetics, growth, cancer, biochemistry, biophysics, theoretical biology, maths, ethics, philosophy and, of course, developmental biology. He had a huge influence on the course of developmental biology in the mid part of the 20th century, and his life work has been described by a Waddington scholar as a quest for a unifying theory of life. If this sounds a slightly quaint and unrealistic ambition to us, we should be under no doubt that his work on embryonic induction, developmental competence, epigenetic landscapes, canalisation and left-right asymmetry, to name just a few concepts that he either introduced or developed significantly, remains hugely influential thirty years after his death.

This year's Waddington Medal, was awarded, very fittingly, to the Waddington scholar to whom I just referred: someone who has collected and read most if not all of Waddington's output and who has also published on Waddington's science. But most of us know him differently: as the highly successful and influential embryologist Claudio Stern.

Claudio's achievements are manifold. The cellular and molecular basis of neural induction in the chick is a central focus of his work but he has also worked on primitive streak formation, somitogenesis and segmentation of the forebrain. Another major long-term theme has been gastrulation. In all these areas, what he has done so successfully is to exploit molecular techniques to illuminate questions of classical embryology. Claudio's profound knowledge of this earlier work separates him from many others who have not bothered to appreciate its full richness and significance.

Claudio was born in Uruguay and moved to Britain as an undergraduate at Sussex. He then did his PhD with Brian Goodwin, who himself had studied under Waddington. The Waddington theme continued as he moved to UCL as a postdoc with Ruth Bellairs, herself a former student of Michael Abercrombie, one of Waddington's important collaborators. After a brief stint at Cambridge, Claudio became a lecturer in the Anatomy Department at Oxford and then from 1994 to 2001 was head of the Department of Genetics and Development at Columbia in New York, before returning to be the JZ Young Professor and head the Department of Anatomy and Developmental Biology at UCL.

As well as scientific achievement, the Waddington Medal recognises contributions to the community and, on this front also, Claudio has an exceptional record. He is the Editor of Mechanisms of Development and its sister, Gene Expression Patterns, and he was the central figure in re-establishing a financially advantageous relationship between Elsevier and the ISDB. This money goes to support the 4-yearly ISDB meeting but also national developmental biology societies, especially those in scientifically less developed countries.

Outside the lab, Claudio is a gastronome with what has been described as a somewhat Hercule Poirot-like attitude to a menu and a good restaurant. Fittingly then, when a lecturer at Oxford he was made responsible for choosing the daily high table menus at Christchurch. Those who know how seriously Oxford dons take their food and drink, will appreciate the magnitude of this task.
(Continued overleaf)

Spring Meeting poster prize winners

First prize: ***Atsuko Sato****, Peter Holland lab*

Second prizes:

Stephanie Bunt*, Helen Skaer lab*

PJ Burks*, Betsy Pownall lab*

Emma Greenhill*, Rob Kelsh lab.*

Claudio's intellectual achievements extend beyond embryology or even science at all. He is a past chairman of the Sussex Early Music Society and has published academic articles with such ringing titles as “On re-tuneable crumhorns” and “A brief workshop manual for recorders”. Given the chance, Claudio will debate at length whether an early engraving shows rauschpfeifes, schryaris or shawms. I know because I have read the rather devastating criticism he has published of some hapless writer who misinterpreted which of these medieval woodwind instruments was depicted. Claudio clearly brings the forensic rigour of an experimental scientist to the presumably gentle field of early music and one can’t help wondering what they make of him.

I finish with a thought that emerges from Claudio's story, and which was even more apparent from the lecture he gave in York on accepting the medal: there is an extraordinary resonance between Claudio Stern and his scientific hero, Conrad Waddington; Claudio is in many ways a natural successor to the man himself.

Matthew Freeman

“Given the chance, Claudio will debate at length whether an early engraving shows rauschpfeifes, schryaris or shawms.”

Congratulations also to Marc Amoyel (NIMR) for receiving the Beddington Medal for outstanding PhD thesis.

Four scientists in search of an author

On the evening of Tuesday 25th April, along with a Particle Physicist, Geologist and Material Scientist, I descended into the basement of a private London club unsure of what to expect. We were there as representatives of SciTalk, a project that aims to connect scientists and writers, to talk to members of PEN – the international organization of writers. SciTalk founder Ann Lackie – who was also there, had arranged the event, entitled “four scientists in search of an author” with the PEN events organisers.

It was a small, slightly sweaty room with a bar at the back and as we stood around drinking G&Ts and working out how to project all of our PowerPoint presentations onto a white brick wall (as the portable projection screen obstructed too-many of the too-few seats) 50-60 PEN members of all ages crammed in. Each of the four scientists had about 8 minutes to explain something about our science, our lives and why some subset of these things might be interesting to novelists, dramatists and/or playwrights.

We went from movies of nerve cells growing out axons and zebrafish development to the smallest units of matter being measured by the largest scientific instruments in the world, followed by the scientific detective work of Geology and finished up (to the consternation of the front row) with glass fruit bowls made of Uranium.

This was followed by an interesting, and at times passionate, question and discussion section about why we are motivated to do the science that we do, the role of creativity in science, whether fiction influences science, whether there is a link between Autism/Aspergers and scientific career choices, whether fiction can play an important role in enthusing/interesting the public about science, whether this can backfire by scaring the public about new technologies/possibilities and how accurate science should be in fiction.

It was a really interesting and interactive audience and the formal part of the evening spilled over into about an hour or so of informal discussions with people who were either just interested in talking more, and/or who had specific questions related to ideas and projects that they were already developing. Most people, myself included, left saying what a great evening it had been and how great it would be to do it again.

Kate Lewis

http://www.pdn.cam.ac.uk/staff/lewis/

*As has been previously reported in this newsletter, the main project of **SciTalk** has been the creation of a database of scientists who are willing to talk to authors. To become part of the database you need to answer some questions about your research and say what you are prepared to offer authors (e.g. visit to lab, answering questions* and/or meeting and discussing).

SciTalk: www.scitalk.org.uk

PEN: www.englishpen.org

RIKEN Centre for Developmental Biology

Doug Sipp
Manager, Office for Science Communications and International Affairs
RIKEN Center for Developmental Biology (CDB)
2-2-3 Minatojima Minamimachi

"As part of our commitment to creating a truly international research environment, the CDB has undertaken to ensure that even researchers with no Japanese language ability can work and thrive in their new home?"

In the six years since its establishment, the RIKEN Center for Developmental Biology (CDB) has rapidly grown to become one of the world's largest research centers dedicated solely to the study of the mechanisms of animal development and regeneration. Located in Kobe, Japan, the CDB is home to 30 labs focusing on fundamental aspects of induction, differentiation, asymmetric cell division, cell signaling, migration and adhesion, with particularly strong programs in stem cell biology, germline development, epigenetics and reprogramming.

This broad spectrum of interests has yielded a strong record of publications from the CDB over the course of its relatively short existence. 2004 saw the publication of investigations of translational repression in the *Drosophila* germline, cadherin function in synaptogenesis and the explication of a timetable of gene expression useful for measuring the activity of biological clocks in mice. Last year, CDB researchers reported techniques for inducing the differentiation of retinal neurons and forebrain precursors from ES cells, the molecular crosstalk underlying the first differentiation event in mammalian embryogenesis, and a novel post-translational mechanism by which cells regulate Wnt and FGF signaling, among others. Visit the CDB website (www.cdb.riken.jp) for a comprehensive overview of the CDB's research and other activities, including our most recent annual report.

Another highlight of working at the Center is the fullness and diversity of its meetings calendar. Every year, the CDB hosts 80-100 seminars by leading researchers from around the world, as well as a number of more extensive, themed meetings held on an *ad hoc* basis. The highlight of the events schedule is the Annual Symposium, a 3-day conference held every spring in the 144-seat CDB Auditorium. Next years Symposium, on the theme of "*Germ Line versus Soma:Towards Generating Totipotency*," is being co-organized by Azim Surani of the University of Cambridge, and we look forward to welcoming many participants from the UK and other countries in March next year.

As part of our commitment to creating a truly international research environment, the CDB has undertaken to ensure that even researchers with no Japanese language ability can work and thrive in their new home. A range of support is provided to non-Japanese staff and their families, including assistance with apartment-hunting, visa processing, medical issues, childcare and education. At present, approximately 8% of the CDB research staff are from overseas, including two PIs (Tony Perry and Raj Ladher) hailing from the UK, and a third (Guojun Sheng) who spent several years in London as a postdoc prior to coming to Kobe. Additional information about living in Japan and working at the CDB can be found at: http://www.cdb.riken.jp/discovery/. All job openings are posted on the CDB website.

The CDB seeks to contribute to the international developmental biology community at the institutional level as well, and is now proud to provide administrative support to the Asia-Pacific Developmental Biology Network (www.apdbn.org), the Asian Reproductive Biotechnology Society (http://www.cdb.riken.jp/arb/), and the International Society of Developmental Biologists, following the election of CDB Director, Masatoshi Takeichi, as ISDB president. The next ISDB Congress will be held in Edinburgh in 2009, and we look forward to seeing a strong turnout from both Japan and the UK to what promises to be an excellent meeting.

We hope you'll take some time to visit our website to find out more about our latest activities and publications, and feel free to send me any inquiries you might have. We look forward to continued close relations colleagues in the United Kingdom at the individual, lab and institutional levels.

Doug Sipp

Coalition for Medical Progress

Last year David Taylor, a private individual with no personal links to medical research, approached CMP with an outline idea for a mechanism whereby ordinary people like himself could register their support for medical research involving animals.

As CMP's remit is to reach as wide an audience as possible with information on why animal research is essential for medical progress, we saw this project as an excellent opportunity to reach new audiences with our messages and provide the 'silent majority' with a way to stand up and be counted.

After several months of development, The People's Petition is ready to launch and we need your support to make it a success.

The People's Petition is a website, www.thepeoplespetition.org.uk, which encourages people from all walks of life to 'sign up' to three simple statements:

1. I believe that medical research is essential for developing new medical and veterinary treatments. I understand that finding safe and effective treatments and medicines requires some studies using animals.

2. I believe that medical research using animals, carried out to the highest standards of care and welfare, and where there is no alternative available, should continue in the UK.

3. I believe that people involved in medical research using animals have a right to work and live without fear of intimidation or attack.

Unlike a traditional petition, we do not plan to send the signatories to anyone, nor will the signatures be visible on the site. Individuals will be able to sign up by registering a first name and town of residence, plus a valid email address, all of which will be stored centrally and privately. The website will then give a running total of the number of people who have signed up. Visitors to the site will have the opportunity to submit comments. These will be monitored by CMP and we shall choose which comments to post on the site.

There is also a 'Send to a Friend' function, which we believe will be very important as we work to disseminate information about the site as widely as possible.

As you would expect, we have had the site rigorously tested to ensure that it cannot be hacked or abused.

We will be launching The People's Petition on Wednesday 19 April, with a media briefing for the national press in London. Before that public launch, we want to gather a significant number of signatories on the site and we are now asking for your help to achieve that. We hope that you will be willing to distribute, to your employees and other contacts, information and details of how to access the website, which will be password-protected until 19 April.

We shall circulate the access details to you on Tuesday 18 April and would be extremely grateful if you could then circulate them within your organisation on that day.

It would also help to swell the numbers of people visiting the Petition site if you could link to it from your own website. We realise that this may take a little time to set up, but we would be delighted if as many CMP member organisations as possible could link to the site.

I am sure you will agree that the People's Petition will be a great asset in giving a voice to all those who support medical research as well as all of us working within it. Please help us to make it as successful as possible.

Thank you for your continuing support for CMP.

Yours sincerely

Colin Blakemore
Chairman
Coalition for Medical Progress
info@medicalprogress.org

It is quite likely that most of you will have heard of the Coalition for Medical Progress, since they received widespread publicity, and even support from the Prime Minister. For any BSDB members who are interested, here's the letter from Colin Blakemore that was widely circulated earlier this year.

www.thepeoplespetition.org.uk,

The Biosciences Federation: influencing government on your behalf

James Briscoe, BSDB BSF representative

The BSDB is a paid up member of the Biosciences Federation (BSF) an organisation which aims to influence policy and strategy important to biology-based research. Over the last year the BSF have lobbied the government for more research funding and better use of existing funds, as well as explaining to the powers-that-be the impact of legislation and regulations on our ability to teach and do research. Rather than individuals, the membership of the BSF is made up of learned societies, these cover the full range from the big societies like the Biochemical Society to the rather more niche such as the British Lichen Society. However, each has an interest in the biosciences and being represented by the BSF should give us all a voice that can be heard by decision makers.

"The BSF … is beginning to build a reputation for itself, contributing to government and research council consultations as well as being asked to give evidence to Commons Science and Technology Committee inquiries."

The BSF was founded in 2002 and is beginning to build a reputation for itself, contributing to government and research council consultations as well as being asked to give evidence to Commons Science and Technology Committee inquiries. The BSDB has played its part in this, offering our opinions when relevant, for example to the MRC consultation on funding stem cell research and the OST consultation on how research is funded in universities.

As Matthew mentions in his letter, the BSDB believes it is important to continue to make our opinions known and have our views represented when changes that affect our work are being contemplated. Over the next few months the consultation on the Single Health Research Fund is expected to take place. This follows the proposal by Chancellor Gordon Brown to strengthen medical research by establishing a single budget for the Medical Research Council and Department of Health R & D. The BSDB, through the BSF, will contribute to this and anyone with thoughts or opinions should direct their comments to James Briscoe (jbrisco@nimr.mrc.ac.uk) who acts as our Society's representative to the BSF. Of course, members with views on the Chancellor's proposals should also make them directly to the consultation, but by working through the BSF we hope to give extra clout to the opinions of bioscientists, particularly developmental biologists.

The BSDB regularly reviews its membership of the BSF and the committee would be interested in hearing what you think. Anyone wishing to find out more about the work of the BSF should visit http://www.bsf.ac.uk/ which contains information on their current projects. In addition the BSF produce a regular newsletter that succinctly summarizes science policy news and upcoming events – current and previous editions can also be found on the website.

James Briscoe

Information to go: feeding your hunger for the latest in science with RSS

Ian Simpson
University of Edinburgh

The last few years have seen something of a revolution in the way in which news can be delivered to users from vastly disparate sources via the Internet. At the centre of this is RSS (Really Simple Syndication) a markup language that is a specialisation of XML (eXtensible Markup Language). An RSS page is on the face of it just like any other web page, but it is coded in a way that allows it to be rapidly and dynamically updated. By using web or desktop based monitoring tools (of which more later) you can poll the RSS "feed" for the latest content. The more observant of you may have spotted RSS icons appearing all over news sites such as the BBC, CNN and Reuters, but they have also popped up at places like Nature, PNAS, Cell Press and PubMed. So why is it that many of the larger scientific publishing houses have turned to RSS? The aim of this article is to explain why RSS is something that you should be aware of and also how to begin using it simply and quickly.

Why do I need to know about RSS?

For me the answer was very simple; eTOCs (electronic Table Of Contents). As many of you will know scientific journal sites generally offer the opportunity to subscribe to a service that will send an e-mail containing the latest table of contents for an issue of a journal. In days gone by this was a very convenient and dare I say lazy way of keeping up to date with the latest journals and as I am sure many of you will agree suffers from a number of problems. Firstly, they do tend to build up. A lot. Secondly, if you want to cancel or amend your subscriptions you have to remember user names, passwords and web addresses assuming that they haven't changed since you signed up several years ago. Thirdly they are entirely static and vary massively in content and style between journals. With the ever expanding number of titles, the arrival of the eTOC became less like a welcome time saver and more like a never ending stream of junk mail filling my Inbox. In recent years the eTOCs have been unsubscribed from and relative peace has returned. So how do I now keep up to date with the latest journals? Do I brace myself against the weather and stride out to the University library? Do I navigate to each and every journal web site that I want to check and read the contents there? Not at all. I use RSS.

RSS adoption

Key to the success of RSS as a means of delivering content to scientific users is systematic adoption by the major publishing houses. In recent years all but the very few have done so and for the first time keeping up to date with RSS has become a practical reality. For those journals that have not yet stepped up to the plate PubMed has added comprehensive RSS functionality that allows you to build RSS feeds for them. It remains true, however, that the most up to date and best quality eTOC content is delivered directly from journals own RSS feeds. In practical terms I have set up my RSS reader to read direct RSS feeds from all of the journals that I am interested in monitoring and used PubMed to fill the gaps of the one or two that haven't yet implemented RSS.

Setting up RSS by example

1. Capturing a journal RSS feed at Bloglines.com

Navigate to the Bloglines website (http://www.bloglines.com) and register with a valid e-mail address. The site will send you an e-mail containing a link that you need to click to validate your account. This will also open up a page with you logged in to Bloglines for the first time. Clicking the "My Feeds" tab takes you to your feed display page from which you can configure everything you need to get your RSS feeds set up. In this example we are going to add a feed for the eTOC of the latest issue of Nature. Navigate to the Nature homepage and click the "live news feeds" link on the right hand side of the page (http://www.nature.com/nature/newsfeeds.html) once there copy the address of the link to the latest issue eTOC (http://www.nature.com/nature/current_issue/rss) . On your Bloglines feed page in the left hand frame click the "add" link. A box will appear in the main frame of the page labelled "Blog or Feed URL:". Paste the Nature RSS URL that you copied just now into this box and click the "subscribe" button. You can now configure how your feed will be displayed which you can change at any time (see Bloglines help for details) or accept the default. In our case we are going to accept the default by clicking the "subscribe" button. Your Nature eTOC RSS feed has now appeared in the left hand frame in your list of feeds. Click on the "Nature" link in the left hand frame and the eTOC appears in the main frame.

(Continued overleaf)

"The aim of this article is to explain why RSS is something that you should be aware of and also how to begin using it simply and quickly."

"RSS has been embraced by the scientific community in the last few years and delivers customised information efficiently saving you a huge amount of time and effort."

In the next issue I'm hoping to run a similar article on podcasts, assuming I can find a volunteer to write it… Any offers?
The Editor

2. Capturing a journal RSS feed at PubMed

RSS feeds can be generated for any search you can do at NCBI, but what we are going to do here is create a feed for the journal Development. Navigate to PubMed (http://www.ncbi.nlm.nih.gov/pubmed). In the search box type "Development[journal]" (do not include the speech marks) and click the "go" button. The results should display the newest first only articles from Development. In the pull-down menu labelled "send to" select the RSS feed item in the menu. The page will refresh and ask you how many items you want to limit the feed to (each issue of development has around 30 items but I select 50 to be on the safe side) and you can rename the feed if you want. When you are finished click the "Create Feed" button. You will be presented with a page showing an XML icon from which you should copy the URL (typically right-click and copy). Now you proceed exactly as in our example above to copy this URL into a new Bloglines feed.

It is important to note here that this PubMed feed is not equivalent to an eTOC, unlike the Nature example above. It is a feed of the latest Development articles as they appear on PubMed. It so happens that Development pass the information to PubMed at the ePub phase so your RSS feed will be even more up to date than an eTOC of a journal issue. This is not the case for all journals and so for a few of the less widely read journals it may be that the PubMed feed could lag behind the eTOC on the journal web site.

Which tool to use?

The decision on which of the many RSS readers to use depends on ease of use and functionality. There are many reviews available on-line to help, but a list of popular RSS readers is given for all platforms in the "Useful Links" section below. I have illustrated the examples here with Bloglines primarily because it is simple, web based and widely used. I recommend it as a great place to start and if you find RSS is really your thing then you might consider trying some of the more feature rich desktop applications such as NewsCrawler (Windows), NewsfireRSS (Mac) or Akregator (Linux).

The power of RSS in science

It is clear that the potential uses for RSS go beyond the eTOC. Even looking at the last example it is easy to see that complex custom searches in PubMed can be rendered to RSS feeds to allow you to keep a hawkish vigil over anything that might interest you. RSS is being used increasingly to distribute information on scientific jobs, conferences and product releases in addition to the more obvious journal based content. New uses are emerging constantly including for example the ability to get citation data through RSS feeds via the new Elsevier Scopus site (http://www.scopus.com).

RSS has been embraced by the scientific community in the last few years and delivers customised information efficiently saving you a huge amount of time and effort. Hopefully this article will encourage you to try it out if you haven't already and if nothing else help to clear that inbox.

Ian Simpson

Wikipedia entry on RSS http://en.wikipedia.org/wiki/RSS_(file_format)
BBC guide to RSS http://news.bbc.co.uk/1/hi/help/3223484.stm
RSS tools
http://dmoz.org/Reference/Libraries/Library_and_Information_Science/Technical_Services/Cataloguing/Metadata/RDF/Applications/RSS/News_Readers
Popular Desktop RSS software
Windows
NewsCrawler http://www.newzcrawler.com
FeedDemon http://www.feeddemon.com/feeddemon/index.asp
Mac
NewsFire http://www.newsfirerss.com/
NetNewsWire http://ranchero.com/netnewswire/
Linux
Akregator http://akregator.sourceforge.net/
Popular Web based RSS sites
Bloglines http://www.bloglines.com
Newsgator http://www.newsgator.com/ngs/default.aspx
PubMed http://www.ncbi.nlm.nih.gov/pubmed
PubMed Help http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=helppubmed.chapter.pubmedhelp
(see section: Saving and E-mailing Results and Searches)

The Velasquez Code

A Short Story by Luc Mathis, Paris

Inspector Adele Cassis is investigating the mysterious case of a young man found dead in the Prado Museum in Madrid. While attending a seminar in which human myths are explained through the successive steps of embryonic development – fertilization, morphogenesis and differentiation – she pieces together a theory that leads her to discovering a terrible truth. Hidden in the Velasquez painting, Las Meninas, a dreadful secret lurks, just waiting to be unveiled to the world by a powerful scientific organization!

1. Fertilization

It was 2 pm and Inspector Adele Cassis was seated in the conference room of a tiny hotel situated on the Brittany coastline. Adele was a gorgeous, thirty-four-year old brunette. She had just flown in from Madrid where she was leading an investigation into the case of a mysterious teenage death in the Prado Museum. The young man had set about slashing the famous Las Meninas masterpiece with a knife, yet, had been discovered dead moments later when the security guards arrived to restrain and arrest him. Surprisingly, a thorough medical examination was unable to ascertain even a hint of a cause for this sudden death. The case felt completely uncrackable.

Hoping to take her mind off the stresses of this apparently fruitless investigation, Adele Cassis had decided to attend a seminar in psychology attractively named “Re-Birth”. Professor Edouard Morel, a tall, burly man in his early forties was the main speaker. He was standing in front of a white projection screen waiting for the room to quieten down. Through a large window just to his left, Adele could make out the white, billowing sails of a boat passing by. Her thoughts were beginning to float into the distance too on this warm afternoon, when Prof. Morel took the microphone and started to talk, startling her out of her daydream. Yet, his charismatic voice, which literally oozed confidence, immediately made her sit up with interest.

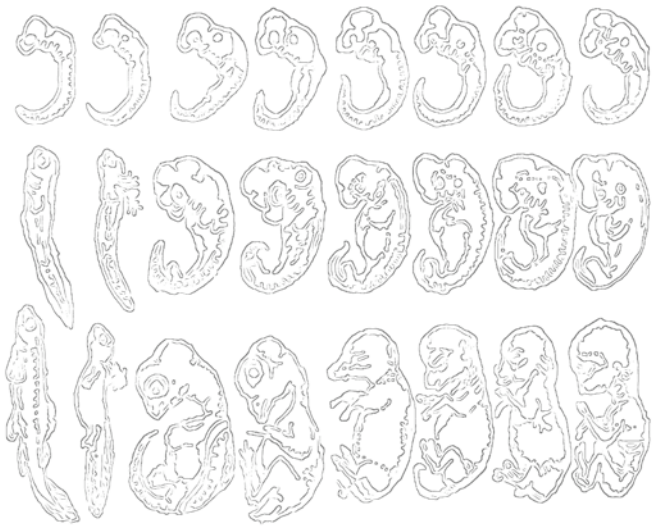
“Good afternoon ladies and gentlemen. My extensive research has led me to realise that many mythological conflicts, such as the Oedipus complex and Narcissism, are in fact imprinted in the very way we are conceived as human beings. I believe we can access our sense of self by focusing on our biological identity and our origins. I have founded this new approach designed to help you evolve, grow and self-actualize. My aim is to assist you in overcoming inner conflicts that prevent you from living your life to the full.”

Morel swung around and pressed a key on his laptop. A giant sperm began wriggling across the screen behind him and attempting to enter an equally enormous ovum. He smiled proudly.

“I am sure you all know all about your primordial identity. A cell called an egg which is the result of the fusion of an ovum and a sperm. So far, so clear? Well, let me tell you something you may not know; the process of fertilization is at the very origin of your Oedipus complex. The famous triangle is all here you see; your father and mother’s gametes and you, the egg of course. And here’s where it becomes tricky because the sperm and the ovum are from your parents and yet they are in fact already you! So these two elements come together and form an egg. And the egg looks pretty much like the ovum doesn’t it…whereas the sperm has apparently been eaten up it seems. So ladies and gentlemen, I put it to you that by coming into being, by generating the egg, you have in fact killed your father and had sex with your mother, like in Sophocles’ tale.

After fertilization, your father’s genome, carried by the sperm, has combined with your mother’s genome. Remember the genome is made up of chromosomes carrying the genes, the basic unit coding for the cell’s vital constituents. In the egg, and in each of the cells in your body, your parents’ chromosomes keep their respective individuality but they wind around each other like perpetual lovers. It’s a reassuring feeling to know that the sexual act celebrated by your parents is so deeply anchored and lives on within each and everyone of your cells, don’t you think?”

Adele Cassis admitted that this idea was indeed an appealing one for her. Since her parents’ divorce when she was twelve, she had always wondered if she had been really wanted. Morel looked around the room and was pleased to sense that the audience had been captivated by his revelations.



2. Morphogenesis

Morel pressed the key on his computer again. The next slide was a curious arrangement of small embryos. Those in the top line all looked alike, while those at the bottom of the screen showed recognizable young animals, from fish to human beings. Adele thought the tortoise was the cutest thing she had ever set eyes on!

"Like the events of your life, each step in the development of an embryo is responsible for determining the following one."

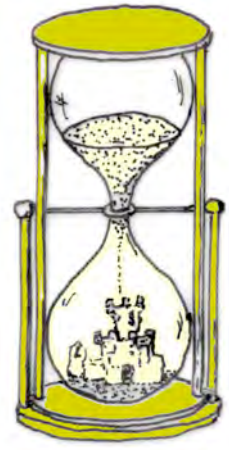
"Many people believe that fate governs their lives. In fact, not everything is written in advance. Like the events of your life, each step in the development of an embryo is responsible for determining the following one. The first steps consist of changing the round egg into an elongated body. The trunk grows up from the cluster of cells produced by the first divisions of the egg. The result, as you see in the first row of figures is a rough version of the body; sketched in the same ways as a classical painter first draws a draft outline of a model, without going into too much detail. Now the million-euro question; what is the model used by the developing embryo?"

Adele Cassis gave out an involuntary shriek of surprise when the Las Meninas painting appeared on the screen.

"In his masterpiece, "Las Meninas", the painter Diego Velasquez is looking directly into your eyes. This creates the strangest feeling that you are the model being portrayed in the large canvas on the left. But, in searching for your reflection in the mirror at the back of the room, you can only make out a couple. This gives you a hint, because although you are not the mirror image of your parents, you are the flower born of the metamorphosis of their genomes.

Your body's blueprint is in fact recorded in your chromosomes. Let me explain. As cells differentiate to form the range of body tissues and organs, they express different genes in order to acquire their identity. The positional information genes determine which element of the body – be it the head, arms, legs, heart or sexual organs - will develop at a given location in the embryo. The order of positional information genes along the chromosomes reflects their expression along the body axis. This representation of the body coded in the chromosomes is the very image of himself that Narcissus would see, looking into the mirror of his genome.

But each cell division is also like the ticking of a clock. The body becomes mature while its image in the genome remains unchanged; the beauty of Narcissus' reflection doesn't fade. The clock measures time during development, synchronizing growth and positional information along the body axis. The representation of self in the genome and its chronological realization by cellular divisions actually construct who you are as an individual."



Adele Cassis was moved. Call it professional or female intuition, but she had a feeling in her gut that there was a link between the dead teenager, the painting and Narcissus. She was suddenly focusing back on her investigation. She realized that seemingly unrelated pieces of information could in fact be pieces of the same jigsaw.

3. Differentiation

As Prof. Morel prepared to pursue his thought-provoking presentation, a soft voice coming from the back of the room made him freeze.

"Thank you for your beautiful demonstration, Professor. My name is Gilles Delemarre and I'm a psychoanalyst. It seems to me that you have only considered a very small fragment of the painting. In psychoanalytical therapy, we bring parts together."

Delemarre had thinning, grey hair making him look older than his age, which was probably no more than fifty. Obviously, he was more used to debating in front of an audience than Morel who, although tight-lipped, was crossing his arms in a defensive manner. Delemarre continued his assault:

"Las Meninas was primarily a portrait of the Spanish royal family. If we go beyond the narcissistic image generated by the painter and the mirror, we realize that the picture is organized around the Infante. The right side of the painting illustrates the progression to maturity. It starts with childhood represented by the dwarves, then, teenage years represented by the standing Maid of Honour. The couple represents adulthood and the man on the stairs in full light, is the symbol for maturity. The left side of the painting depicts the psychological image of the parental couple. Hidden and inaccessible, as the canvas where the King and the Queen are painted. Both intimate and remote, like their image in the mirror. The posture of the Infante, with her face turned to the left and her body slightly twisted to the right, suggests the conflict felt by the child: whether to become an adult or to remain immature and under parental influence. This is a major choice that the cells also have to face. How do they know whether they should differentiate or remain immature?"

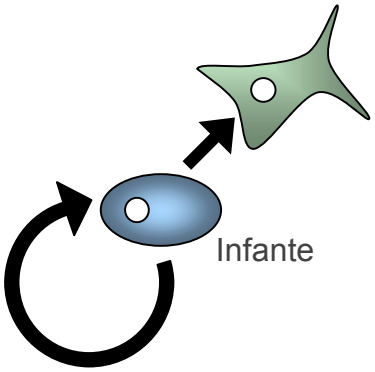
Morel looked as if his interest had been won over, although his body language conveyed he was somewhat vexed that someone appeared to have stolen his show.

"Your question is quite pertinent", answered Morel. "There is in fact a conflict, or more precisely a balance, between growth and differentiation. Many cells in the body are generated from immature stem cells. After cell division, one of the daughter cells remains a stem cell while the other differentiates."

Delemarre could no longer hide his fascination. "Do you mean that growing up requires a part of us to remain immature like a child?"

"Exactly" replied Morel. "In the embryo, organization and growth result from antagonistic tendencies. Stem cells can potentially give rise to any cell types, neurons, muscles or blood cells. But stem cells need to be taught that there are limits. Otherwise, they become cancerous, immature proliferating cells that have lost their ability to organize tissues. Stem cell proliferation is strictly controlled in dedicated niches, so that they pose no threat to the organism. "

"How intriguing!" said Delamarre. "The Infante standing between the two Meninas reproduces the division scheme of a stem cell… My friend Michel Foucault would have loved this representation of individuality! Where are these amazing cells located?"



"That's the best part", answered Morel. "Stem cells are found in many places in the body. But to repair damaged or aging organs, they must be first isolated and amplified in test tubes. The most usable stem cells are actually located in the umbilical cord!"

Delamarre stood up, a broad smile spread across his face. "Professor, I think you've found an answer to Freud's obsession. Instead of desperately try to cut the umbilical cord, we should store it away for our old age and be thankful to our mother!" He crossed the room to shake Morel's hand.

Adele Cassis literally flew out of her seat. This exchange had made her realize that one of man's most sought after secrets, the quest for eternal youth, was in fact hidden in "Las Meninas". She would go on to unveil that the Prado teenager was in fact Diego Velasquez himself, who, through his artistic experience, had been filled with the Elixir of Youth. 350 years later, perhaps weary of his immortality that he could reveal to no one, Velasquez, just like Narcissus, who had died by falling into the lake where he was looking at its own reflection, had found a way to kill himself by slashing his own picture.

Adele Cassis also realized that this terrible secret absolutely had to remain hidden. Adele's worries were only just beginning as she soon discovered a mysterious group of people acting under the cover of the powerful British Society for Developmental Biology, who wanted to divulge these secrets to the highest bidder. And as I write these lines, I am still unsure if Adele Cassis is going to be able to find a way to prevent the diffusion of the dreadful Las Meninas secret!

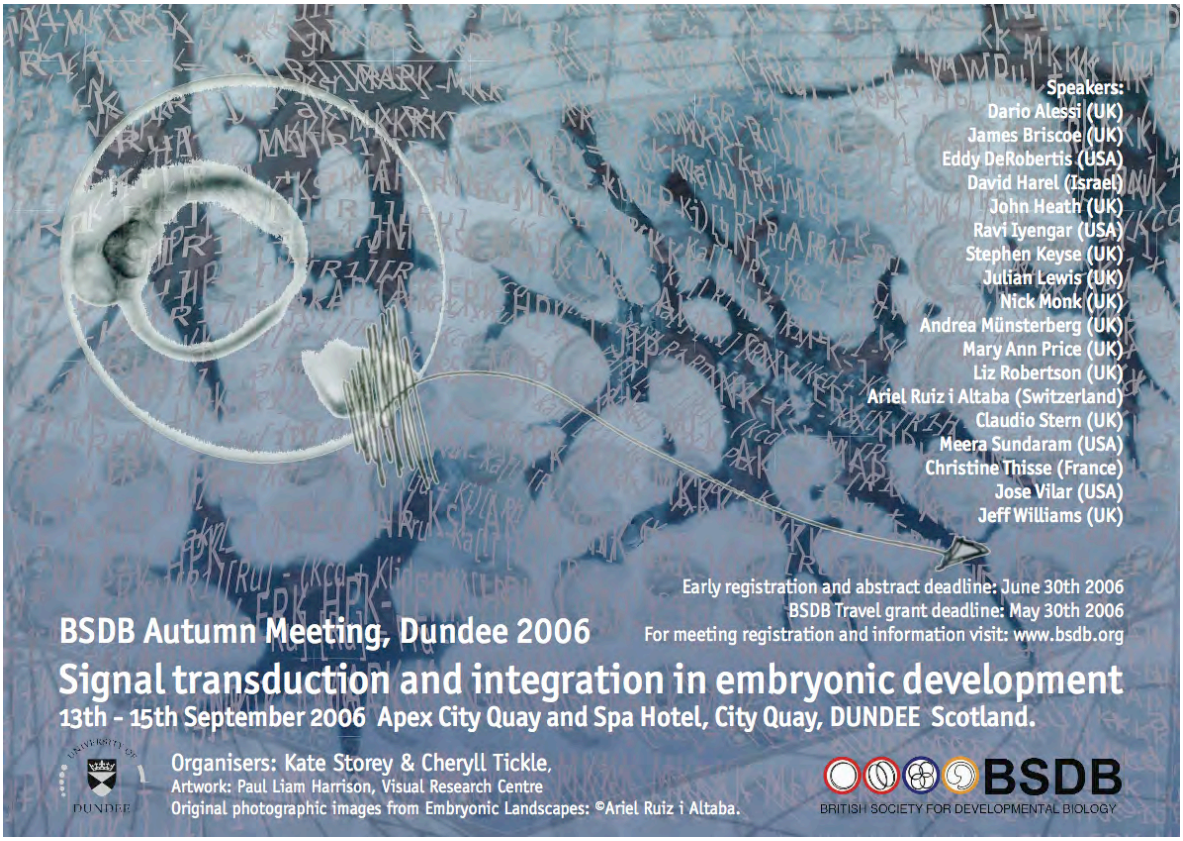
"The posture of the Infante … suggests the conflict felt by the child: whether to become an adult or to remain immature and under parental influence. This is a major choice that the cells also have to face."

"Adele Cassis also realized that this terrible secret absolutely had to remain hidden."

Sources

Michel Foucault. "Les Mots et les Choses". (The Order of Things). 1966.
Olivier Pourquié. "The segmentation clock: converting embryonic time into spatial pattern." Science 2003.
Kögler et al. "A New Human Somatic Stem Cell from Placental Cord Blood with Intrinsic Pluripotent Differentiation Potential" J.Exp.Med. 2004.
Embryo drawing based on a figure by (and with apologies to) von Baer.
Artwork credit: Las Meninas or The Family of Philip IV, c.1656 (oil on canvas) by Velasquez, Diego Rodriguez de Silva y (1599-1660). Prado, Madrid, Spain/ Giraudon/ The Bridgeman Art Library

BSDB Autumn Meeting 2006



The aim of this meeting is to explore how the understanding of signal transduction pathways illuminates developmental mechanisms: in particular, how different signalling modes and patterns can influence cell responses and how different signals are integrated. The sessions will focus on specific developmental systems in embryos from a wide range of organisms with the aim of drawing out general principles. The conference will bring together developmental biologists, biochemists and mathematical modellers.

This meeting will not be held as usual in an academic venue, but in the Apex City Quay Hotel & Spa(!) which is a recently built, very modern hotel on the waterfront.

Speakers

John K. Heath (Birmingham) “Fibroblast Growth factor signalling dynamics: *in vivo*, *in vitro* and *in silico*”

Dario Alessi (Dundee) “PDK1 signalling”

Andrea Münsterberg (UEA) ERK MAP kinase signalling in somite patterning and differentiation

Stephen Keyse (Dundee) “Roles for dual-specificity protein phosphatases in regulating the physiological outcome of MAP kinase signalling”

Ravi Iyengar (USA) “Modelling MAPK signalling” (provisional title)

Christine Thisse (Strasbourg) “Revisting the concept of the organizer and the importance of integrated signalling by BMP, nodal and Wnt8”

Eddy De Robertis (USA) “Integration of signaling pathways during neural induction”

Claudio Stern (London) “The hypoblast (AVE): multiple roles in regulating embryo polarity”

Liz Robertson (Oxford) “TGF-b signalling in the early mouse embryo” (provisional title)

Jose Vilar (USA) “Computational modelling of TGF-b Superfamily Ligand-Receptor Network”

Mary Ann Price (Sheffield) “Casein Kinase I in Hedgehog and Wnt signalling”

James Briscoe (London) “Graded signals and the control of neural cell fate”

Ariel Ruiz i Altaba (Geneva) “SHH-GLI signalling in stem cells and cancer”

Julian Lewis (London) “Feedback, oscillations and noise in the Notch signalling pathway”

Nick Monk (Sheffield) “To be announced”

Jeff Williams (Dundee) “Transcriptional regulators of Dictyostelium pattern formation”

Meera Sundaram (USA) “EGFR/Ras/ERK control of renal development in C. elegans”

David Harel (Israel) “Some Thoughts on Comprehensive and Realistic Modeling”

Future BSDB meetings

Spring 2007

Heriot-Watt University, Edinburgh, 29 March–1 April 2007

Joint meeting with BSCB and Genetics Society.

Sessions include: Protein modification; Cell growth; Ubiquitin; Biological clocks; Nuclear dynamics; Genetics of behaviour; Genomes, chromosomes and disease; Cell polarity and migration; Systems biology.

BSDB organisers: Alison Woollard and David Wilkinson.

Autumn 2007

Sheffield, 5–7 September 2007

Integrative Approaches to Understanding Developmental Systems.

Organisers: Andrew Fleming, Nick Monk, Alfonso Martinez-Arias.

Spring 2008

Warwick, 16-20 March 2008

Joint Symposium with BSCB.

BSDB organisers: Mike Taylor and James Briscoe

Autumn 2008

Seville, Spain, September (provisional)

Joint meeting with Spanish Society for Developmental Biology.

Organisers, James Castelli-Gair, Acaimo Gonzales-Reyes, Alicia Hidalgo, Robert Kelsh.

Spring/Autumn 2009

Edinburgh. 6-10 September 2009

The Spring and Autumn meetings will be subsumed in the ISDB 16th International Congress of Developmental Biologists.

Ideas for a meeting?

A major task of the BSDB Committee is to host high quality scientific meetings. We welcome suggestions for future topics for meetings or for a half-day themed session at the Spring Symposium. Contact Nancy Papalopulu

Other meetings of interest

Vascular Development Meeting

16 June 2006

Royal Society of Medicine, The Noveartis Foundation and The Physiological Society

The programme for this symposium has been organized around four main topics: the cell biology of blood vessel formation, the genetics of blood vessel formation, embryonic blood vessel formation in different animal systems, and the mutual signalling between blood vessels and tissue cells.

16th John Innes Symposium. Organisms and the environment: integrating signals and responses

19-21 July 2006

John Innes Centre, Norwich, UK

Website:
http://www.jic.bbsrc.ac.uk/events/symposium
E-mail: jic.symposium@bbsrc.ac.uk
Hugh Pelham (UK), Mario de Bono (UK); Dennis Bray (UK); Jeff Errington (UK); Susan Golden (USA); Jim Hoch (USA); Marc Knight (UK); Charalambos Kyriacou (UK); Michael Laub (USA); Rob Martienssen (USA); Scott Poethig (USA); Nigel Robinson (UK); Paul Schulze-Lefert (Germany)

14th Conference of the International Society of Differentiation (ISD)

7-11 October 2006

Innsbruck, Austria
Early registration: 14 May, 2006
Abstract submission: 30 June, 2006
Webpage: http://www.isd2006.at/

ESF-Wellcome Trust Conferences

6-10 December 2006

Hinxton, UK
Humanising model organisms to understand pathogenesis of human disease

www.esf.org/conferences

Latest meetings news

Check the BSDB website for latest meetings updates and to submit details of meetings to be advertised to members. http://www.bsdb.org

MORPHODYNAMICS

bridging the gap between the genome and embryo physics

Edited by Richard Gordon and Lev Beloussov

BSDB/BSCB Annual Spring Symposium

York, 2006

The following are reports of selected sessions at the recent Spring Symposium.

Developmental Signals

Can you imagine development without its inductive or permissive signals? I do not know if you are of the permissive or inductive nature, but sessions like the one I was induced to report on have clear fate outcomes and maintain the BSDB Spring meeting as a high point of every developmental biologist's calendar.

What a great kick-off by **Richard Harland** (Berkeley, USA), giving us a taste of the diploid frog *Xenopus tropicalis*. Its diploidy permitted the dissection of BMP antagonism and established its importance from early organizer stages in the formation of dorsal structures, which had not been yet possible to establish in other model systems. Switching gears, Richard went on to illustrate how the same signalling molecule can have opposite roles in both mesoderm formation and neural induction. FGF8 turns out to have two spliceforms (FGF8a and FGF8b) that differ in an eleven amino acid deletion. FGF8b is a potent mesodermal inducer and has little effect in neural development, while FGF8a promotes the development of neural structures and ectopic neurons.

We had then the opportunity to listen to this year's winner of the prestigious Beddington Medal. **Marc Amoyel** (London) told us about his work on the role of Wnt1 in the establishment of boundary cells in zebrafish, which in turn serve as a signalling centre regulating neuronal differentiation in the hindbrain through the expression of proneural genes. He then went on to draw some similarities with the establishment of the well-studied dorsoventral boundary in the *Drosophila* wing imaginal disc.

In a field that is flooded of animal models it was very nice to listen to two exceptional studies in plants, from **Ottoline Leyser** (York, UK) and **Enrico Coen** (see Evolution and Development session). In conceptual terms Ottoline's talk could tell us a lot about mechanisms that can account for long range signalling yet to be explored in animals. She described the MAX pathway of auxin signalling in *Arabidopsis*, where auxin long range signalling is responsible for the control of shoot branching. We learned of a mechanism in which limited capacity of signal transport from its source was important for the phenotypic outcome of the signal.

The second half of the afternoon brought Wnt signalling into the play, first in the mammalian urogenital system by **Andrew McMahon** (Cambridge, USA) and then by **David Strutt** (Sheffield, UK) using the fly. McMahon focused on the role of canonical Wnt signalling during several epithelial to mesenchyme transitions occurring in the development of the urogenital system. As Wnt9b$^{-/-}$ mutant mice do not develop a kidney, McMahon showed us that Wnt9b is both necessary and sufficient to promote pronephric and metanephric development. Moreover, Wnt9b acts upstream of Wnt4 and is a common denominator in regulating epithelium invasion of the mesenchyme at different times throughout the organogenesis of the urogenital system

Strutt started with an overview of the non-canonical Wnt signalling pathway (e.g., *frizzled, strabismus, prickled, dishevelled*) in the well-characterized *Drosophila* wing imaginal disc. He then presented us a study on the role of such signalling molecules in migratory cells and an example of how the establishment of polarity is important for migration. In the Drosophila oocyte, border cells migrate as a cluster with two central cells on top of the cluster. These top two cells establish their polarity by the use of the non-canonical Wnt pathway and in turn are required to guide border cell migration.

Ricardo Costa, Wellcome Trust/Cancer Research UK Gurdon Institute, r.costa@gurdon.cam.ac.uk

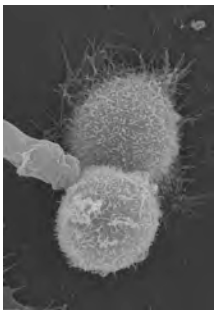
Haematopoietic Stem Cells

The HSC session kicked off with **Sten Erik Jacobsen** presenting an alternate model for haematopoietic stem cell and blood cell lineage commitment. He presented compelling data indicating that the earliest lineage commitment of the pluripotent HSC does not result in the strict separation into a common lymphoid and common myeloid progenitor as previously thought but that the LTR HSC, defined as a KSL Flt3$^{-/low}$ cell, divides asymmetrically to give rise to a megakaryocyte/erythroid (Mk and E) progenitor and a LSK CD34+Flt3 $^{+}$ HSC which maintain G, M, B and T cell potential with little or no Mk and E potential. This model fits well with the kinetics of blood lineage development in which myeloid lineage commitment precedes lymphoid in evolution, ontogeny and in transplantation experiments and also with recent HSC multi-lineage priming data.

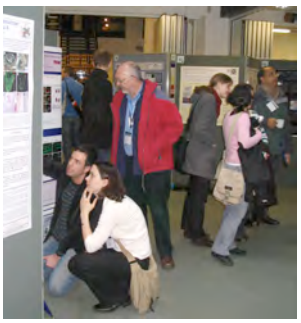
The next talk focused specifically on the role of the transcription factor c-myb in HSC development. In the c-myb knockdown there is a decrease in the total number of bone marrow cells but no change in the number of HSCs (KSL). However on closer analysis it appears that there is a reduction in the side population of HSCs, quiescent HSCs and cobblestone forming cells indicating that there is a loss of the most primitive HSCs and a phenotypic shift towards the more mature cells in the stem cell compartment. The dynamics of this process support Sten Erik's alternative model for HSC development.

The next talk moved away from mammalian systems to show how the Glia cells missing related proteins (Gcm and Gcm2) and the Runx homologue, Lozenge, function in the differention of bi-potential embryonic blood cell progenitors (prohemocytes) in *Drosophila*. The analysis suggests that the ancestral cell type produced by the prohemocyte appears to be the plasmatocyte, with expression of Lozenge promoting an alternative crystal cell fate.

"Despite the great interest and excitement that surrounds embryonic stem cells, it is surprising that we know relatively little about the mechanisms that regulate their earliest fate choices."



Scanning electron microscope image of extraembryonic endoderm (Xen) cells (Courtesy Tilo Kunath: see Kunath et al Development 132 (7))



Ana Cumano returned to the mammalian system presenting an overview of haematopoiesis in the mouse embryo, suggesting that the sub-aortic patches found ventral to the dorsal aorta may not only play a role in HSC emergence but may also be a source of HSC themselves. **Roger Patient** took us back down the evolutionary ladder to show how data from *Xenopus* and zebrafish have contributed to our understanding the origins of haematopoiesis and haematopoietic ontogeny. These model systems allow us to dissect precisely the requirement for specific transcription factors or signalling molecules during haematopoiesis using small chemical inhibitors or morpholinos. Hedgehog signalling was shown to be required for definitive but not primitive haematopoiesis and the transcription factor SCL was shown to have a critical role in the dorsal aorta formation in zebrafish. The role of Runx-1 and Tel1 in *Xenopus* were shown to be important in programming in the dorsal aorta prior to stem cell emergence in *Xenopus*.

The session was closed by **Utpal Banerjee,** who presented some beautiful data showing that *Drosophila* haematopoiesis shares a number of features with that of higher vertebrates. Haematopoiesis takes place in two distinct waves: the first primitive-like wave occurs in the head mesoderm while the second phase takes place in the larval lymph gland and provides the pupa with the haematopoietic cells it requires to progress into adulthood. He suggested that the lymph gland contains a haemangioblast-like cell, a prohemocyte niche and quiescent progenitor cells which differentiate in a manner that resemble the temporal and spatial emergence of haemtopoetic cells in higher vertebrates.

Claire Fernandez, Weatherall Institute of Molecular Medicine, Oxford

Mouse ES cells and embryo germ layer specification

Despite the great interest and excitement that surrounds embryonic stem cells, it is surprising that we know relatively little about the mechanisms that regulate their earliest fate choices. Although there has been some success at generating differentiated cells from ES cells, the intermediate steps along the way are, as pointed out by **Gordon Keller**, simply a "black box". Both Keller and **Shinichi Nishikawa** are finally opening up this black box by developing reporter ES cell lines in which either fluorescent markers or cell surface tags are expressed under the control of the regulatory sequences of genes that mark early mesendoderm or endoderm populations.

Nishikawa is exploiting these tools to search the genes that regulate lineage choice. After isolating the early specified subpopulations, he subjects them to microarray analysis and then uses bespoke bioinformatic tools to spot candidate regulators according to their characteristic expression profiles. These candidates are then tested using retrovirally-delivered shRNA. Both Keller and Nishikawa's groups have identified activin as a key inducer of endoderm differentiation, Keller further showed that activin acts in a dose-dependent manner together with Wnt to induce different mesendoderm and endoderm populations.

ES cells are often though of as a source of cells for drug screening or cell replacement therapies, but Keller and Nishikawa emphasized that these cells also give an insight into how early fate decisions are regulated *in vivo*. Work from **Liz Robertson** confirmed this assertion when she told us how nodal, (a molecule closely related to activin, and with similar activity) acts in a dose dependent manner as a pivotal regulator of germ layer specification in mouse embryos.

Janet Rossant is interested even earlier fate decisions: the choice of whether to contribute to the embryo itself or to one to one of the two extraembryonic lineages, trophectoderm or extraembryonic endoderm. Representative cell lines for both trophectoderm (TS cells) and extraembryonic endoderm (Xen cells) have been generated in her lab, whilst ES cells represent stem cells of the embryonic lineage. Remarkably, it seems that by manipulating a few key intrinsic determinants, Cdx2, GATA6, Oct4 or Nanog, it is possible to switch between the three lineages both in the cell lines and in the embryo.

Rossant used these key genes as markers to ask how lineages become segregated in vivo. GATA6+ cells, assumed to generate primitive endoderm, are initially intermingled amongst the cells of the inner cell mass, suggesting that they are pre-specified independently of their position and later segregate out to form a coherent tissue. In contrast, a different type of mechanism governs the even earlier decision to become trophectoderm, which is marked by Cdx2. The Cdx2+ cells appear to become segregated to the outermost cells of the embryo by polarised cell division, which suggests that this very first fate decision depends on simply being in the right place at the right time.

Sally Lowell, *Institute for Stem Cell Research, University of Edinburgh,*

Developmental Biology solving human disorders

This session was chaired by **Didier Stainier** (UCSF), who also made the first presentation. He addressed the developmental mechanisms of hepatopancreatic system. Didier suggested that foregut endodermal cells received the signal from adjacent cardiac mesoderm for the patterning of hepatopancreatic ducts and organs. *Fgf10* mutants showed mis-differentiation of the proximal pancreas into hepatic cells and liver to pancreatic cells, indicating the multi-potency of foregut cells, which highlights the novel role of Fgf10 in the development of hepatopancreatic system.

It is always encouraging to see fresh talent amongst the more "experienced" scientists within such venues. In this session, the next two presentations were from postgraduate students. **Rees** (University of Bristol) presented work on colorectal cancer. He showed the synergic interaction of Wnt and Shh signalling based on the fact that cyclopamine (Shh inhibitor) decreased the transcription activity of □eta-catenin/TCF while increasing E- cadherin expression, which may contribute to tumour invasion. **Clement** (University of Sheffield), addressed the questions underlining the role of the proteoglycans in skeletal development using zebrafish as model organism. She proposed the *dackel, boxer* and *pinscher* as candidate genes for the exostoses since they affect the stacking of chondrocytes in cartilage and their subsequent ossification of cartilage. Future work will help to elucidate the possible mechanisms of hereditary multiple exostoses – the most common musculoskeletal disorder.

Continuing the theme of using zebrafish as an animal model for the solving human disorders, **Tanya Whitfield** (University of Sheffield) presented interesting work relating to the causes of human deafness. She was able to demonstrate how deafness is linked to physiological irregularity, using homozygous vgo/tbx1 mutant embryos. Transcription factors eya, tbx, otx, and Shh signalling were shown to be responsible for morphological defects contributing to human deafness.

Following a brief, and well-deserved break for refreshments, **David Tosh** (University of Bath) presented work concerning endoderm development. He proposed the use of the transdifferentation pathway as a suitable approach to elucidate the mechanism via which developmental genes are identified and their role investigated. His group has developed powerful model for the transformation the pancreas to liver and *vice versa*, which will help in the understanding of the inter-changeability between these phenotypes.

The concluding presentation was made by **Ethan Bier** (University of California). He addressed the use of *Drosophila* as a powerful tool for prediction of the evolutionary conserved genes responsible for various human diseases, as well as the integration of different disciplines such as genetics, bacterial toxicology and developmental biology, in targeting these genes.

Romana Kucerova, University of Aberdeen

Heparan sulphate proteoglycans and development

In this session, the chair **Charles Emerson** gave a thorough and clear introduction to the topic. He introduced us to the different classes of HSPGs, and to the enzymes involved in their synthesis and modification. He then went on to describe the work of his lab on the *sulf* genes and the 6-O-endosulphatases they encode. The wide-ranging defects found in the *sulf1/2* double knockout mice, together with experiments using mouse embryonic fibroblast and satellite cell cultures, allowed him to present models of how the levels of HSPG sulphation (decreased by the sulphatases) are important for regulating FGF signalling (increased sulphation = increased FGF signalling).

This was followed by two short talks chosen from the abstract submission. First, **Steve Freeman** from Betsy Pownall's lab discussed the role of *Xenopus tropicalis* Sulf1 in inhibition of FGF and BMP signalling. Second, **Sally Stringer** showed us how the sulphation levels of HSPGs are important for regulating binding to VEGF. She has been looking in zebrafish at 6-O-sulphotransferases as well as sulphatases (i.e. the effects of adding as well as removing 6-O-sulphate groups), specifically focussing on the process of angiogenesis, which requires VEGF signalling.

After a quick tea break we heard from **Scott Selleck**, who gave an excellent talk on his work using the neuromuscular junction in *Drosophila* as a model for the cellular function of HSPGs. He showed how mutants in HSPG synthesis and sulphation have defective membrane dynamics and how by electrophysiological recording he could pin these defects onto problems with the reserve pool of neurotransmitter vesicles. He bravely showed us his newest data suggesting that HSPGs are important for mitochondrial distribution on the muscle side of the synapse.

Isabel Guerrero showed beautiful pictures of her *Drosophila* wing disc clonal analysis. She is investigating the roles of lipid modification of Hh, and of the HSPG synthesis and sulphation genes, in the movement of Hh and activation of subsets of target genes with different thresholds. She introduced the new player *shifted*, which encodes an orthologue of human Wnt inhibitory factor and in flies seems to be involved in restricting movement of Hh.

Finally, we had a double-act from **Jerry Turnbull** and **Tarja Kinnunen**. Turnbull described the changing structures of heparan sulphate during mouse neural development and showed the complexity of sulfotransferase interdependency. Kinnunen uses *C. elegans* to investigate the roles of HSPGs in neuron migration.

Catherine Moore, Centre for Developmental and Biomedical Genetics, University of Sheffield

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Imaging and temporal understanding of development

The ability to analyse cell movements *in vivo* is fundamental to our understanding of embryonic development, and this session contained talks from four laboratories making use of advanced imaging techniques to address developmental questions. The session was chaired by **Richard Adams** (University of Cambridge, U.K.), whose is studying the development of the zebrafish forebrain. Extensive cell rearrangements occur during neurulation, with the neural tube forming from a flat sheet of cells and two eyes arising from a single cyclopic eye field. Richard described the use of 3D confocal imaging and computational analysis to track the movements of hundreds of cells simultaneously and develop a model of forebrain folding during neurulation.

Dan Kiehart (Duke University, U.S.A.) is using *Drosophila* dorsal closure as a model for epithelial sheet morphogenesis. The balance of forces from the actin-rich leading edge and the tension in the lateral epidermis leads to a gradual closure of the epidermis; surgical ablations reveal that each of these forces is orders of magnitude greater than the net force required for closure. The regulation of this balance of opposing forces seems to be a key part of closure, and the embryo is able to adjust these to compensate for a variety of surgical and genetic manipulations.

Kat Hadjantonakis (Sloan-Kettering Institute, U.S.A.) described the use of multiple spectrally-distinct fluorescent proteins to simultaneously image multiple cell types – and cellular compartments – within the living embryo. In addition to the mouse, Kat is making use of *Ciona*, at the other end of the chordate clade, to investigate the morphogenesis of the paraxial mesoderm.

The session concluded with a talk from **Scott Fraser** (California Institute of Technology, U.S.A.), who has been making use of confocal imaging to rapidly image fluorescently labelled cells in the zebrafish heart. Computational analysis is able to compensate for movements during the scanning process, building up 4D renderings of the beating heart and providing new insights into the process of heart development.

Paul Overton, MRC Developmental Neurobiology, London

Evolution and Development

Peter Holland – as both chairman and speaker – opened on a philosophical stance with the notion that the session was an opportunity to take stock of the field. He then went on to discuss his work on gene (cluster) evolution for Hox and ParaHox genes, arguing that the selective pressures maintaining clusters or permitting their break-up differ for different gene families. **Harv Isaacs** continued these lines of enquiry, focusing on the ParaHox genes in the frog *Xenopus tropicalis*. Through a combination of genomic organization and morpholino knockdown data, he concluded that what had been intra-cluster regulatory interactions in a Proto-Hox cluster have been retained, but are now manifest as inter-cluster interactions following cluster duplication and fragmentation.

Changing emphasis to cell lineages, **Andrea Pasini** described the development of the peripheral nervous system in the invertebrate chordate *Ciona intestinalis*. Fate mapping in a system with low cell number is combined with functional tests of whether inductive signaling pathways elucidated in vertebrates are conserved in this outgroup. **Nipam Patel** also presented early lineage and fate map work in a marine animal – the crustacean *Parhyale hawaiensis* – this time where the established point of comparison is segmentation in the fruit fly. One intriguing point is which germ layer(s) are involved in the segmentation process, and how these layers interact.

Comparison over a finer time-scale was explored in **Pat Simpson**'s discussion of proneural gene regulation in different *Drosophila* species. Her group's empirical work delves into nuances of enhancer function and evolution in the context of the *achaete-scute* genes and thoracic bristle patterning. Concluding the session, **Enrico Coen**'s exploration of flowering architecture and flower color was another instance of microevolutionary comparisons. However, empirical data were not the emphasis, but rather the starting point for modeling of adaptive landscapes. In graphically depicting three-dimensional phenotypic spaces, he was able to convey strikingly why some spaces, which in two-dimensional representations seem very different or even contradictory, are easily occupied. Here science met science fiction, as the audience was exhorted to think in higher dimensions, where there are connections via "evolutionary wormholes."

That is a fair consideration in taking stock of Evo-Devo research. Comparisons reveal both similarities and differences. The early work uncovered the similarities – surprising levels of conservation over vast evolutionary distances. Once conservation was established, descriptive work on differences afforded scope for speculation in this historically minded discipline. As Evo-Devo matures into adolescence, the tool kit for comparative work has been expanded and honed, and the biological scope is broad. As researchers take diverging paths of investigation, meeting sessions such as this one provide a forum for insightful discourse that makes higher-level connections. This will maintain Evo-Devo as a field of research with a common thread, rather than merely a catchy umbrella term for a medley of interesting studies.

Kristen Panfilio, University Museum of Zoology, Cambridge

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Reviewing a book for the BSDB

Unfortunately, some late 'no-shows' mean that there are no book reviews in this issue. Hopefully this will be rectified for the next edition.

Suggestions for future book reviews are always welcome. If you know a book you think should be reviewed, please contact the Editor. Reviewers receive a free copy of the book for their trouble.

From CUP

Principles and Techniques of Biochemistry and Molecular Biology, 6th edition (Hardback)
Edited by Keith Wilson, John Walker
New, fully updated edition of bestselling textbook, expanded to include techniques from across the biosciences.
http://www.cambridge.org/0521828899

Key Experiments in Practical Developmental Biology (Hardback)
Edited by Manuel Marì-Beffa, Jennifer Knight
This manual presents 27 laboratory exercises for student practical classes in developmental biology.
http://www.cambridge.org/0521833159

RNA Interference Technology: From Basic Science to Drug Development (Hardback)
Edited by Krishnarao Appasani
Cutting-edge overview of RNA interference (RNAi) technology, covering both fundamental science and applications.
http://www.cambridge.org/0521836778

From Humana Press

MicroRNA Protocols
Ying
1-588-29-581-8

Epidermal Growth Factor
Patel & Bertics,
1-588-29421-8

DNA Repair Protocols. Mammalian Systems. 2nd ed.
Daryl S. Henderson (ed)
1-58829-513-3/973-7

Differential Display Methods and Protocols 2nd ed.
Peng Liang, Jonathan Meade and Arthur Pardee (eds)
1-58829-338-6

BSDB Discount from CSHL Press

Cold Spring Harbor Laboratory Press is offering a 15% discount on titles for BSDB members. In order to take advantage of this, visit their special offers page (http://www.scionpublishing.com/special/index.php).

Recent titles from CSHL Press:

The Writing Life of James D. Watson.
Professor, Promotor, Provocateur
Errol Friedberg
087969 7008

Gastrulation. From Cells to Embryos
Claudio Stern
087969 7075

Fly Pushing. The Theory and Practice of Drosophila Genetics, Second Edition
Ralph Greenspan
087969 7113

The Condensed Protocols *From Molecular Cloning: A Laboratory Manual*
This manual is a single-volume adaptation of the three-volume third edition of *Molecular Cloning: A Laboratory Manual.*

Won for All: How the *Drosophila* Genome Was Sequenced
Michael Ashburner

The Strongest Boy in the World: How Genetic Information is Reshaping Our Lives
Philip R. Reilly

24 BSDB Committee

The main function of the BSDB Committee is to organise our meetings, from deciding on appropriate topics to arranging organisers and venues. If you have any ideas on topics for a good meeting, or on a good venue, don't hesitate to convey them to Nancy Papalopulu (or another committee member). The officers of the Society will be happy to answer any questions relating to their specific subjects.

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The Back Page

OK, so no feedback (positive or negative) was forthcoming concerning the 'riddles' in the last issue. Hypogaeus is undaunted, seeing the absence of inhibition as a permissive signal to continue. Please feel free to send a contribution of your own!

Don't forget to visit the website for latest news:

www.bsdb.org

Added recently: link to the animal research petition

From Hypogaeus

1. Electorate split along party lines (4-5,9)

2. Inveterate animal has R & B but is spineless (12)

3. Garment consumed a model organism (8)

4. Do I hear a foreign (Greek) cat? No, wrong class (7)

5. Dicer makes short work of muddy rains (5)

6. Diminutive alignment program has been staged? (8)

7. This mutant has marvel-lous powers of tissue repair (9)

8. Boy scout made an amaizing mutation (7)

9. Cell is made if Rob dispersed by explosion (10)

10 Time changes everything at two levels; inside it's shoved over backwards (3-4)

Answers to previous riddles:

Gradient, von Baer, cerberus, asymmetric cell division, Pax6, Chip-chip, out on a limb, genomics, paracrine signal, migratory cell, meristem.

The BSDB gratefully acknowledges the continuing financial support of the Company of Biologists Ltd (CoB).

http://www.biologists.com/web/index.html