BSDB Newsletter

Winter 2014
Vol.35 No.1+2

British Society for Developmental Biology

www.bsdb.org

joint

BSDB-BSCB Spring Meeting
12–15 April 2015

celebrating 50 years of the BSCB

joint

BSDB Autumn Meeting with Portugese & Spanish Soc. of Dev. Biol.

Algarve
7-10 Oct 2015

The Company of Biologists

the NODE

BSDB Newsletter. Vol. 30, No. 2. Winter 2009

Editorial

This is my first Newsletter as the new BSDB Communications Officer, and I would like to take this opportunity to thank my predecessor Malcolm Logan for his hard work and excellent contributions.

Unfortunately, there has been an unusually long delay, but be assured that future editions of the Newsletter will arrive in their usual rhythm of twice a year. As will become clear from the various contributions in this issue, a number of changes have taken place during the past year. Most importantly, the **chair** was handed over from Liz Roberts to Ottoline Leyser who opens this Newsletter with her first welcome note. Furthermore, there are short introductions of our **new committee members**, Megan Davey, Andrew Oates and Michelle Ware. Of these, Michelle's position is a novelty as she is the first postdoc representative reflecting the Society's intention to give postdoctoral researchers a stronger presence and say. Furthermore, the first round of **Gurdon Summer Studentships** has been completed successfully and you can read an article by Sally Lowell about the scheme, as well as two project reports by Benedetta Carbone and George Choa. Finally, we provide the usual **Officers' reports**, an article about the joint BSDB-BSMB meeting by Danielle Blackwell and Gi Fay Mok, as well as a contribution from Stephen Freeman about his stay at the **RIKEN institute** in Japan.

I would like to take this chance to encourage all our members to distribute relevant information through the BSDB's communication routes, including our Newsletter, web site and The Node. Feel free to send in news articles and meeting reports (our own and other developmental meetings), comments (good and bad) and even a little "gossip". Even if you post things on your own blogs or as personal contributions on "The Node", we can help to further raise awareness of your pieces by linking out to them from the BSDB webpage or reprint them as contributions in the Newsletter, thus making sure our members are aware. Please send any contributions or links directly to me:

Andreas.Prokop@manchester.ac.uk

Cover images: *Axillary bud of Arabidopsis thaliana by Tanya Waldie (Sainsbury Laboratory, Cambridge)*

Contents

Chair's welcome note by Ottoline Leyser

"…the BSDB has always and must continue to embody the UK developmental biology community. That means you. So please let the BSDB Committee know what the Society can do for you, and ask yourself what you can do for the Society."

"…I would also like to thank Liz Robertson for her wonderful Chairmanship over the past 5 years, navigating brilliantly through difficult issues such as the proposed name change."

This is my first contribution to the BSDB Newsletter as Chair, so it seems appropriate to start by **introducing myself**. I have noticed that developmental biologists like to define themselves by their organism of study. I am a plant person. There are relatively few of us, so we get to define ourselves by an entire kingdom. Mostly I work on **Arabidopsis** and I am interested in developmental plasticity, using **shoot branching** as a model system. The central question of my research is how and why does a single genotype give rise to plant forms ranging from a solitary unbranched shoot to a massively ramified bush?

I work in a new plant developmental biology research institute, the **Sainsbury Laboratory**, at the University of **Cambridge**, which is funded by the Gatsby Foundation. The ethos of the institute is to promote **interdisciplinary collaboration** to address major questions in plant development. The inspiration for the Laboratory is the extremely exciting position in which developmental biology currently sits. After many years of painstakingly identifying the important regulatory components of developmental systems, it is now possible to focus on how they work dynamically in space and time to drive the extraordinary self-assembly process of development. At the same time, new tools have come on stream to fuel this integrative analysis, such as amazing advances in live imaging, diverse omic technologies, and a resurgence in computational modeling of developmental systems. This is really a great time to be a developmental biologist, and I think the BSDB has an important role to play in seizing the day.

Successfully exploiting these new approaches is necessarily a collaborative and community wide endeavour, and the **BSDB** has always and must continue to embody the UK developmental biology community. That means you. So please let the BSDB Committee know **what the Society can do for you**, and ask yourself **what you can do for the Society**. Should the autumn meeting be run by and for PhD students and post docs every other year? Would you like to organise it? Should we spend money developing some professional quality developmental biology outreach resources? Do you have any ideas about what would work with different audiences? The Committee is always happy to hear from you and the Society is entirely dependent on people's willingness to work on its behalf.

Speaking of which, I would like to take this opportunity to thank the **retiring members** of the Committee very much for their excellent service, and the **new members** of the Committee for volunteering their time. Keith Brennan and Fiona Wardle have stepped down, and Andy Oates and Megan Davey have stepped up. We have also added a post-doc rep, Michelle Ware. Many thanks to all of them. And of course I would also like to **thank Liz Robertson** for her wonderful Chairmanship over the past 5 years, navigating brilliantly through difficult issues such as the proposed name change. The Society is clearly thriving and I hope her modesty will allow her to accept some of the credit and our warm thanks.

Ottoline Leyser

Secretary's report by Kim Dale

"There will be 4 vacant positions on the committee to be filled at the next Spring meeting. So please ... send in your nomination to me at any time."

"In a few days (15 January) is the application deadline for the 2015 Beddington award .. send in your nomination to me at any time."

I am pleased to say the Society has had a great year! Lots of new members joining the Society as well as two **new committee members** voted in during the Spring meeting; welcome aboard to Megan Davey (page 12) from the Roslin Institute in Edinburgh and Andy Oates (page 12) from NIMR in London. We have also very recently appointed a new position on the committee, namely a **postdoctoral rep**. We had a good response to the advertised post and after a tough decision by the voting panel, the coveted position has been given to Michelle Ware (page 13) now in her second postdoctoral fellowship at the Institute of Genetics and Development in Rennes, France. This is a two year post and the role is to serve as a voice for the BSDB postdoc community at BSDB committee meetings and as an ambassador for the Society among the post doc community. So please do contact Michelle if there are things you would like to share, suggest, discuss etc. Contacts of all committee members can be found on our website (bsdb.org/about-us).

For the first time at the Spring 2015 meeting in Warwick we will be offering both a **student and a post doc poster prize** and so one of Michelle's first exciting tasks will be to organise this event together with the BSCB postdoc rep and select judges etc. So please think ahead and make your poster count!

In a few days (15 January) is the application deadline for the **2015 Beddington award**, so please do think about potential candidates for this very prestigious prize or perhaps even think about whether you might want to be put forward!

There will be **4 vacant positions on the committee** to be filled at the next Spring meeting. So please do put your thinking hats on as to whom you might wish to nominate and send in your nomination to me at any time. Please do come along to the AGM to vote on these new members and to voice your opinions on any matter that you would like to see raised for your Society to discuss

This **Spring meeting** has a fantastic line up and so do make sure you apply in plenty of time to benefit from the travel grant deadline – this year's **deadline** is 2 February and the abstract submission deadline is on 12th February.

Kim Dale

Travel grants

Travel Grant deadline for the joint Spring Meeting: 02 January 2015

Note, that only BSDB members paying the correct subscription to the Society will be eligible for a Travel Grant.

Members can apply for BSDB Conference Grants to attend BSDB-sponsored meetings, for CoB Travel Grants to attend meetings and courses outside the UK, and the Louie Hamilton Fund provides travel support for handicapped members. For more information visit: bsdb.org/membership/meeting-grants

Subscription information

Full members: **£35** per annum

Students: **£15** per annum (as long as you have student status, max. for 4 years)

Student members that joined the Society in 2011 are reminded to upgrade their subscription to the full member rate of £35.

Meeting Officer's report by Joshua Brickman

"12-15 April 2015 in Warwick: our Spring Meeting held jointly with the BSCB. This year is a special one, as it is the BSCB's 50th anniversary, so don't miss it!"

"7-10 October 2015 in the Algarve (Portugal): the first ever joint Autumn Meeting of the BSDB with the Portuguese and Spanish Societies for Developmental Biology. ...there are many low budget airlines that fly directly there!"

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 meetings@bsdb.org

This year we had **two fall meetings**. Both were scientifically a success and we have actually spent less on meetings this year than projected in our current financial plan.

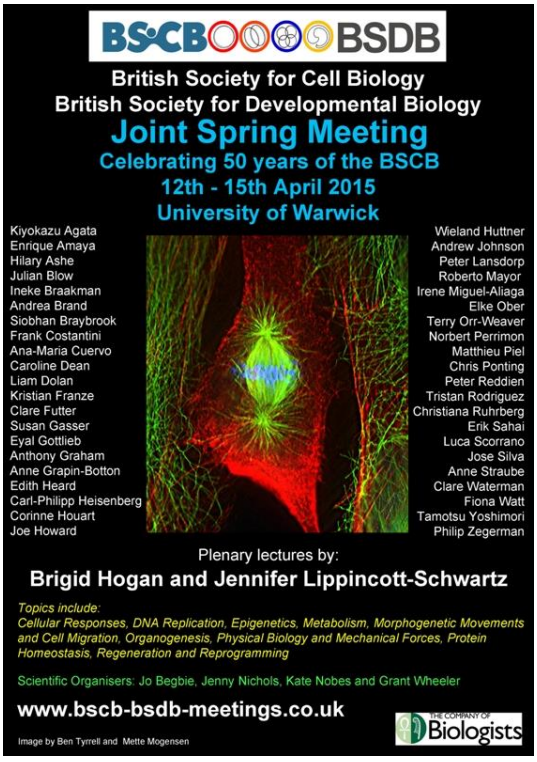
Our traditional fall meeting was held jointly with the British Societies for Matrix Biology (BSMB), "**The Musculoskeletal System: from development to disease."** The conference was attended by 116 delegates and held at the beginning of September in the Julian Study Centre at the University of East Anglia. It featured an opening Keynote from Tom Rando (Stanford) and featured topics from Mechanobiology through to Epigenetic Regulation. The BSDB organizer for this meeting was Andrea Münsterberg, who did a fantastic job.

Our second fall meeting this year was a special **joint event with the International Society for Differentiation.** This meeting featured a stellar line up of world leaders in both development and differentiation and was co-organized by the BSDB with Marianne Bonner (president of the International Society for Differentiation). Keynote talks showcased the UK with John Gurdon, Fiona Watt and Liz Robertson. David Kingsley was the token American keynote, although the rest of the line-up was spread evenly across the world. The meeting was held in a spectacular venue by Tower Bridge in London and had 211 delegates. With additional support from the Wellcome Trust, we were able to offer an unprecedented number of travel awards.

Upcoming meetings for 2015 include our **Spring Meeting** held jointly with the BSCB. This year is a special one, as it is the **BSCB's 50th anniversary**, so don't miss it! Over the last three years we have started a new format jointly with the BSCB of completely integrated meetings (no more BSDB, BSCB sessions) and from all the feedback we have had, they have been a spectacular success. If you have not attended one recently you really should check it out. It will occur on 12th – 15th April 2015 in Warwick.

We also have a special **meeting for this fall**. This fall we will hold the first ever joint **Autumn Meeting** of the BSDB with the Portuguese and Spanish Societies for Developmental Biology. Our organizer is Kate Storey and it promises to be both a great meeting. It will be held **October 7-10, in the Algarve, Portugal**. As Algarve is a holiday destination from the UK there are many low budget airlines that fly directly there, so we anticipate a large BSDB contingent. There will, of course, be travel awards available.

Joshua Brickman



BBSMB/BSDB joint meeting report

by Danielle Blackwell and Gi Fay Mok

The Musculoskeletal System: from development to disease

(1-3 September 2014, University of East Anglia, Norwich)

The first joint meeting of the British Societies for Matrix Biology (BSMB) and Developmental Biology (BSDB) was, in our opinion, a great success. The meeting was held over three days, which were packed with brilliant science from different areas of musculoskeletal research, presented in talks, posters and general discussions. The conference, attended by around 120 delegates, was held in the brand new Julian Study Centre at the University of East Anglia, in a comfortable and well-equipped lecture theatre, with separate rooms for posters and exhibitors and break out spaces for coffee, snacks and mingling.

The **opening Keynote** speaker was Tom Rando (Stanford) whose lecture was sponsored by the International Society for Developmental Biology and Mechanisms of Development. His presentation provided an awesome start to the conference with a fascinating account of his group's work into a primed state of quiescent stem cells in muscle (Satellite cells). This turned out to be one of the highlights of the conference for me (DB), as it is closely related to my own research.

The Keynote was followed by an exciting afternoon of presentations within the area of **'Signalling and Development'**. Standout talks from this session included Gabrielle Kardon (Utah) on the development of the diaphragm, which is impaired in congenital diaphragmatic hernias, a condition with high mortality rates where holes develop in the diaphragm. Her lab uses elegant mouse genetics approaches to dissect the contributions of connective tissues and muscle to this severe phenotype. Malcolm Logan (London) talked on the advanced imaging and mouse genetics approaches they use to examine the cellular events regulating muscle and tendon formation in the limb, and Christine Hartmann (Münster) presented a detailed analysis of the role of Wnt signalling during trabecular bone formation.

One great feature of the conference was the opportunity offered to attendees, including PhD students and post-docs, to present their work in **short talks** after selection from submitted abstracts. Therefore, I (GFM) was able to present my work on microRNA mediated regulation of chromatin regulators during muscle development. I was also awarded one of three poster prizes, sponsored by the International Journal of Experimental Pathology (IJEP), on this topic. Other speakers in this session were Anne-Gaelle Borycki (Sheffield), who spoke about the composition of the muscle stem cell niche. Her student, Daniel Ranaldi, also won a prize for his excellent poster on this work. Dylan Sweetman (Nottingham) presented on the signals that activate the skeletal muscle programme in limb muscles, Susanne Dietrich (Portsmouth) discussed the role of innervation of hypaxial and epaxial muscles for the evolution of 3D mobility, and Clare Thompson (London) and Sue Kimber (Manchester) presented on signals in chondrocytes and their differentiation from pluripotent stem cell for the purpose of cartilage repair.

The first day ended with a lively **evening poster session and reception**, where the atmosphere, fuelled by a couple of glasses of free wine and nibbles, was bustling with stimulating conversations. This was my (DB) first opportunity to present some of my PhD work in the form of a poster and the sessions allowed for brilliant discussions with other students working in the field, but also with experienced researchers. It felt great to be able to discuss and get feedback on my work from my peers.

The second day consisted of two sessions. The first focussed on **'Mechanobiology and Anatomy'** and started with a fascinating talk from Eli Zelzer (Israel), with his group's novel take on the mechanics of fracture repair. Other great talks included Paul O'Higgins (York), who presented approaches to use finite element analysis to simulate bone deformations under loading conditions, leading to the variation of form during evolution. Chrissy Hammond (Bristol) gave a really interesting talk on the importance of mechanical loading for jaw development in

zebrafish and her student, Lucy Brunt, won the third poster prize for her presentation of this work. Mario Giorgi (London) presented on the role of fetal movement in hip joint morphogenesis and his selected talk was awarded a prize for best oral presentation by a young scientist, which was sponsored by Orthopaedic Research UK. After a quick coffee break, we heard impressive talks by Ronen Schweitzer (Portland) on tendon growth in the mouse limb and Andy Pitsillides (London) on his group's work on mechanical stimuli that are important for limb growth and joint formation. Additional short talks in this session were presented by Angela Yiu (London) on Fat-Hippo signalling in bone development, Cornelia Stein (Cologne) on hemicentin ECM proteins for the development and function of the myotendinous junction in mouse and zebrafish, Herbert Tempfer (Salzburg) on the origin of tendon cells, and Rebecca Rolfe (Dublin) on the impact of muscle contractions for ossification and joint formation.

The afternoon session was on **'Human Genetics and Pathology'** with talks by Mike Briggs (Newcastle), Madeleine Durbeej (Lund), Linda Troeberg (Oxford) and an IJEP-sponsored lecture by Veronique Lefebvre (Cleveland). The presentations offered great insights into the current research into the molecular and genetic bases for muscular dystrophies and joint pathologies, as well as the molecular regulation of normal cartilage and joint development. Short talks completed this session and were given by Qing-Jun Meng (Manchester), Pradeep Kumar Sacitharan (Oxford) and Carole Proctor (Newcastle) on tissue specific circadian clocks, and the molecular drivers of joint inflammation and ageing cartilage.

Another real 'plus point' for the meeting was that it enabled interactions of developmental biologists with matrix biologists and human geneticists to share ideas with each other, thus initiating stimulating discussions and possible collaborations. This was in part facilitated by the evening's **conference dinner**, which was held at St. Andrews Hall, a grade 1 listed building dating back to the 14th Century in the centre of Norwich. The Hall provided a great venue and atmosphere for more relaxed discussions of the days events.

The final day played host to the final session on **'Transcriptional and Epigenetic Regulation'** with great talks by Cay Kielty (Manchester) on genotypes of fibrillinopathies and Simon Tew (Liverpool) on the importance of RNA stability and turnover for chondrocyte biology. Short talks were given by Matt Barter (Newcastle) on the role of a novel long non-coding RNA in cartilage and Linh Le (Norwich) on the microRNA-29 family in osteoarthritis. The BSMB also awarded their Society's Young Investigator Award to Blandine Poulet (London) and she gave a lovely talk on her work on modelling osteoarthritis. The **final Keynote**, sponsored by Developmental Dynamics, was delivered by David Glass (Novartis, Boston), who gave the most fascinating and entertaining talk on his group's work in developing an antibody treatment for patients with muscular atrophies. This was another highlight to end a fantastic conference, which covered the full breadth from developmental biology to pathology and therapeutic approaches in the musculoskeletal system.

We would like to give our thanks and congratulations to the organizers of this first joint meeting of the BSMB and BSDB, which we thought was really **well balanced and of interest for members of both societies**. We are grateful to the panel composed of invited speakers judging eligible posters and short talks, and thank the many commercial sponsors who made this meeting possible with their support. We look forward to future opportunities for joint meetings.

Finally, we would like to thank the **BSDB/Company of Biologists** for providing travel awards for us to attend.

Danielle Blackwell and Gi Fay Mok - School of Biological Sciences, University of East Anglia, Norwich

Awards in 2014

The BSDB would like to congratulate all awardees of 2014 including the Waddington Medal winner Phil Ingham (*see: bsdb.org/awards/the-waddington-medal*), the Beddington Medal winner William Razzell (*see: bsdb.org/awards/the-beddington-medal*), the 10 Gurdon Summer Studentship winners Ashley Bae (*host: Ildiko Somorjai, St Andrews*), George Hunt (*Ian Hope, Leeds*), Ariana Mihai (*Val Wilson, Edinburgh*), Benedetta Carbone (*Keisuke Kaji, Edinburgh*), Lydia Dugmore (*Iwan Evans, Sheffield*), Sian Martin (*Susanne Dietrich, Portsmouth*), Rachel Turner (*Alistair McGregor, Oxford*), Kadri Oras (*Martin Collinson, Aberdeen*), George Choa (*Claudio Stern, UCL*), Kwok Lun Man (*Arantza Barrios, UCL*), and the BSDB poster prize winners at the last joint Spring meeting: Ms. Z.M. Löf-Öhlin, Mr. J.M. Grice and Mr. M. Figueiredo-Larsen.

Julian Hart Lewis (1946-2014)

On April 30th 2014, Julian Hart Lewis, developmental biologist and longstanding BSDB member, passed away aged 67. Obituaries were published by Paul Martin and David Ish-Horowicz in **Development** (141, pp. 2919 f.; LINK) and by Tanya T. Whitfield and Nick Monk in **Developmental Cell** (29, pp. 507 ff., LINK).

"He combined a formidable intellect and mathematical training with experimental dexterity and deep biological insight, and used these to great effect to study key questions in early embryonic patterning, neurogenesis and, most recently, Notch signalling and somitogenesis."

Treasurer's report by Christopher Thompson

"The Society awarded a total of 98 grants to allow members to attend BSDB meetings"

"Membership currently stands at around 1200 members, with around 750 full and 450 student members"

"..the Society continues to have a very healthy reserve to cope with unforeseen events .. and .. to invest in new activities to promote developmental biology."

The last year has again been a successful one. The Society awarded a total of **98 grants** to allow members to attend BSDB meetings (89 to the Spring meeting 2014 in Warwick, 9 to the Autumn Meeting 2014 in Norwich) at a total cost of £38,320. This expenditure was slightly higher than the income the Society received from its membership (£36,545), which is itself at a record high. **Membership** currently stands at around 1200 members, with around 750 full and 450 student members. The Society receives a sum from the **Company of Biologists (CoB)**, which provides for the running of the Society (£35,000) and an amount (£35,000) to spend on CoB/BSDB travel awards to enable our members to attend overseas meetings. Over the last year we gave out slightly more in CoB/BSDB awards than budgeted (£35,500), reflecting both the high demand for the awards and our relatively good financial position, with awards being made to all eligible applicants. In total **88 CoB/BSDB travel awards** were made 2013-14.

Although from the accounts it appears that we made an overall loss of £21K on the year, £20K of this apparent loss is due to the purchase of a new investment in the **Baillie Gifford Fund**, the main vehicle for the Society's reserves (i.e., we have used some of the Society's high bank balance to increase our reserves). This reserve will normally easily outperform the interest rate provide by our "High Interest" bank account (e.g., last year our reserves increased by over 4% whereas our current account earned less than 0.5%). Thus, overall our **actual loss** on the year was £1,582. Bearing in mind that for the first time we funded **10 Gurdon Summer Studentships** (at a cost of £14,400), the almost balanced budget suggests that we can continue to support this new expenditure in a sustainable fashion.

Our ability to maintain such a **healthy balance** on current expenditure is largely due to the great efforts of our conference organisers, both to raise income via sponsorship and by keeping costs under control. Both the **Autumn Meeting** 2013 (Aberdeen) and the **Spring Meeting** 2014 (Warwick) returned income to the Society, with the total (£10,468) not being too far short of our commitment to the Gurdon Studentships.

The financial reserves of the Society are invested in Baillie Gifford and L&G funds and, overall, these did well over the last 12 months. As a result of this, and the balanced budget, the Society continues to have a **very healthy reserve** to cope with unforeseen events (e.g., cancellation of a meeting) and, indeed, to invest in new activities to promote developmental biology. Our overall solid financial health means that we can do this without any significant threat to the core business of the Society.

Christopher Thompson

BRITISH SOCIETY FOR DEVELOPMENTAL BIOLOGY

FINANCIAL STATEMENT YEAR ENDING JULY 31st 2014

Accurals Basis

Balance Sheet

2012/2013 £		2013/2014 £
	Investments	
57,679	L&G Global 100 Index Trust ®	61,237
224,774	Baillie Gifford Managed Fund	252,923
	Current Assets	
102,488	Barclays Bank High Interest Account	82,969
12,091	Barclays Bank Current Account	10,029
3,056	Barclays Bank: Louie Hamilton Account (1,2)	3,056
117,635	**Total Current Assets**	96,053
	Less: Unpresented cheques	0
	Debtors – Creditors	0
117,635	Net Current Assets	96,053
400,087	**Total Funds**	**410,213**

Income & Expenditure Account

Income	£	Expenditure	£
Membership (Standing Order & PayPal)	36,545	Grants (Overseas & Courses)	35,550
Block Grant (CoB)	35,000	Grants (BSBD Meetings)	38,320
Travel grant fund (CoB)	35,000	Gurdon Summer Studentships	14,400
Autumn Meeting 2013 (Aberdeen)	3,686	Autumn Meeting 2013 (Aberdeen)	6,000
Spring Meeting 2014 (Warwick)	6,782	Spring Meeting 2014 (Warwick)	12,310
Refunds in	2,100	Prizes	1,231
Unpresented cheques 13-14	0	Committee & administration	8,917
		ISDB membership	1,529
Interest and Investment Appreciation:		Bank Charges	39
Barclays High Interest a/c	44	Refunds out	2,443
Barclays Louie Hamilton a/c		New Investments	20,000
Total Income	**119,157**	Total Expenditure	**140,739**
		Net Surplus for the Year	**-21,582**
		Unrealised Gains on Baillie Gifford	28,149
		Unrealised Gains on L&G	3,558
		Fund balance at 31st July 2013	400,087
		Fund balance at 31st July 2014	**410,213**

Notes

These accounts were prepared under the accrual basis convention, in accordance with the applicable accounting standards and Recommended Practice of Accounting by Charities. There have been no major changes to our financial arrangements this year.

1. The Louie Hamilton account valuation is at 14.9.13

2. This is the only restricted account and no call was made on it in the financial year 2013/14

BSDB communication by Andreas Prokop

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

"..the committee has decided to become more proactive with respect to science communication promoting the wider recognition of the importance of Developmental Biology "

If you are interested in science communication and outreach, see our collection of helpful resources: bsdb.org/public-outreach

As you may have seen already, some changes have been introduced on our **bsdb.org website**. Its structure has been slightly reorganised and its readability was improved through the more prominent use of text boxes. More changes are expected when we move the site to a new host location in the near future which will involve choosing a new page design. We aim to keep most aspects of the site's current style but also to add new features, such as inserting our logo in the banner, and introducing a better interface with social media including the provision of sharing and alert options.

In order to enhance the Society's information strategy, we collaborate with Catarina Vicente at **The Node**, run by the Company of Biologists. The Node is far better suited for publishing longer articles, films or interviews than our site, and these posts can then be advertised through news items on the BSDB web site. You can also directly search them on The Node by simply typing "BSDB" into their search box. This way, we maximise the visibility of relevant news which is then further enhanced through tweets from @the_Node reaching a community of over 2500 followers. Therefore, please do not hesitate to send in any information or contributions you might find helpful for BSDB members. I will do my best to disseminate these through our various routes.

It has been decided in the last committee meeting that we will set up a **meeting calendar** on our web site, which will also provide an opportunity for members to spread the news about other meetings or workshops relevant to Developmental Biology. We also consider using this calendar to display the impressive meeting history of the BSDB, but this will depend on whether this information can be retrieved (and here you may be able to help!). As a further resource to display the Society's past, we made **old BSDB Newsletters** available through our website (bsdb.org/about-us/bsdb-newsletters). So far, I have been able to obtain all issues dating back to the year 1999. Please, do not hesitate to send me scans or original files of older issues you may have.

Finally, the committee has decided to become more proactive with respect to **science communication**, promoting the wider recognition of the importance of Developmental Biology. In particular, the debate about the BSDB's title change revealed a general concern about the wider appreciation of our discipline. As a simple strategy to improve on this, we aim to raise awareness about simple definitions and the most powerful arguments for Developmental Biology which can be used with different target audiences, such as colleagues of other disciplines, University students and the general public including schools. To start implementing this strategy, the current "Resources" and "Outreach" tabs on our web site will be reorganised, and "definitions" as well as "arguments for Developmental Biology" will be added. These will hopefully help to stir some debate within our community to refine, complement and improve them. Further steps will follow and will be announced in due course.

Andreas Prokop

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

www.biologists.com

BSDB Gurdon Summer Studentships
by Sally Lowell

" Our Gurdon Summer Studentships support a stipend of £180/week for 8 weeks lab work in the broad area of Developmental Biology, supervised by a BSDB member."

In his millennial article on the history of the BSDB [1], Jonathan Slack tells us "The inaugural scientific meeting of the Society for Developmental Biology was held in Oxford on June 20th 1964 hosted by Dr J.B. Gurdon (now Sir John Gurdon). At the previous committee meeting it was decided to provide coffee, biscuits and tea free of charge to the participants, signalling that the financial position of the Society was sound."

The society, now known as the BSDB, has gone on from strength to strength since those early days. We are glad to report that the financial position remains strong enough to support not only free biscuits at our meetings but also a number of important schemes to support our community. In 2014, we added a **new funding award** to support undergraduate vacation work in developmental biology labs.

The chance to spend a summer working in a 'real' research lab can make an enormous difference to undergraduate students. It can give them the confidence to pursue a PhD after their first degree, and help them to rise to the top of the pile of PhD applicants. We have named this scheme after **Sir John Gurdon** to commemorate his pioneering achievements, which include not only acting as the host of our inaugural scientific meeting in 1964, but also winning the Nobel Prize for Physiology and Medicine in 2013.

Our Gurdon Summer Studentships support a stipend of **£180/week for 8 weeks** lab work in the broad area of Developmental Biology, supervised by a BSDB member. After completing their summer work, we ask our awardees to write a brief article, and the best of these are published on The Node and in our Newletter (next two articles). Full details can be found on our website: bsdb.org/awards/gurdon-studentships-for-summer-vacation-work

[1] Slack (2000) Int.J.Dev.Biol.44, 79ff.

Sally Lowell

Gurdon Summer Studentship report by Benedetta Carbone

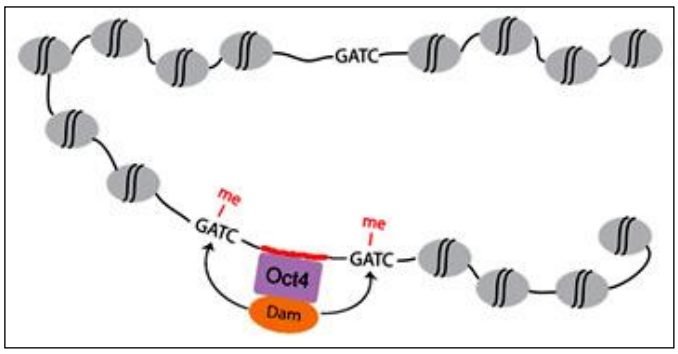
I'm Benedetta, an undergraduate student studying Molecular Genetics at the University of Edinburgh.

This summer I had the amazing opportunity to spend 8 weeks in a research lab working on stem cells.

It all started out because after 3 years of studying Biology and an interest in building a career in research, I didn't really know what the job of a full time researcher looked like. So, encouraged by University professors, I started investigating fields and topics that I had liked the most during my studies.

I was doing some research on induced pluripotent stem cells when I came across Dr. Kaji's lab at the Centre for Regenerative Medicine in Edinburgh. Their work focuses on the Biology of Reprogramming, the molecular changes that occur in reprogramming cells and how the process can be further understood and improved.

I contacted him to ask if I could join the lab for the summer. He offered me a place for an internship and designed a project focusing on DNA adenine methyltransferase identification (DamID). DamID is a technique based on the bacterial protein DNA adenine methyltransferase (Dam). This protein recognises GATC sequences and methylates position 6 of the adenine. DamID works by tethering Dam to a DNA-binding protein. The target protein binds to DNA localising Dam to the same sites within the genome. Thus, Dam has a higher chance of methylating GATC sequences around the binding site of the target protein. DamID is hence used to detect DNA-binding sites for target proteins, producing data similar to ChIP-seq. As a result, DamID does not require the use of any antibody, reducing the amount of time necessary to process DNA and the amount of cells required as starting material.



One of the PhD students in Dr. Kaji's Lab, Luca Tosti, has been working with DamID and the aim of my summer project was to test the DamID technology by generating my own Dam expressing cell line to investigate Oct4 binding sites in mouse Embryonic Stem Cells (mESCs).

And so my internship began. At first I was a bit overwhelmed and I found myself confused by very simple things. It quickly got a lot better, thanks to everyone in the lab (especially Luca!): they were all very friendly, helpful and patient!

I started by cloning the expression vectors and I gained experience in basic molecular biology techniques such as restriction enzyme digestions and ligations, bacterial transformations, extraction of plasmid DNA and gel electrophoresis. I also familiarised myself with the ApE software to design cloning strategies.

I generated several vectors to test different levels of Dam expression in order to get a good signal-to-noise ratio. Indeed, one of the main issues related to this technology is the high background signal arising from the intrinsic DNA-binding activity of the Dam protein.

Afterward, I was introduced to tissue culture where I worked with mouse ESCs (mESCs). I learned how to maintain mESCs in culture and how to passage them when confluent. I also gained experience on plasmid transfection, picking colonies, freezing and thawing cells. I transfected mESCs with the vectors I had previously generated and I used the antibiotic resistance cassette I had cloned into the constructs to select for cells expressing the transgene.

As a part of the project, I also wanted to check how the adenine methylation signal changes when mESCs differentiate, and for this purpose I performed retinoic acid (RA) differentiation of mESCs. After removing Leukaemia Inhibitory Factor (LIF, a signalling molecule important for maintaining the undifferentiated state of mESCs) and adding RA to the medium (for 9 days), I was able to observe significant morphological changes.

I then went back to the lab bench: I learned how to extract RNA and how to perform RT-qPCR to determine gene expression patterns. Using this approach I could confirm that differentiated cells had switched off pluripotency markers. I also learned how to extract genomic DNA and how to use enzymatic digestion coupled to qPCR to quantify the methylation levels of DNA around GATC sequences.

My results were very encouraging. I managed to get good expression of the Dam-Oct4 fusion protein and to observe good positive signal correlating well with published ChIP-seq datasets.

This internship has been an amazing experience for me. I found the work of a researcher both challenging and rewarding and it definitely encouraged me to pursue a career in science.

I would recommend this experience to any Biology student who wants to learn how real research is carried forward.

Benedetta Carbone

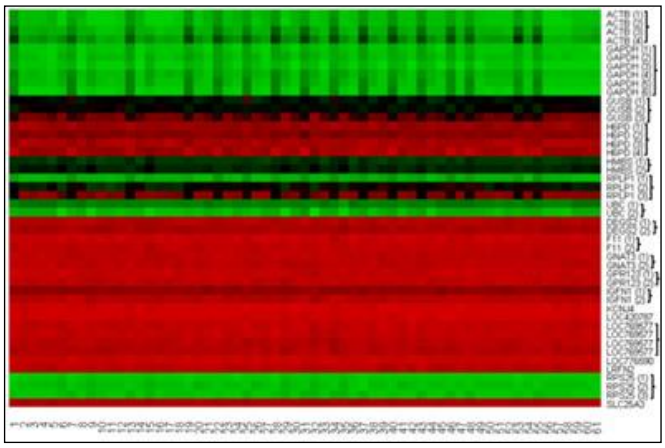
Reviewing a book for the BSDB

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

Gurdon Summer Studentship report by George Choa

Is there such thing as a housekeeping gene?

This summer I undertook an internship in the Research Department of Cell and Developmental Biology (CDB) at University College London (UCL). Joining the Organiser subgroup, my project involved determining the existence of a "housekeeping" gene (HKG), a gene that has both ubiquitous *and* uniform expression across different tissues types, no matter normal or diseased tissue, no matter the stage of embryo development, and no matter the model system used. HKGs act as reference genes in cases where magnitude of expression is required to be normalised, for example in RT-PCRs and northern blotting.

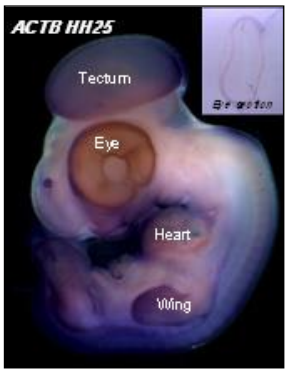


In order to confine the number of candidate genes for the project, specific criteria were applied to two sets of chick RNA data - quantitative expression values from microarray screens and RNASeq tissue assays, which were collected over time at both the Stern Lab at UCL and the Streit Lab at King's College London (KCL). Simply done on Microsoft Excel, variance for each mRNA was calculated across samples of a variety of chick tissue types and stages, to which they were ranked. The least variant 5% (P = 0.05) and 1% (P = 0.01) mRNAs from microarray and RNASeq data, respectively, were selected. As this still left us with a total of more than 1500 mRNA HKG candidates, further filtration was applied, for example comparing the candidates to existing results in expression databases such as ZFin. This criteria resulted in a selection of 14 candidate HKGs, including genes that encode ribosomal proteins (RPS25) and channel proteins (KCNJ4). On top of this, an additional 9 probes that are considered conventional HKGs were also tested to confirm their reliability as HKGs; these conventional genes are commonly used as a baseline for a multitude of developmental studies, for example GAPDH and ACTB. All these probes were presented by box plots and heat maps using *R*, composed by me, taught by the Stern lab bioinformatician at the time; these were used in my end-of-project presentation.

The more practical side of my project came next. My first week consisted of firstly learning to harvest chick embryos. This required a lot of patience and resolution, something I've come to appreciate to be two of the most important features of working as a researcher in science. One of the biggest challenges was the application of different techniques when harvesting embryos of different stages; some could be harvested quickly, most others took time and extreme delicacy. It was easy competing with myself from the previous day as each day I matured my technique, collecting dozens in one sitting, easily collecting over 150 different embryos of different Hamburger Hamilton (HH) stages over my first six weeks.

Following learning the tricks of the embryology trade, I dove into the more molecular side of my project - *in situ* hybridisation (ISH). Probes were synthesised and purified, and harvested chick embryos were processed, both by Stern lab protocols, ready to be stained. From this, the probes that appeared convincingly uniform in expression, as well as a variety of the conventionally used HKGs, were processed through wax sectioning to gain a better, more comprehensive look at the extent of the staining, before, and after, which they were documented.

A range of data (115 embryos) were collected by the end of my project, and with the several-odd wax section images, I found that none of the candidate genes matched the requirements of a HKG; even those that were sectioned due to convincing ubiquitous expression, which includes those conventional HKGs that hitherto are being used to



normalise expression data. Having collected all my data and completed my project to the best of my abilities, I presented my work in one of the many lab meetings I had the opportunity to attend. It was without doubt odd to sum my eight weeks spent researching into a 15 minute PowerPoint, but it was also wholly rewarding to see all I accomplished over my time at the Stern lab. Data collected from my project seem quite cogent in that there is probably no such thing as a HKG, which the lab hopes to publish in the near future.

Going into my final year of my Biomedical Sciences degree, I cannot thank everyone in the lab enough for the guidance, support and endless conversation that kept conducting my project so lively and enjoyable. I must however thank in particular my principal investigator Claire and Tutor Claudio for being so patient with me throughout the whole endeavour, and I hope one day I will return to the lab to take on my own PhD.

George Choa, BSc Biomed. Sci., UCL

The new BSDB committee members

Find a list of all committee members on our web site: bsdb.org/about-us

Megan Davey

Megan came to the UK to study Developmental Biology at UCL, where she worked on the mouse limb mutant *Hypodactyly*. She worked as a research assistant to Prof Jamie Davies at the University of Edinburgh, before beginning a PhD at the University of Dundee, supported by the British Heart Foundation and the British Council. In the lab of Professor Cheryll Tickle she analysed Hedgehog signalling in the chicken *talpid*^{3} mutant. Megan's work contributed to mapping the *talpid*^{3} mutation and she has subsequently continued to work on *talpid*^{3}, first as a post-doc with Prof Dave Burt at The Roslin Institute, uncovering Hedgehog dependent pathways during limb development and then as a Career Track Fellow at Roslin, supported by a BBSRC Institute Fellowship. Megan's work aims to understand the function of the TALPID3 protein, a novel centrosomal protein essential for ciliogenesis, as well as the role of the centrosome and cilia in development. She also maintains an interest in the control of *SHH* expression during limb development, the scaling of limb bud size and anatomy, radius specification and timing of limb pattern specification, using polydactylous chicken breeds, oligodactylous emus and comparative genomics within avian clades. Megan lives at Edinburgh's seaside with her two sons, where, like Darwin, they like hunting for sea-mice.

Megan Davey

Andy Oates

After undergraduate studies at the University of Adelaide, Andrew Oates received his Ph.D. at the Ludwig Institute for Cancer Research and the University of Melbourne. His postdoctoral time was at Princeton University and the University of Chicago in the lab of Robert Ho, where his studies on the segmentation clock in zebrafish began in 1998. In 2003 he moved to Germany and started his group at the Max Planck Institute for Molecular Cell Biology and Genetics in Dresden. In 2012 he accepted a position at University College London as Professor of vertebrate developmental genetics and moved his group to the MRC-National Institute for Medical Research at Mill Hill in London. Their office space can be found at Euston Tap. The Oates group studies a population of coupled genetic oscillators in the vertebrate embryo termed the segmentation clock. This system drives the rhythmic, sequential, and precise formation of embryonic body segments, exhibiting rich spatial and temporal phenomena spanning

"To my fellow postdocs, please do not hesitate to contact me with any suggestions or comments. I will endeavour to address them with the committee."

from molecular to tissue scales. The group is composed of biologists, engineers, and physicists using molecular genetics, quantitative imaging, and theoretical analysis.

Andy Oates

Michelle Ware

Greetings from Rennes, in Brittany. I am extremely excited to have the opportunity to represent the BSDB postdoctoral community. I am a Developmental Neurobiologist now in my second postdoctoral fellowship working with Valérie Dupé at the Institute of Genetics and Development in Rennes, France. Having completed my Ph.D. at the University of Portsmouth with Frank Schubert, I moved to my first postdoc at St Jude Children's Research Hospital in Memphis with Xinwei Cao. I have worked on brain development projects to understand neurogenesis and axon growth, with the focus of my current research on the Notch/proneural network. Using the chick and mouse model organisms, I have identified novel proneural target genes that are expressed throughout neural cells in the developing embryo. Currently, I am investigating the regulation of these target genes by proneural transcription factors.

To my fellow postdocs, please do not hesitate to contact me with any suggestions or comments. I will endeavour to address them with the committee. I encourage you all to invite your colleagues to join the BSDB, follow 'The Node' on Twitter or Facebook and check the website regularly for many interesting posts and discussions. I look forward to hearing from you and meeting many of you at the BSDB meetings.

Michelle Ware

A postdoc report from RIKEN by Stephen Freeman

Another year goes by, and that means the time has come for another BSDB winter newsletter. This one is going to be a bit of a mix of various things that have happened over the past 12 months, so be warned, it is all a little bit random, and could well go a bit “James Joyce”.

First up, as I write this I am sat in a very empty apartment, having just moved from Japan to **Belgium** to start a new postdoc position at the University of Liege. I was supposed to buy a sofa today, but instead I ended up returning to my apartment with a giant bag of waffles, so I think I am integrating nicely. I feel like I should be more upset about the failed sofa shopping, but these waffles are so great that sitting on the floor is barely even noticeable. And anyway, it is superb to be back in Europe, only a short train journey away from good old Blighty.

The move to Belgium has highlighted the same hurdles I faced when I first got to Japan, the biggest of which by far is the language barrier. It’s funny how you forget these early challenges. By the end of my time in Japan I was in no way fluent, but I had learned enough of the language that it was no longer a huge issue. So being thrown once again into a new language was a pretty big shock to the system, and I have spent the first weeks here in Belgium frantically trying to awaken my high school French from its slumber inside my brain. Unfortunately, so far most of what I have awoken is vocabulary related to swimming pools, which is proving pretty difficult to shoehorn into lunchtime small talk.

I am very sad to have left Japan. It is a beautiful country full of wonderful people. The **RIKEN CDB** is a fantastic place - full of amazing scientists with brilliant minds, and I was extremely lucky to have worked with them for the past three years. 2014 was a really tough year for the CDB. I’m sure you’re all aware of the publication and subsequent retraction of the **STAP cell papers**, and of the huge media furore that engulfed the CDB as a result. An awful lot has been written about it, some valid, some pure nonsense (of which I will say no more). On the valid side, there have been questions about the ethics and morals of researchers, comments about the negative effects of the increasing pressure to publish high impact papers, and calls for greater training in data handling and presentation. These are important things to think about. Giving them the attention they deserve not only makes us all better scientists, but just as importantly, it will make us be perceived as better scientists. It is always worth remembering that although we as a community know that our research is performed and peer reviewed to a very high standard, it only takes an anomalous case such as STAP to darken the wider perception of research. And that really is something to be concerned about. The heart of science is about communicating our ideas and our results, and if the people we are telling don’t trust us then there’s no point, really.

Finally I would like to talk a little bit about **Yoshiki Sasai**, who was an author on the STAP cell papers and tragically committed suicide during the investigation into scientific misconduct that followed their retraction (of which he was found not-guilty of misconduct). I knew about Dr. Sasai long before I actually met him. I studied *Xenopus* embryogenesis during my Ph.D, and so I read the papers on endoderm induction by Spemann’s organizer that he published during his time as a postdoc in Eddie De Robertis’ lab. When I arrive at the CDB, I didn’t meet Dr. Sasai in person until the first “CDB bar” – a monthly event where everyone gets together and drinks good booze, eats good food and generally has a superb time. Dr. Sasai manned the cocktail bar. His knowledge of cocktail recipes was unbelievable. He seemed to know the recipe for every cocktail you’d ever heard of, plus a whole host of others that you didn’t even know existed. And his precision in mixing them was second to none, which is perhaps unsurprising given his impressive skills in the lab. The list of achievements Dr. Sasai racked up over his career is astonishing. Perhaps most famously he and his team developed 3D tissue assembly techniques that mimic embryonic development with such accuracy that they have been able to generate partial bits of the brain, pituitary gland, and the optic cup: *in vitro* organogenesis – beautiful, and truly pioneering research. His tragic death is a huge loss to his family, his friends, and the scientific community. He will be greatly missed.

Stephen Freeman