

British Society for Developmental Biology,
British Society for Cell Biology and
Japanese Society of Developmental Biologists

Joint Spring Meeting

15th-18th April 2012
University of Warwick UK

Duncan Odom
Erika Sasaki
Kazuo Emoto
Eileen Furlong
Hiroyuki Araki
Helle Ulrich
Anindya Dutta
Julian Blow
Eliot Meyerowitz
Toshihiko Fujimori
Antonio Jacinto
Ryoichiro Kageyama
Toru Hirota
Andrea Musacchio
Jan Loewe
Monica Bettencourt-Dias
Fiona Watt
Gosdana Vunjak-Novakovic
Masayuki Yamato
Keith Barr

Norio Nakatsuji
Denise Barlow
Anton Wutz
Arp Schnittger
Sally Lowell
Berenika Plusa
Josh Brickman
Shosei Yoshida
Tatsuya Hirano
Robin Allshire
Ana Pombo
Juri Rappsilber
Stephan Schulte-Merker
Anna Philpott
Alison Lloyd
Fumio Matsuzaki
Tamotsu Yoshimori
Anton Gartner
Andreas Villunger
Fabrizio d'Adda Di Fagagna

Plenary lectures by

Denis Duboule and Richard McIntosh

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Topics include: Systems biology, DNA replication, Imaging space & time, Cell division, In vitro models of development, Cell growth & differentiation, Chromosome structure & organisation, Cell cycle in development, Cell death, Stem cells


<http://www.bsdb-bsdb-meetings.co.uk/>







Scientific organisers: James Briscoe, Kim Dale, Helfrid Hochegger, Malcolm Logan, Andrew McAinsh, Tomoyuki Tanaka, Naoto Ueno

BSCB/BSDB/JSDB Joint Spring Meeting - Draft Programme 2012



Sunday 15 April 2012

1400 – 1430	BSCB/BSDB Joint Officers' Meeting - Ensemble Room	
1400 – 1800	Registration – Rootes Reception	
1430 – 1830	BSDB committee meeting – Ensemble Room	BSCB committee meeting - Studio
1800 – 1930	Dinner - Rootes Building	
1930 – 2030	Main Theatre -The EMBO Lecture - Denis Duboule PL1 Federal Institute of Technology, Lausanne, and Dept of Genetics and Evolution, Geneva, Switzerland The vertebrate Hox clock Chair: Malcolm Logan <div>Kindly sponsored by </div>	
2030 – 2130		Main Theatre – BSCB Garland Plenary Lecture - Richard McIntosh PL2 J, MCD Biology, University of Colorado, Boulder, USA Microtubule tips as mechanochemical devices Chair: Tomoyuki Tanaka, Helfrid Hochegger
2130 onwards	Student and Post Doc Social: Chancellors Suite, Rootes Building	


Monday 16 April 2012

0800 – 1800	Registration – Arts Centre	
Session 1:	BSDB – Systems biology: NGS analysis of development Chair: Jim Smith Main Theatre	BSCB – DNA replication Chair: Phillip Zegerman, Hiroyuki Araki Cinema
0900 – 0930	S1 Duncan Odom, Cambridge Cancer Research Institute, University of Cambridge, UK Mechanism and evolution of transcriptional regulation in mammals Kindly sponsored by 	S5 Hiroyuki Araki, National Institute of Genetics, Mishima, Japan Initiation mechanism of chromosome replication
0930 – 0945	O1 SP Herbert - H2.0-like homeobox-1 determines endothelial stalk versus tip cell potential during sprouting angiogenesis	O3 T Natsume - Cdc7-Dbf4 kinase localizes to kinetochores and facilitates early replication of centromeres in budding yeast
0945 – 1015	S2 Erika Sasaki, Central Institute for Experimental Animals, Kawasaki, Japan Future prospects for utilizing transgenic marmoset in biomedical research	S6 Julian Blow, University of Dundee, UK Strategies to ensure robustness in genome replication
1015 – 1045	Refreshment break and exhibition viewing time – Arts Centre	
1045 – 1115	S3 Kazuo Emoto, Osaka Bioscience Institute, Osaka, Japan How do neurons take their shape?	S7 Anindya Dutta, University of Virginia, USA Extrachromosomal microDNAs and chromosomal microdeletions in normal tissues
1115 – 1130	O2 N Sasai - FGF regulates the competence of the neural progenitor cells in the differentiation of the floor plate	O4 P Zegerman - SLD-2 is an essential CDK target required for replication initiation in <i>C. elegans</i>
1130 – 1200	S4 Eileen Furlong, EMBL Heidelberg Germany Understanding and predicting cis-regulatory activity	S8 Helle Ulrich, CRUK, London, UK Functions of ubiquitin and SUMO in DNA damage bypass
1200 – 1400 1230 - 1330	Lunch and exhibition viewing time – Arts Centre Lunchtime Workshop: Panel of PIS describing the do's and don'ts and the many alternative routes to the academic career path (Cinema)	
Session 2:	BSDB – Imaging space and time in development Chair: David Ish Horowitz Cinema	BSCB – Cell division Chair: Viji Draviam, Masanori Mishima Main Theatre
1400 – 1430	S9 Elliot Meyerowitz, California Institute of Technology USA, Sainsbury Laboratory, Cambridge University, UK Cell-cell communication via both chemical and mechanical signals regulates plant morphogenesis Kindly sponsored by 	S13 Toru Hirota, Cancer Institute, Foundation for Cancer Research, Tokyo, Japan Dual functions of separase ensure switch-like initiation of anaphase
1430 – 1445	O5 S Yoshida - Flow sensing by cilia in the mouse embryonic node	O7 JBA Millar - Phospho-dependent recruitment of Bub1 and Bub3 to Spc7/KNL1 by Mph1 kinase is required to maintain the spindle checkpoint
1445 – 1515	S10 Toshihiko Fujimori, National Institute for Basic Biology, Okazaki, Japan Cell polarity and morphogenesis of the mouse oviduct	S14 Andrea Musacchio, MPI Dortmund, Germany How kinetochores control mitotic progression
1515 – 1545	Refreshment break and exhibition viewing time – Arts Centre	
1545 – 1615	S11 Antonio Jacinto, Instituto de Medicina Molecular Lisbon Portugal How Epithelia respond to a crisis	S15 Monica Bettencourt-Dias, Instituto Gulbenkian de Ciência, Portugal Centriole and cilia biogenesis Kindly sponsored by 
1615 – 1630	O6 GA Stooke-Vaughan - The Role of Hair Cells and Cilia in Otolith Formation in the Zebrafish Otic Vesicle	O8 F Gergely - A CEP63-CEP152 protein complex promotes centrosome duplication and determines human brain size
1630 – 1700	S12 Ryoichiro Kageyama, Institute for Virus Research. Kyoto University. Kyoto, Japan Uladian rhythms in somite segmentation and other biological events	S16 Jan Löwe, LMB, Cambridge, UK ParM filament sliding and unidirectional elongation leads to bipolar plasmid segregation
1700 – 1800		M1 BSCB: Hooke Medal Talk – Holger Gerhardt Cell competition and cooperation in vascular networks Chair : Jordan Raff
1800 – 1845		BSDB AGM
1845 – 1930		BSCB AGM
1900 – 2030	Dinner – Rootes Building	
2030 – 2200	Drinks reception with poster session I (odd numbered posters to be presented) and exhibition viewing time – Arts Centre Kindly sponsored by 	

Tuesday 17 April 2012

0800 – 1800	Registration – Arts Centre	
Session 3:	BSDB – Cell cycle and growth in development Chair: David Whitmore	BSCB – Cell growth / Differentiation Chair: Arp Schnittger, Anton Wutz
0900 – 0930	S17 Buzz Baum, MRC LMCB UCL, London, UK Cell division in isolation and in a tissue context	S21 Norio Nakatsuji, Institute for Integrated Cell-Material Sciences, Kyoto University, Kyoto, Japan Chemical control of human pluripotent stem cell differentiation and creation of neurodegenerative disease model cells Kindly sponsored by 
0930 – 0945	O9 P Aanstad - Cxcr4a determines the proliferative response to Hedgehog signaling	O11 S Suzuki - Effects of chromatin remodeling factor Chd1 on in vitro differentiation of mouse preimplantation embryos
0945 – 1015	S18 Anna Philpott, University Cambridge Department Oncology, UK Regulation of division versus differentiation during neurogenesis by multi-site post-translational modification	S22 Anton Wutz, CSCR Cambridge, UK Derivation of haploid embryonic stem cell lines from mouse embryos
1015 – 1045	Refreshment break and exhibition viewing time – Arts Centre	
1045 – 1115	S19 Alison Lloyd, MRC LMCB UCL, London, UK Switches in proliferative state in the regenerating nervous system	S23 Denise Barlow, CeMM, Vienna Macro ncRNAs in imprinted gene clusters in the mouse and human genome
1115 – 1130	O10 R Laranjeiro - A new link between the zebrafish circadian clock and cell cycle timing	O12 R Nakamura - Antagonistic relationship between histone and DNA methylation in long-term regulation of <i>zic1/zic4</i> , key regulators of vertebrate body patterning
1130 – 1200	S20 Fumio Matsuzaki, RIKEN CDB, Kobe, Japan Self-renewal and transitions in division mode of cortical neural stem cells	S24 Arp Schnittger, Institut de Biologie Moléculaire des Plantes du CNRS Strasbourg/France Cdk1-independent cell-cycle control in flowering plants
1200 – 1330 1300 – 1400	Poster session II (Even numbered posters to be presented) Lunch and exhibition viewing time – Arts Centre Lunchtime Workshop - Improving image resolution and signal noise with Huygens deconvolution Scientific Volume Imaging (SVI) (Cinema) Kindly sponsored by 	
Session 4:	BSDB – Stem cells and cell fate choice / Lineage specification Chair: Alfonso Martinez Arias	BSCB – Chromosome structure / organization Chair: Ana Pombo, Juri Rappsilber
1400 – 1430	S25 Sally Lowell, MRC Centre of Regenerative Medicine Edinburgh, UK Priming pluripotent cells for differentiation	S29 Tatsuya Hirano, RIKEN, Wako, Japan Condensins and evolutionary insights into chromosome condensation
1430 – 1445	O13 MP Stavridis - Regulation of embryonic stem cell differentiation progression by post-translational modification with β -O-GlcNAc	O15 B Akiyoshi - Identification of kinetochore proteins in <i>Trypanosoma brucei</i>
1445 – 1515	S26 Berenika Plusa, University of Manchester, UK Sorting out cell fate in the mouse blastocyst	S30 Juri Rappsilber, University of Edinburgh, UK, Technische Universität, Berlin Structural biology by mass spectrometry: 3D proteomics of supramolecular assemblies
15.15 – 15.45	Refreshment break and exhibition viewing time – Arts Centre	
1545 – 1615	S27 Josh Brickman, MRC Centre of Regenerative Medicine, Edinburgh, UK Intrinsic lineage priming and potency in embryonic stem cells	S31 Robin Allshire, University of Edinburgh, UK Rebooting and preventing the assembly of centromeric chromatin
1615 – 1630	O14 T Butts - Transit amplification in the amniote external granule layer evolved via <i>cis</i> regulatory evolution of the neurogenic transcription factor, <i>NeuroD1</i>	O16 JM Bancroft - CENP-Q promotes depolymerization of kinetochore-microtubules to drive chromosome alignment
1630 – 1700	S28 Shosei Yoshida, National Institute for Basic Biology, Okazaki Japan In vivo behavior of the mouse spermatogenic stem cells	S32 Ana Pombo, MRC Clinical Sciences Centre, UK RNA polymerase II interactome at different stages of the transcription cycle
1700 – 1730	M2 BSDB Beddington Medal – Boyan Bonev microRNA-9 promotes neural progenitor diversity in space and time Chair: Kim Dale	
1730 – 1830	M3 Waddington Medal - Main Theatre Chair - Liz Robertson	
1830 – 1930	Graduate symposium- Main Theatre Chair: Denis Duboule	
1830 – 1850	D Verleyen - Orphan Gpr22 is involved in left-right axis determination in zebrafish	
1850 - 1910	D McIntosh - Replication Factory Regulation in Normal and Cancer Cells	
1910 - 1930	K Bai - The molecular genetics of epithelial cell morphogenesis	
2000 onwards	Conference Dinner – Panorama Suite - Rootes Building	

Wednesday 18 April 2012

0800 – 1200	Registration – Arts Centre	
Session 5:	BSDB – In vitro models of developmental biology Chair: Kate Storey Main Theatre	BSCB – Cell death / senescence Chair: Pascal Meier, Anton Gartner Cinema
0900 – 0930	S33 Keith Baar, University of California, Davis, California, USA The role of tension in the development of tendons and ligaments	S37 Fabrizio d'Adda di Fagagna, , IFOM Milan, Italy Molecular mechanisms of cellular senescence
0930 – 0945	O17 DG Wilkinson - Molecular and cellular mechanisms of boundary formation by Eph receptor and ephrin signalling	O19 C Turnbull - Investigating the role of RNA sequence and structure in apoptosis-dependent RNA cleavage
0945 – 1015	S34 Andrea Vortkamp, Developmental Biology, University Duisburg-Essen, Essen, Germany The zinc finger protein Trps1 regulates chondrocyte differentiation and cell cycle progression by modulating chromatin acetylation	S38 Anton Gartner, Wellcome Trust for Gene Expression, University of Dundee, UK Holliday junction resolution/processing in <i>C. elegans</i> . DNA damage signaling, apoptosis and meiosis
1015 – 1045	Refreshment Break – Arts Centre	
1045 – 1115	S35 Masayuki Yamato, Institute of Advanced Biomedical Engineering and Science Tokyo Women's Medical University, Japan Tissue reconstruction with cell sheet engineering for regenerative medicine Kindly sponsored by 	S39 Pascal Meier, Institute of Cancer Research, London Ubiquitin-mediated regulation of cell survival
1115 – 1130	O18 CJ Sampson - <i>In vitro</i> to <i>ex vivo</i> , A novel system for the study of primary cell behaviour: the role of ecdysone in <i>Drosophila</i> haemocyte motility	O20 JV Beira - Characterisation of apoptosis pathways responsible for the maintenance of tissue homeostasis
1130 – 1200	S36 Fiona Watt Cancer Research UK Cambridge Research Institute and Wellcome Trust Centre for Stem Cell Research, Cambridge, UK Epidermal stem cells–niche interactions at single cell resolution	S40 Tamotsu Yoshimori , Osaka University, Osaka, Japan Autophagy: Molecular machinery and role in diseases
1200 – 1400	Packed lunch & delegates depart	



BSCB/BSDB/JSDB Joint

Spring Meeting

15-18th April 2012

University of Warwick

The BSDB held their 2012 spring meeting jointly with the British Society for Cell Biology (BSCB) and the Japanese Society for Developmental Biology (JSDB). Members of all three organisations travelled to the University of Warwick to learn about and discuss new developments in the field.

The meeting began on the 15th April with the EMBO lecture from Denis Duboule. Denis discussed the vertebrate *Hox* clock, suggesting why *Hox* genes are regulated in *cis* while many other ‘clocks’ are regulated in *trans*. He also presented a model for *Hox* gene activation in which the cluster is thought of as a rosary, with genes (or beads) being moved from a closed conformation to an open one (like being passed hand to hand). Richard McIntosh then presented the BSCB Garland Plenary Lecture, addressing the role of microtubule tips as mechano-chemical devices within the cell. It was intriguing that the microtubule tip is now considered a molecular engine not only during polymerisation, as has always been classically recognised, but also during depolymerisation, in which coupler proteins can meaningfully transduce forces generated by bending protofilaments.

The opening day was concluded with a social (but hotly contested!) student and post-doc pub quiz, organised by the BSDB and BSCB student committee representatives Jorge Beira and Kimberley Bryon-Dodd. The quiz was great fun and gave everyone a chance to break the ice over a few social drinks.

The first full seminar session of the conference began with a lively and thoroughly interesting talk delivered by Duncan Odom on the evolution of mammalian gene regulation. Dr Odom stipulated that canonical transcription factor binding sites are mobile and may not be as evolutionarily conserved as previously thought. The session focused on Next Generation Sequencing (NGS) and was chaired by Jim Smith, covering a range of topics from the use of GFP-expressing marmosets as non-human primate genetic models to general principles of *cis* regulatory control in development. Collectively the talks exemplified

the wealth of opportunities that NGS is offering the field of developmental biology.

A unique opportunity was granted to PhD students and post-docs alike in Monday’s lunchtime workshop, which saw established PIs at a range of stages in their careers giving a rare insight into how they had reached their current position, coupled with snippets of advice and pearls of wisdom for early-career scientists. Chaired by Kim Dale, grateful attendees took full advantage to ask questions regarding when and where to take post-doc and faculty positions and the timeless ‘how do I know I’m cut out for research’. The panel also answered concerns of raising a family whilst pursuing a full time research career and how to go about negotiating ownership of projects when establishing your own lab.

The afternoon session of talks covered the topic of imaging space and time in development. Elliot Meyerowitz presented an engaging talk on understanding how plant cells communicate in the shoot apical meristem. Using live imaging, genetic alterations and computational modelling, he demonstrated that a combination of stress patterns and hormone transport are able to influence cell polarity and thus influence plant growth. Toshiaki Fujimori then spoke about oocyte transport along the mouse oviduct. Ciliary beating maintains the unidirectional flow of the oocyte, and it appears that the PCP regulator *Celsr1* plays a crucial role in the organisation of these cilia in order to coordinate the flow of the oocyte. Besides these, other speakers also showed how imaging has been used to study wound healing, organ development, and trunk segmentation, allowing the audience to marvel at how microscopy and photography can capture developmental processes in all their glory.

The day’s talks ended with the Hooke Medal Talk by Holger Gerhardt. This was an excellent showcase of how developmental and cell biology has come together. Vascular patterning and branching have traditionally been described in a “tip and stalk cell” fashion, with cells at a leading edge assuming the role of tip cells in order to permit branching of the vascular tissue. We learned that this dogmatic idea is starting to be dismantled, with *in vivo* imaging showing that tip and stalk cells shuffle around regularly, leading to the novel concept that vascular sprouting should perhaps be thought of as collective



instead of individual cell behaviour.

A poster session and drinks reception took place in the evening, allowing attendees to mingle and discuss one another's work in an informal and friendly setting.

The following day began with a session of talks on the theme of cell cycle and growth in development. The changes that occur in cell shape during animal cell division were discussed by Buzz Baum in a great talk addressing the molecular and physical processes that drive these changes, known as 'rounding up'. Other talks in the session included Pia Aanstad introducing hedgehog signalling in the zebrafish retina, and Alison Lloyd addressing regeneration in the mammalian nervous system. Concurrently, our BSCB counterparts held a series of talks on cell growth and differentiation, which covered a wide range of topics, from exciting new stem cell technologies to cell cycle control and genomic imprinting. In particular, Denise Barlow brought the audience on an intriguing tour of her group's work on transcriptional regulation by long non-coding RNAs. Following a lunchtime poster session and workshop on image resolution, talks on the theme of stem cells and cell fate choice were presented. Berenika Plusa presented her work on lineage formation in the early blastocyst, using chimera assays to investigate plasticity in the epiblast and primitive endoderm. Josh Brickman and Sally Lowell also gave interesting talks concerning the priming of embryonic stem cells to steer them towards certain lineages. On a more evolutionary theme, Thomas Butts discussed the neurogenic transcription factor, NeuroD1 and introduced a novel enhancer element which has diverged in structure and activity between amniotes and anamniotes.

Boyan Bonev received the BSDB Beddington Medal for the best PhD thesis in developmental biology, and presented his work on the role of the microRNA miR-9 in neural development. The Waddington medal was awarded to Alfonso Martinez Arias, who

gave an inspiring talk that looked back on his career in research to thank all those who he had worked with over his years. The presentation was set against the wider context of global affairs from the 60's to present day and ended with a brilliant montage-animation of developmental events. Medal awards were followed by the graduate symposium, which allowed three PhD students; Daphne Verleyen, Debbie McIntosh and Keliya Bai, to present their thesis work to a mainly student audience.

The day was brought to a close with the conference dinner. Excellent food and service was provided by the University of Warwick and the opportunity was taken to hand out substantial prizes for the best talks and posters. The dinner was followed by a disco and then a sensational after party, which saw students, post-docs and PIs networking merrily into the wee hours!

On the final day of the conference, a number of in vitro models of developmental biology were presented. Keith Barr discussed his work using an in vitro system to study the influence of various growth factors on tendon development. David Wilkinson then introduced an in vitro model of cell segregation and boundary formation used to study Eph receptor and Ephrin signalling. Closing the conference, Fiona Watt discussed the epidermal stem cell niche and how stem cells can be studied in vitro to establish their responses to individual signals. Many messages of thanks were made to everyone who played a role in organising the conference, and another successful BSDB meeting was brought to a close.

Haihan Tan-Kings College London

Sorrel Bickley-NIMR

Martin Carkett-NIMR

lunchtime workshop panelists

(from L-R)

Sally Lowell,

Denis Duboule,

Jim Smith, Claudio

Stern and Naoto

Ueno

