

Tuesday, June 26th 2018

Bailey Allen Hall

18:20 -19:00

K1

Keynote Lecture 1

Mark Martindale, USA

A developmental explanation for the "Cambrian Explosion"?

Kindly Supported by:



Centre for Research in Medical Devices

Wednesday, June 27th 2018

Bailey Allen Hall

09:00 – 10:40 Symposium S1

Novelties in cell type evolution

Organisers and Chairs: Detlev Arendt, Gaspar Jekely, Jacob Musser

09:00 – 09.25

S1.1

Evolution of the neuromuscular junction – Function and innervation of epithelio-muscle cells in the anthozoan *Nematostella vectensis*

Sabrina Kaul-Strehlow, University of Vienna, Vienna, Austria

09:25 – 09:50

S1.2

Gene regulatory network approaches for studying cell type evolution

Maria Ina Arnone, Stazione Zoologica Anton Dohrn, Naples, Italy

09:50 – 10:15

- S1.3** A novel cell type identity evolved from the cellular stress response
Gunter Wagner, Yale University, New Haven, USA

10:15 – 10:40

- S1.4** Choanoflagellates and the evolutionary origin of proto-synaptic signalling machineries
Pawel Burkhardt, Sars International Centre for Marine Molecular Biology, Bergen, Norway

Human Biology Room 1

09:00 – 10:40 Symposium S2

Evo-devo of colour pattern formation

Organiser and Chair: Claudius Kratochwil

09:00 – 09:25

- S2.1** How did the butterfly get its colours? The evolution and genetics of colour and pattern in *Heliconius* butterflies
Nicola Nadeau, University of Sheffield, Sheffield, United Kingdom

09:25 – 09:50

- S2.2** The developmental basis of pigment pattern evolution in rodents
Ricardo Mallarino, Princeton University, Princeton, USA

09:50 – 10:15

- S2.3** Life in technicolor: The evolution of pigmentary pathways in vertebrates
Ingo Braasch, Michigan State University, East Lansing, MI, USA

10:15 – 10:40

S2.4 Developmental genetic bases of pigment pattern diversification in *Danio* fishes

David M. Parichy, Department of Biology, University of Virginia, Charlottesville VA, USA

Human Biology Room 2

09:00 – 10:40 **Symposium S3**

Phenotypic robustness, fluctuations and plasticity

Organiser and Chair: Kunihiko Kaneko

09:00 – 09:25

S3.1 Variational properties in a developmental system with six precursor cells

Marie-Anne Felix, IBENS, Paris, France

09:25 – 09:50

S3.2 “Cost of complexity” contributed to the vertebrate bodyplan conservation?

Naoki Irie, University of Tokyo, Tokyo, Japan

09:50 – 10:15

S3.3 Theory for direction and constraint in phenotypic evolution

Kunihiko Kaneko, University of Tokyo, Tokyo, Japan

10:15 – 10:40

S3.4 Mistranslation and the Evolution of Robustness

Sinisa Bratulic, Broad Institute of MIT and Harvard, Cambridge, USA

The View

09:00 – 10:40 Symposium S4

Evolution of developmental patterning within a plant organ

Organiser and Chair: Beverley Glover

09:00 – 09:25

S4.1 Evolution of the carpel gene regulatory network in angiosperms
Charlie Scutt, Ecole Normale Supérieure de Lyon, Lyon, France

09:25 – 09:50

S4.2 Interspecific variation leaf form
Catherine Kidner, University Of Edinburgh, Edinburgh, United Kingdom

09:50 – 10:15

S4.3 Nature's palette: understanding the mechanisms of petal patterning
Edwige Moyroud, The Sainsbury Laboratory, University of Cambridge, Cambridge, United Kingdom

10:15 – 10:40

S4.4 A thorny question: the regulation of stem cell activity
Vivian Irish, Yale University, New Haven, CT, USA

Bailey Allen Hall

11:10 – 12:25 Contributed Session C1

Novelties in cell type evolution

Chairs: Detlev Arendt, Gaspar Jekely, Jacob Musser

11:10 – 11:25

C1.1 The co-existence of ciliary and microvillar features in photoreceptor cells

Harald Hausen, University of Bergen, Bergen, Norway

11:25 – 11:40

C1.2 Transcriptomic characterization of cup cells, an evolutionary novel cell type in Dictyostelid cellular slime molds

Koryu Kin, University of Dundee, Dundee, United Kingdom

11:40 – 11:55

C1.3 Extra-ocular, rod-like photoreceptors in a flatworm

Kate Rawlinson, Wellcome Trust Sanger Institute, Cambridge, United Kingdom

11:55 – 12:10

C1.4 Insights into the origin of postsynaptic signalling machineries from choanoflagellates

Tarja T. Hoffmeyer, Marine Biological Association of the United Kingdom, Plymouth, United Kingdom

12:10 – 12:25

C1.5 The genetics of cranial sensory ganglia development and evolution

Vasileios Papadogiannis, University of Oxford, Oxford, United Kingdom

Human Biology Room 1

11:10 – 12:25 Contributed Session C2

Eco-Evo-Devo 1

Chairs: Kevin Parsons, Craig Albertson

11:10 – 11:25

C2.1 Shaping the craniofacial skeleton: Surprising roles for musculoskeletal feedback

Andrew Conith, University of Massachusetts Amherst, Amherst, USA

11:25 – 11:40

C2.2 The clownfish *Amphiprion ocellaris*: a model to study coral reef fish metamorphosis

Natacha Roux, BIOM, CNRS, UMR7232, Banyuls sur mer, France

11:40 – 11:55

C2.3 Cavefish metabolic adaptation: Hungry, fat, and healthy

Nicolas Rohner, Stowers Institute for Medical Research, Kansas City, USA

11:55 – 12:10

C2.4 Combined effects of day and night temperature on thermally plastic traits

Yara Rodrigues, Instituto Gulbenkian de Ciência, Oeiras, Portugal

12:10 – 12:25

C2.5 A large evolve-and-resequence experiment reveals a trade-off between (immune) defense and developmental speed in insect eggs

Maurijn van der Zee, Institute of Biology, Leiden University, Leiden, The Netherlands

Human Biology Room 2

11:10 – 12:25 Contributed Session C3

Mechanisms of gene regulatory network evolution 1

Chairs: Paola Oliveri, Maria Ina Arnone

11:10 – 11:25

C3.1 Evolution and function of young homeobox genes in mammalian preimplantation development

Amy Royall, University of Oxford, Oxford, United Kingdom

11:25 – 11:40

C3.2 Evolutionary recruitment of flexible Esrp-dependent splicing networks into diverse embryonic morphogenetic processes

Manuel Irimia, Centre for Genomic Regulation, Barcelona, Spain

11:40 – 11:55

C3.3 Context dependent regulatory divergence in closely related *Drosophila* species

Nico Posnien, Department of Developmental Biology, Georg-August-University Göttingen, Göttingen, Germany

11:55 – 12:10

C3.4 MADS about how plants conquered the land: when did MIKC-type transcription factors learn to constitute quartets?

Florian Rümpler, Friedrich Schiller University Jena, Matthias Schleiden Institute, Department of Genetics, Jena, Germany

12:10 – 12:25

C3.5 The ancestral retinoic acid receptor was a low-affinity sensor triggering neuronal differentiation

Michael Schubert, Laboratoire de Biologie du Développement de Villefranche-sur-Mer, Villefranche-sur-Mer, France

The View

11:10 – 12:25 Contributed Session C4

Physico-genetics of Evo-Devo

Chair: Stuart Newman, Gerd Müller

11:10 – 11:25

C4.1 Phenotypic plasticity requires robust distribution of phenotypes and robust responsiveness to environment

Bogdan Sieriebriennikov, Max Planck Institute for Developmental Biology, Tuebingen, Germany

11:25 – 11:40

C4.2 Evo-devo principles in the evolution of complex phenotypes

Isaac Salazar Ciudad, University of Helsinki, Helsinki, Finland

11:40 – 11:55

C4.3 Testing the ancestral role of β -catenin in ctenophores: cell adhesion, cell fate specification, or both/neither?

Miguel Salinas-Saavedra, Whitney Laboratory for Marine Bioscience - University of Florida, St. Augustine, USA

11:55 – 12:10

C4.4 How to build complex, robust and evolvable body plans in evolution: a view from development

Pascal Hagolani, University of Helsinki, Helsinki, Finland

12:10 – 12:25

C4.5 Plasticity has shaped the organisation of the honeybee genome.

Peter Dearden, Genomics Aotearoa, Dunedin, New Zealand

Bailey Allen Hall

14:00 – 15:40 Symposium S5

Single-cell RNA-seq: a powerful new approach for understanding the evolution of development

Organiser and Chair: Christopher E. Laumer

14:00 – 14:25

S5.1 Defining cell type transcriptomes of the planarian *Schmidtea mediterranea*

Christopher Fincher, Whitehead Institute for Biomedical Research, Cambridge, USA

14:25 – 14:50

S5.2 Early metazoan cell type diversity and the evolution of multicellular gene regulation

Arnau Sebe-Pedros, Weizmann Institute of Science, Rehovot, Israel

14:50 – 15:15

S5.3 Single-cell RNA sequencing of mouse and human *Plasmodium* malaria parasites throughout the host and mosquito stages.

Mara Lawniczak, Sanger Institute, Hinxton, United Kingdom

15:15 – 15:40

S5.4 A single-cell resolution catalogue of the developing root

Carlos Ortiz Ramirez, New York University, New York, USA

Human Biology Room 1

14:00 – 15:40 Symposium S6

Eco-Evo-Devo

Organisers and Chairs: Kevin Parsons, Craig Albertson

14:00 – 14:25

S6.1 Ancestral plasticity: rate, pattern and process
Susan Foster, Clark University, Worcester, USA

14:25 – 14:50

S6.2 Adaptive transgenerational inheritance of nematodes in dung beetles
Cristina Ledon-Rettig, Indiana University, Bloomington, USA

14:50 – 15:15

S6.3 Adaptive and genetic basis of an exaggerated secondary sexual trait
Abderrahman Khila, IGFL, ENS de Lyon, France, Lyon, France

15:15 – 15:40

S6.4 EcoEvoDevo and quantitative traits
Ehab Abouheif, McGill University, Canada, Canada

Human Biology Room 2

14:00 – 15:40 Symposium S7

Developmental properties driving speciation

Organiser and Chair: Rainer Melzer

14:00 – 14:25

S7.1 How are morphologically distinct populations generated and maintained within a species?
Beverley Glover, University of Cambridge, Cambridge, United Kingdom

14:25 – 14:50

- S7.2** Floral diversification in Proteaceae: unravelling the genetic and developmental mechanisms underpinning symmetry transitions
Sophie Nadot, University Paris-Sud, Orsay, France

14:50 – 15:15

- S7.3** Floral evolution and speciation in florally diverse *Jaltomata*
Jamie Kostyun, The University of Vermont, Burlington, USA

15:15 – 15:40

- S7.4** Developmental and genetic basis of genital divergence between two species of *Drosophila*
Maria Daniela Santos Nunes, Oxford Brookes University, Oxford, United Kingdom

The View

14:00 – 15:40 Symposium S8

Inherency in development and evolution

Organisers and Chairs: Gerd Müller and Stuart Newman

14:00 – 14:25

- S8.1** Animal bodies originated via the inherent properties of novel biological forms of matter
Stuart Newman, New York Medical College, Valhalla, NY, USA

14:25 – 14:50

- S8.2** Evolution of a Hes1-regulated lectin-based self-organizing mechanism of limb development
Ramray Bhat, Indian Institute of Science, Bangalore, India

14:50 – 15:15

- S8.3** Possible shapes in plants meristems, leaf primordia and their arrangements
Stéphane Douady, MSC Lab CNRS / Univ Paris-Diderot, Paris, France

15:15 – 15:40

- S8.4** Inherency in the development and evolution of multicellular structures in microbial organisms
Mariana Benítez, Universidad Nacional Autónoma de México, Mexico City, Mexico

Bailey Allen Hall

16:10 – 17:10 Contributed Session C5

Single-cell RNA-seq: a powerful new approach for understanding the evolution of development

Chair: Christopher E. Laumer

16:10 – 16:25

- C5.1** Using single-cell technologies and planarians to study stem cells, their differentiation and their evolution.
Jordi Solana, Department of Biological and Medical Sciences, Oxford Brookes University, Oxford, United Kingdom

16:25 – 16:40

- C5.2** A transcriptional view of cell type diversity in the cnidarian *Hydractinia symbiolongicarpus* using InDrop single cell RNA-sequencing
Sebastian G. Gornik, NUI Galway, Galway, Ireland

16:40 – 16:55

- C5.3** Comparative single-cell developmental transcriptomics in the hemichordate *Saccoglossus kowalevskii*
Jessica Gray, Harvard Medical School, Boston, USA

16:55 – 17:10

- C5.4** Uncovering cell type complexity in *Xenoturbella bocki* using whole organism single cell sequencing
Helen Robertson, University College London, London, United Kingdom

Human Biology Room 1

16:10 – 17:10 Contributed Session C6

Evo-devo of colour pattern formation

Chair: Claudius Kratochwil

16:10 – 16:25

- C6.1** Agouti-related peptide 2 drives convergent evolution of stripe patterns across cichlid fish radiations
Claudius Kratochwil, University of Konstanz, Konstanz, Germany

16:25 – 16:40

- C6.2** Wnt signalling is a key driver of pattern specification and diversification in the butterflies
Joseph Hanly, George Washington University, Washington DC, USA

16:40 – 16:55

- C6.3** Hormonally induced heterochronies as guide to the evolution of the Middle American cichlids pigment pattern.
Fedor Shkil, 1. Severtsov Institute of Ecology and Evolution, RAS, Moscow, Russian Federation

16:55 – 17:10

- C6.4** Single wholesale pathway co-option underlies massive embryonic colour diversification in water striders.
Aidamalia Vargas Lowman, Institut de génomique fonctionnelle de Lyon, Lyon, France

Human Biology Room 2

16:10 – 17:10 Contributed Session C7

Developmental properties driving speciation

Chair: Rainer Melzer

16:10 – 16:25

- C7.1** Developmental basis of beak shape evolution in Darwin's finches
Mariya Dobрева, Imperial College London, London, United Kingdom

16:25 – 16:40

- C7.2** The history of the Wnt family in chordates has been governed by conservative cephalochordates and liberal ascidians
Ildiko Somorjai, BSRC, University of St Andrews, St Andrews, United Kingdom

16:40 – 16:55

- C7.3** New environments, new shapes! Developmental plasticity reveals divergent phenotypic states in the fish *Megaleporinus macrocephalus*.
Tiana Kohlsdorf, University of Sao Paulo, Ribeirao Preto, Brazil

16:55 – 17:10

- C7.4** Developmental mechanisms of Arctic Charr adaptive divergence
Sigrídur Rut Franzdóttir, University of Iceland, Institute of Life and Environmental Sciences, Reykjavik, Iceland

The View

16:10 – 17:10 Contributed Session C8

Evolution of developmental patterning within a plant organ

Chair: Beverley Glover

16:10 – 16:25

C8.1 FRUITFULL: interplay between conservation and divergence to shape *Cardamine hirsuta* fruit.

Anahit Galstyan, Department of Comparative Development and Genetics, Max Planck Institute for Plant Breeding Research, Cologne, Germany

16:25 – 16:40

C8.2 Genetic basis of leaf form diversity in the mustards

Lachezar Nikolov, Max Planck Institute for Plant Breeding Research, Cologne, Germany

16:40 – 16:55

C8.3 The evolution of TTG1-WDR scaffold proteins

Chiara Airoidi, University of Cambridge, Cambridge, United Kingdom

16:55 – 17:10

C8.4 A mathematical model with dorsoventral asymmetry for inter-specific diversity of floral ontogeny

Miho Kitazawa, Osaka University, Toyonaka, Japan

Bailey Allen Hall

17:20 – 18:00

K2

Keynote Lecture 2

Angela Hay

Explosive seed dispersal

Bailey Allen Hall & The Cube

18.00 – 19.45

Poster Session 1 Even Numbers

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Bailey Allen Hall

**20:00 – 21:00 Round table discussion: Scientific Writing and
Publishing**

Thursday 28th June 2018

Bailey Allen Hall

09:00 – 10:40 Symposium S9

Progress and open questions in Spiralian Evo-Devo

Organisers and Chairs: Jose M. Martin-Duran, Christina Grande

09:00 – 09.25

S9.1 Spiral cleavage and the relationship between early developmental processes and the homology of cell types and organs

Andreas Hejnol, Sars International Centre for Marine Molecular Biology, University of Bergen, Bergen, Norway

09:25 – 09:50

S9.2 Cellular and physical mechanisms of spiral cleavage

Mette Handberg-Thorsager, Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG), Dresden, Germany

09:50 – 10:15

- S9.3** Cellular and molecular control of axial elongation in a spiralian embryo, *Crepidula fornicata*
Deirdre Lyons, Scripps Institution of Oceanography, San Diego, USA

10:15 – 10:40

- S9.4** Loss and gain of the trochophore in the evolution of nemertean larval development
Svetlana Maslakova, University of Oregon, Charleston, OR, USA

Human Biology Room 1

09:00 – 10:40 Symposium S10

Going beyond embryos - Evolution of postembryonic development

Organisers and Chairs: Nico Posnien, Micael Reis

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09:00 – 09:25

- S10.1** Adaptation and constraints over development and aging
Marc Robinson-Rechavi, University of Lausanne, Lausanne, Switzerland

09:25 – 09:50

- S10.2** Gene regulatory network architecture in different developmental contexts influences the genetic basis of morphological evolution
Alistair P. McGregor, Oxford Brookes University, Oxford, United Kingdom

09:50 – 10:15

S10.3 Co-ordinating organ growth and patterning in developing Larvae
Christen Mirth, Monash University, Clayton, Australia

10:15 – 10:40

S10.4 Thyroid-hormone regulated metamorphosis a dynamic and plastic process allowing ecological and developmental coupling of life history transitions
Vincent Laudet, Observatoire Océanologique de Banyuls-sur-Mer, Banyuls-sur-Mer, France

Human Biology Room 2

09:00 – 10:40 **Symposium S11**

Developmental constraints in the evolution of plants and animals

Organisers and Chairs: Dmitry Sokoloff, Yulia Krauss

09:00 – 09:25

S11.1 European orchids are less constrained than their reputations suggest
Richard Bateman, Royal Botanic Gardens Kew, Richmond, United Kingdom

09:25 – 09:50

S11.2 Constrained to break free? Developmental and evolutionary mechanisms controlling the floral bauplan.
Rainer Melzer, University College Dublin, Dublin, Ireland

09:50 – 10:15

S11.3 Endless forms, most unconstrained
Thomas Stach, Humboldt Universität zu Berlin, Berlin, Germany

10:15 – 10:40

S11.4 Mechanics and evolution of cell sheet folding – Embryonic inversion in the green algae *Volvox*

Stephanie SMH Höhn, University of Cambridge, Cambridge, United Kingdom

The View

09:00 – 10:40 **Symposium S12**

The role of boundaries in organismal diversification

Organisers and Chairs: Madelaine Bartlett, Chelsea D. Specht

09:00 – 09:25

S12.1 Historical contingency and the origin of tropical-temperate niche transitions in the grass family (Poaceae)

Jill Preston, The University of Vermont, Burlington, USA

09:25 – 09:50

S12.2 Strong selection and high plasticity facilitated bat evolution across an ecological boundary

Karen Sears, UCLA, Los Angeles, USA

09:50 – 10:15

S12.3 Molecular mechanisms underlying stable and uniform positioning of boundaries

Aman Husbans, The Ohio State University, Columbus, USA

10:15 – 10:40

S12.4 Is gynoeceum and fruit patterning a tale of shifting boundaries?

Cristina Ferrandiz, IBMCP. CSIC-UPV, Valencia, Spain

Bailey Allen Hall

11:10 – 12:25 Contributed Session C9

Progress and open questions in Spiralian Evo-Devo

Chairs: Jose M.Martin-Duran, Christina Grande

11:10 – 11:25

C9.1 Transcriptome profiling of annelid spiral cleavage at single-blastomere resolution

Bruno Vellutini, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany

11:25 – 11:40

C9.2 Chaetognath genomics challenges phylogenetic relationship and character evolution within spiralian

Ferdinand Marlétaz, Okinawa Institute of Science & Technology, Onna, Japan

11:40 – 11:55

C9.3 Lineage-specific genes and spiralian ciliary bands

David Lambert, University of Rochester, Rochester, USA

11:55 – 12:10

C9.4 Finding the genetic basis of developmental evolution using a polychaete model

Christina Zakas, New York University, New York, USA

12:10 – 12:25

C9.5 The genomic organization and expression of Hox genes in the miniaturized annelid *Dinophilus gyrociliatus*.

Viviana Cetrangolo, Sars International Centre for Marine Molecular Biology, University of Bergen, Bergen, Norway

Human Biology Room 1

11:10 – 12:25 Contributed Session C10

Going beyond embryos – Evolution of postembryonic development

Chairs: Nico Posnien, Micael Reis

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11:10 – 11:25

C10.1 How the beetle head got its horns: integrating a novel trait into a conserved trait complex

David Linz, Indiana University, Bloomington, USA

11:25 – 11:40

C10.2 Evolution of post-embryonic developmental patterns in Syllidae (Annelida): The case of *Ramisyllis multicaudata*, “the animal that looks like a tree”

Guillermo Ponz, Universidad Autónoma de Madrid, Madrid, Spain

11:40 – 11:55

C10.3 Unique variation in the active retinal margin in squamates

Julia Eymann, University of Helsinki, Helsinki, Finland

11:55 – 12:10

C10.4 Understanding the origin of the male-specific turbanate eyes of the mayfly *Cloeon dipterum*

Isabel Almudi, GEM-DMC2 María de Maeztu Unit of Excellence, CABD (Andalusian Centre for Developmental Biology), CSIC-Univ. Pablo de Olavide, Seville, Spain

12:10 – 12:25

C10.5 The cellular and genetic mechanisms of central complex diversification

Gregor Bucher, Georg-August-University Göttingen, Göttingen, Germany

Human Biology Room 2

11:10 – 12:25 Contributed Session C11

Eco-Evo-Devo 2

Chairs: Kevin Parsons, Craig Albertson

11:10 – 11:25

C11.1 It's the environment, stupid: turtle scute anomalies in ovo and in silico.

Roland Zimm, University of Helsinki, Helsinki, Finland

11:25 – 11:40

C11.2 The evolution of "fragmented" bones in blind Mexican cavefish

Joshua Gross, University of Cincinnati, Dept of Biology, Cincinnati, USA

11:40 – 11:55

C11.3 Transcriptomic insights into the evolutionary divergence of developmental plasticity in spadefoot toads

Ivan Gomez-Mestre, Donana Biological Station, CSIC, Seville, Spain

11:55 – 12:10

C11.4 Insulin signaling manipulation phenocopies evolution of host-associated polyphenism in the soapberry bug *Jadera haematoloma*

David Angelini, Colby College, Waterville, USA

12:10 – 12:25

C11.5 Gene-trait associations are environmentally dependent: genetic architecture of thermal tolerance shifts across acclimation environment in *Fundulus heteroclitus*

David Dayan, Clark University, Worcester, USA

The View

11:10 – 12:25 Contributed Session C12

The role of boundaries in organismal diversification

Chairs: Madelaine Bartlett, Chelsea D. Specht

11:10 – 11:25

C12.1 Boundaries and the evolution of floral form: Zingiberales as a test case

Chelsea Specht, Cornell University, Ithaca, NY, USA

11:25 – 11:40

C12.2 Posterior stem cells and segmentation processes in the annelid *Platynereis*

Guillaume Balavoine, CNRS / Institut Jacques Monod, Paris, France

11:40 – 11:55

C12.3 Vein or trachea first? A comparative and genetic study to test the pleural gill origin hypothesis of the insect wing.

Ana Alcaina-Caro, Centro Andaluz de Biología del Desarrollo, Seville, Spain

11:55 – 12:10

C12.4 Embryonal life histories: desiccation plasticity and diapause in the Argentinian pearlfish *Austrolebias bellottii*

Tom Van Dooren, Sorbonne University, Paris, France

12:10 – 12:25

- C12.5** Globins and hemogenic cells in the annelid worm *Platynereis dumerilii*
Solène Song, laboratoire Matière et Systèmes Complexes, Paris, France

Bailey Allen Hall

14:00 – 15:40 Symposium S13

Evolution of regeneration in the Metazoa

Organisers and Chairs: Eve Gazave, Eric Röttinger

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14:00 – 14:25

- S13.1** Molecular mechanisms of salamander regeneration
Karen Echeverri, University of Minnesota, Minneapolis, USA

14:25 – 14:50

- S13.2** Regeneration in sponges involves taxonomically restricted and conserved genes.
Maja Adamska, Australian National University, Canberra, Australia

14:50 – 15:15

- S13.3** Regeneration in planaria- why some can, while others can't.
Jochen Rink, MPI-CBG, Dresden, Germany

15:15 – 15:40

- S13.4** Regeneration in the presence and absence of stem cells in the cnidarian *Hydractinia*
Uri Frank, National University of Ireland, Galway, Galway, Ireland

Human Biology Room 1

14:00 – 15:40 Symposium S14

Rewiring motor systems to evolve a vertebrate head

Organiser and Chair: Bernd Fritzs

14:00 – 14:25

S14.1 Embryology of the hagfish and origin of the vertebrate head

Shigeru Kuratani, Laboratory for Evolutionary Morphology, RIKEN Center for Biosystems Dynamics Research, Kobe, Japan

14:25 – 14:50

S14.2 Of frogs, mice and men: Evolving an auditory system and its motor control of the sound amplification process.

Bernd Fritzs, University of Iowa, Iowa City, USA

14:50 – 15:15

S14.3 Evolution of visceral neurons in vertebrates

Jean-François Brunet, Ecole normale supérieure, Paris, France

15:15 – 15:40

S14.4 Eyes, ears and heads: evolution and development of a coordinated head-eye movement detection and guidance system.

Joel C. Glover, University of Oslo, Oslo, Norway

Human Biology Room 2

14:00 – 15:40 **Symposium S15**

Niche construction, behaviour, epigenetics and the extended evolutionary synthesis

Organiser and Chair: Rui Diogo

14:00 – 14:25

S15.1 Adaptive evolution of skull shape in bats

Sharlene Santana, University of Washington, Seattle, USA

14:25 – 14:50

S15.2 Developmental constraints, phylotypic stages and body plan evolution in vertebrates

Frietson Galis, Naturalis Biodiversity Center, Leiden, The Netherlands

14:50 – 15:15

S15.3 A brief introduction to the extended evolutionary synthesis

Tobias Uller, Lund University, Lund, Sweden

15:15 – 15:40

S15.4 Evolution driven by organismal behaviour - a unifying view of life, development, evolution, function, form, mismatches and trends

Rui Diogo, Howard University, Washington, USA

The View

14:00 – 15:40 **Symposium S16**

Floral evolution and development in non-model organisms

Organisers and Chairs: Catherine Damerval, Sophie Nadot

14:00 – 14:25

S16.1

Phylogenetic approach of floral evolution in Ranunculales

Laetitia Carrive, Université Paris-Sud, CNRS, AgroParisTech, Université Paris-Saclay, Orsay, France

14:25 – 14:50

S16.2

Variation on a theme: evolutionary-developmental insights into the Asteraceae flower head

Oriane Hidalgo, Royal Botanic Gardens, Kew, London, United Kingdom

14:50 – 15:15

S16.3

Evolution of carpel developmental regulators: combining phylogenetics and functional analysis

Annette Becker, Justus-Liebig-University, Institute of Plant Biology, Giessen, Germany

15:15 – 15:40

S16.4

Evolution of the LEAFY master floral regulator

Francois Parcy, CNRS, Univ. Grenoble Alpes, CEA, INRA, Grenoble, France

Bailey Allen Hall

16:10 – 17:10 Contributed Session C13

Evolution of regeneration in the Metazoa 1

Chairs: *Eve Gazave, Eric Röttinger*

Kindly Supported by:



16:10 – 16:25

C13.1 Neuronal control of limb regeneration in the crustacean *Parhyale hawaiiensis*

Chiara Sinigaglia, IGFL-CNRS, Lyon, France

16:25 – 16:40

C13.2 An evolutionary-conserved Wnt3/ β -catenin/Sp5 feedback loop restricts head organizer activity in *Hydra*

Matthias Vogg, University of Geneva, Geneva, Switzerland

16:40 – 16:55

C13.3 Genomic controls of skeleton development and regeneration in the brittle star *Amphiura filiformis*

Paola Oliveri, CLOE-UCL, London, United Kingdom

16:55 – 17:10

C13.4 Molecular mechanisms of spinal cord regeneration in *Xenopus*

Aniket Kshirsagar, Centre for Research in Medical Devices, Galway, Ireland

Human Biology Room 1

16:10 – 17:10 Contributed Session C14

Evolving a vertebrate head

Chair: Bernd Fritzsch

16:10 – 16:25

C14.1 Key events in the mammalian middle ear evolution: a research with Anatomical Network Analysis (AnNA)

Aitor Navarro-Díaz, University of Valencia, Paterna, Spain

16:25 – 11:40

C14.2 Our inner fish: old pharyngeal bauplans in the new vertebrate head

Robert Cerny, Charles University in Prague, Prague, Czech Republic

16:40 – 16:55

C14.3 Making of mammalian face by drastic shift of facial processes

Hiroki Higashiyama, The University of Tokyo, Tokyo, Japan

16:55 – 17:10

C14.4 Hagfish and lamprey Hox genes provide insights into the evolutionary origin of temporal colinearity

Juan Pascual-Anaya, Evolutionary Morphology Laboratory, RIKEN, Kobe, Japan

Human Biology Room 2

16:10 – 17:10 Contributed Session C15

Evolutionary dynamics to shape phenotype and direction in evolution

Chairs: Koichi Fujimoto, Paul François

16:10 – 16:25

C15.1 Developmental dynamics determine a genetic line of least resistance in mouse teeth

Luke Hayden, LBMC Ecole Normale Supérieure de Lyon, Lyon, France

16:25 – 16:40

C15.2 Step-by-step evolution of Bicoid's target specificity

Pinar Onal, New York University, New York, USA

16:40 – 16:55

C15.3 Maternal care influences adaptive craniofacial development in African cichlids

Tiffany Armstrong, University of Glasgow, Glasgow, United Kingdom

16:55 – 17:10

C15.4 Evolution-development congruence in pattern formation dynamics: Bifurcations in gene expression and regulation of networks structures

Takahiro Kohsokabe, The University of Tokyo, Tokyo, Japan

The View

16:10 – 17:10 Contributed Session C16

Floral evolution and development in non-modal organisms

Chairs: Catherine Damerval, Sophie Nadot

16:10 – 16:25

C16.1 Protein-protein interactions and the evolution of gene regulation in flower development

Madelaine Bartlett, University of Massachusetts, Amherst, USA

16:25 – 16:40

C16.2 Female flower of the enigmatic basal angiosperm *Ceratophyllum* re-interpreted

Dmitry Sokoloff, M.V. Lomonosov Moscow State University, Faculty of Biology, Moscow, Russian Federation

16:40 – 16:55

C16.3 Petal epidermal morphology and plant-pollinator interactions in the genus *Nicotiana*

Gabriela Doria, Department of Plant Sciences, University of Cambridge, Cambridge, United Kingdom

16:55 – 17:10

C16.4 Transcriptional Regulators of CYC2 Clade Genes in Defining Flower Type Identity in Asteraceae

Yafei Zhao, University of Helsinki, Helsinki, Finland

Bailey Allen Hall

17:20 – 18:00

K3

Keynote Lecture 3

Philipp Mitteroecker

**The dilemma of human childbirth: evolution, development, and
public health**

Bailey Allen Hall & The Cube

18:00 – 19:45

Poster Session 2

Odd Numbers

19:45

Conference Barbeque

Coaches at the Quadrangle NUI departing at 19.45

Friday 29th June 2018

Bailey Allen Hall

09:00 – 10:40

Symposium S17

Mechanisms of gene regulatory network evolution

Organisers and Chairs: Maria Ina Arnone, Paola Oliveri

Kindly Supported By:



09:00 – 09.25

- S17.1** Evolution of a conserved gene regulatory network during *Aedes aegypti* nervous system development
Marc S. Halfon, University at Buffalo-State University of New York, Buffalo, NY, USA

09:25 – 09:50

- S17.2** Evolution of the genetic networks that underlie arthropod segmentation.
Michael Akam, University of Cambridge, Cambridge, United Kingdom

09:50 – 10:15

- S17.3** A conserved gene regulatory network patterns the head skeleton of both jawed and jawless vertebrates
Daniel Medeiros, University of Colorado, Boulder, USA

10:15 – 10:40

- S17.4** Evolution and development of the earliest land plant rooting systems
Liam Dolan, University of Oxford, Oxford, United Kingdom

Human Biology Room 1

09:00 – 10:40 Symposium S18

Evo-Devo of appendages

Organiser and Chair: Joost Woltering

09:00 – 09.25

- S18.1** Deep evolutionary origin of fin and limb regeneration
Igor Schneider, Instituto de Ciências Biológicas, Universidade Federal do Pará, Belém, Brazil

09:25 – 09:50

S18.2 From fin-to-fin; fin evolution and diversification in teleost fish

Joost Woltering, University of Konstanz, Konstanz, Germany

09:50 – 10:15

S18.3 Morphological novelty in the vertebrate limb created by the water-to-land transition

Mikiko Tanaka, Tokyo Institute of Technology, Yokohama, Japan

10:15 – 10:40

S18.4 Development and evolution of the amniote penis and its relationship to cloacal differentiation.

Brooke A. Armfield, University of Florida, Gainesville, USA

Human Biology Room 2

09:00 – 10:40 Symposium S19

Evolutionary dynamics to shape phenotype and direction in evolution

Organisers and Chairs: Koichi Fujimoto, Paul François

Kindly Supported By:



09:00 – 09:25

S19.1 High-throughput laboratory evolution of *E. coli*: toward understanding of phenotypic plasticity and constraint

Chikara Furusawa, Quantitative Biology Center, RIKEN, Suita, Osaka, Japan

09:25 – 09:50

S19.2 Constrained variation of floral organ arrangement in basal eudicots: a correlation with species diversity of the organ number.

Koichi Fujimoto, Osaka University, Toyonaka, Japan

09:50 – 10:15

S19.3

In silico evolution and geometrical models of development

Paul François, McGill University, Montreal, Canada

10:15 – 10:40

S19.4

Cell-state organization by exploratory dynamics

Erez Braun, Technion, Haifa, Israel

The View

09:00 – 10:40 Contributed Session C17

Developmental constraints in the evolution of plants and animals

Chairs: Dmitry Sokoloff, Yulia Krauss

09:00 – 09.25

C17.1

Non-linear developmental landscapes shape developmental responses to morphological variation

James Cheverud, Loyola University, Chicago, USA

09:25 – 09:50

C17.2

Flower-like units from flower-like meristems – developmental constraints and options

Regine Claßen-Bockhoff, Institute of Organismic and Molecular Evolution (iomE), Johannes Gutenberg-University, Mainz, Germany

09:50 – 10:15

C17.3

The evolution and development of nectar spurs

Erin Cullen, University of Cambridge, Cambridge, United Kingdom

10:15 – 10:40

C17.4 Skull sutures as developmental constraints for morphological evolution

Diego Rasskin-Gutman, University of Valencia, Paterna, Spain

Bailey Allen Hall

11:10 – 12:25 Contributed Session C18

Mechanisms of gene regulatory network evolution 2

Chairs: Maria Ina Arnone, Paola Oliveri

Kindly Supported By:



11:10 – 11:25

C18.1 Identification of the evolutionary conserved regulatory element controlling the jaw joint formation in zebrafish

Tatjana Haitina, Uppsala University, Uppsala, Sweden

11:25 – 11:40

C18.2 A multi-omics approach contributes to a deeper understanding of the mid-posterior gut specification in two echinoderm species

Claudia Cuomo, Stazione Zoologica Anton Dohrn, Naples, Italy

11:40 – 11:55

C18.3 Segmentation in arthropods: a study investigating regulatory relationship between gap genes and pair-rule genes in the beetle *Tribolium castaneum*

Rahul Sharma, L C Miall Building, School of Biology, Faculty of Biological Sciences, University of Leeds, LS29JT, Leeds, United Kingdom

11:55 – 12:10

C18.4 Evolution of Brachyury function: comparing target genes in the cnidarian *Nematostella* and bilaterians

Ulrich Technau, University of Vienna, Vienna, Austria

12:10 – 12:25

C18.5 Specification of mesodermal lineages was altered in the evolution of the lecithotrophic sea urchin *Heliocidaris erythrogramma*

Allison Edgar, Duke University, Durham, USA

Human Biology Room 1

11:10 – 12:25 Contributed Session C19

Evolution of regeneration in the Metazoa 2

Chairs: Eve Gazave, Eric Röttinger

Kindly Supported by:



11:10 – 11:25

C19.1 An Egr homolog controls a putatively conserved wound response program in acoel regeneration

Mansi Srivastava, Harvard University, Cambridge, MA, USA

11:25 – 11:40

C19.2 Regeneration is a partial redeployment of the embryonic gene regulatory network

Hereroa Johnston, Université Côte d'Azur/CNRS/INSERM, Nice, France

11:40 – 11:55

C19.3

Posterior regeneration in the annelid *Platynereis*

Eve Gazave, CNRS - Institut Jacques Monod, Paris, France

11:55 – 12:10

C19.4

A novel mechanism underlying tooth replacement in bearded dragon lizards

Lotta Salomies, University of Helsinki, University of Helsinki, Finland

12:10 – 12:25

C19.5

A morphological and histological investigation of imperfect fin regeneration

Vivien Bothe, Museum für Naturkunde Berlin, Leibniz Institute for Research on Evolution and Biodiversity, Berlin, Germany

Human Biology Room 2

11:10 – 12:25 Contributed Session C20

Evo-Devo of appendages

Chair: Joost Woltering

Kindly Supported By:



11:10 – 11:25

C20.1

An ancient Turing reaction-diffusion mechanism regulates skin denticle patterning in sharks

Rory L. Cooper, Animal and Plant Sciences, The University of Sheffield, Sheffield, United Kingdom

11:25 – 11:40

C20.2 Evolution of vertebrate digit pattern formation at single cell resolution and in silico

Patrick Tschopp, University of Basel, Basel, Switzerland

11:40 – 11:55

C20.3 Limb loss in snakes is associated with widespread divergence of the cis-regulatory landscape

Michael Hiller, Max Planck Institute, Dresden, Germany

11:55 – 12:10

C20.4 Does developmental system drift facilitate appendage evolution? The case of rodent molars

Sophie Pantalacci, LBMC Ecole Normale Supérieure de Lyon, Lyon, France

12:10 – 12:25

C20.5 A missing piece on the Hox puzzle: HoxB/C and the development of the zebrafish caudal fin

Nicolás Cumplido, FONDAP Center for Genome Regulation. Facultad de Ciencias, Universidad de Chile., Santiago, Chile

The View

11:10 – 12:25 Contributed Session C21

Niche construction, behaviour, epigenetics and the Extended Evolutionary Synthesis

Chair: Rui Diogo

11:10 – 11:25

C21.1 An evo-devo view of the earliest foundations of language

D. Kimbrough Oller, University of Memphis, Memphis, USA

11:25 – 11:40

C21.2 Developmental constraints in the evolution of mammalian organs
Margarida Cardoso Moreira, Heidelberg University, Heidelberg, Germany

11:40 – 11:55

C21.3 Behind flexible stems: Exploring the evolution and molecular basis of craniofacial plasticity in teleosts
Dina Navon University of Massachusetts Amherst, Amherst, USA

11:55 – 12:10

C21.4 Eye adaptations: The evolution of the ocular skeleton through a developmental lens
Tamara Franz-Odendaal, Mount Saint Vincent University, Bedford, , Canada

12:10 – 12:25

C21.5 Revisiting Waddington with an epigenetic basis for the *Bithorax* phenocopy
Orli Snir-Dagan, Weizmann Institute of Science, Rehovot, Israel

Bailey Allen Hall

14:00 – 15:40 Symposium S20

Understanding morphological diversity at different evolutionary scales

Organisers and Chairs: Miltos Tsiantis, Angela Hay

Kindly Supported by:



14:00 – 14:25

S20.1 Exploring the genetic basis of floral novelty in *Aquilegia*.
Elena Kramer, Harvard University, Cambridge, USA

14:25 – 14:50

S20.2 Regulatory mechanisms underlying adaptive divergence of sticklebacks
Felicity Jones, Friedrich Miescher Laboratory of the Max Planck Society, Tübingen, Germany

14:50 – 15:15

S20.3 Changes in a Hox gene and its downstream regulatory network drive microevolution
Mark Rebeiz, University of Pittsburgh, Pittsburgh, USA

15:15 – 15:40

S20.4 The genetic basis for diversification of leaf form: from understanding to reconstructing
Miltos Tsiantis, Max Planck Institute for Plant Breeding Research, Koeln, Germany

Human Biology Room 1

14:00 – 15:40 Symposium S21

Systems biology of pattern formation

Chairs: Ezzat El-Sherif, Erik Clark

Kindly Supported by:



16:10 – 16:25

S21.1 Patterning with waves: A robust and evolvable mechanism for embryonic patterning
Ezzat El-Sherif, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany

16:25 – 16:40

S21.2 Systems biology of BMP-mediated dorsal/ventral patterning
Patrick Müller, Friedrich Miescher Laboratory of the Max Planck Society, Tübingen, Germany

16:40 – 16:55

S21.3 The role of Hairy in arthropod segmentation
Erik Clark, University of Cambridge, Cambridge, United Kingdom
See Alexia Sadlier C23.3

16:55 – 17:10

S21.4 The gene regulatory logic of vertebrate neural tube development
James Briscoe, The Francis Crick Institute, London, United Kingdom

Human Biology Room 2

14:00 – 15:40 Symposium S22

MorphoEvoDevo: Multilevel understanding of the evolution of animal structures and organ systems

Organiser and Chair: Sabrina Kaul-Strehlow

14:00 – 14:25

S22.1 Homology versus parsimony: The necessity of overcoming phylogenetic constraints in evolutionary thinking

Andreas Wanninger, University of Vienna, Vienna, Austria

14:25 – 14:50

S22.2 Function of BMP signaling in the annelid *Capitella teleta* and implication for nervous system evolution

Neva Meyer, Clark University, Worcester, USA

14:50 – 15:15

S22.3 Evolution of sensory organs – diversity of developmental processes, form and function

Angelika Stollewerk, Queen Mary University of London, London, United Kingdom

15:15 – 15:40

S22.4 Unraveling the evolution of glial cells

Conrad Helm, Georg-August-University Goettingen, Animal Evolution and Biodiversity, Goettingen, Germany

The View

14:00 – 15:40 Symposium S23

What does genotype-phenotype association tell us about development?

Organiser and Chair: Philipp Mitteröcker

14:00 – 14:25

S23.1

How well can we predict constraint from the developmental structure?

Mihaela Pavlicev, University of Cincinnati, Cincinnati, USA

14:25 – 14:50

S23.2

Dysmorphic phenotypes as biomarkers of key genetic signaling pathways in development

Neus Martínez-Abadías, European Molecular Biology Lab, Barcelona, Spain

14:50 – 15:15

S23.3

Genotype-phenotype maps and the developmental biology of variation

Benedikt Hallgrímsson, University of Calgary, Calgary, Canada

15:15 – 15:40

S23.4

What do genetic background effects and cryptic genetic variation tell us about the genotype-phenotype map?

Ian Dworkin, McMaster University, Hamilton, Canada

Bailey Allen Hall

16:10 – 17:10 **Contributed Session C22**

Understanding morphological diversity at different evolutionary scales

Chair: Miltos Tsiantis, Angela Hay

Kindly Supported by:



16:10 – 16:25

C22.1 The loci of evolution - Making sense of the genes and mutations that drive phenotypic evolution and domestication

Arnaud Martin, The George Washington University - Department of Biological Sciences, Washington, USA

16:25 – 16:40

C22.2 A linked chain of autonomously contracting cells forms an actomyosin cable during serosa window closure in the beetle *Tribolium castaneum*

Akanksha Jain, Max Planck institute of Molecular Cell Biology and genetics, Dresden, Germany

16:40 – 16:55

C22.3 Robustness of gene regulatory networks underlies evolutionary diversification of tetrapod limb development

Aimée Zuniga Department Biomedicine, University of Basel-Medical School, Basel, Switzerland

16:55 – 17:10

C22.4 Redundancy, robustness and pleiotropy at an evolved cis-regulatory region

Ella Preger-Ben Noon, HHMI Janelia Research Campus, Ashburn, USA

Human Biology Room 1

16:10 – 17:10 Contributed Session C23

Systems biology of pattern formation

Organisers and Chairs: Ezzat El-Sherif, Erik Clark

Kindly Supported by:



14:00 – 14:25

C23.1

A damped oscillator drives posterior gap gene expression in *Drosophila melanogaster*

Berta Verd, University of Cambridge, Cambridge, United Kingdom

14:25 – 14:50

C23.2

Evolvability and robustness: Insights from pattern formation models

Christine Mayer, University of Oslo, Oslo, Norway

14:50 – 15:15

C23.3

Finding new rules for the patterning of post-canine teeth in mammals: insights from Noctilionoid bats

Alexa Sadier, UCLA, Los Angeles, USA

15:15 – 15:40

C23.4

Cell-fate patterning in multicellular development of *Myxococcus xanthus* fruiting bodies: insights from a spatial dynamic model

Juan A Arias Del Angel, Instituto de Ecología, Universidad Nacional Autónoma de México, Mexico City, Mexico

Human Biology Room 2

16:10 – 17:10 Contributed Session C24

MorphoEvoDevo: Multilevel understanding of the evolution of animal structures and organ systems

Chair: Sabrina Kaul-Strehlow

16:10 – 16:25

C24.1 Using morphological approaches to characterise the nervous system of *Xenoturbella bocki*

Anne-C. Zakrzewski, University College London - Department of Genetics, Evolution and Environment, London, United Kingdom

16:25 – 16:40

C24.2 Gut-like ectodermal tissue in a sea anemone challenges germ layer homology

Patrick Steinmetz, Sars Centre / University of Bergen, Bergen, Norway

16:40 – 16:55

C24.3 A revised understanding of *Tribolium* morphogenesis further reconciles short and long germ development

Matthew Benton, University of Cambridge, Cambridge, United Kingdom

16:55 – 17:10

C24.4 Identification of neurodevelopmental processes underlying molluscan nervous system diversity

Elisabeth Zieger, Department of Integrative Zoology, University of Vienna, Vienna, Austria

The View

16:10 – 17:10 Contributed Session C25

What does genotype-phenotype association tell us about development?

Chair: Philipp Mitteröcker

16:10 – 16:25

C25.1 Evolution of eye size and head morphology between *Drosophila americana* and *D. novamexicana*

Micael Reis, Department of Developmental Biology, Georg-August-University Göttingen, Göttingen, Germany

16:25 – 16:40

C25.2 Mapping genetic determinants of natural variation and developmental stability of craniofacial shape in mice

Nicolas Navarro, EPHE, PSL Research University, Dijon, France

16:40 – 16:55

C25.3 Using morphometric methods to uncover the genetic basis of left-right asymmetry and island gigantism in the Faroese house mouse

Alik Huseynov, Friedrich Miescher Laboratory of the Max Planck Society, Tuebingen, Germany

16:55 – 17:10

C25.4 Expressional rescue of wing morphology defects in *Drosophila melanogaster*

Dagný Á. Rúnarsdóttir, University of Iceland, Reykjavík, Iceland

Bailey Allen Hall

17:20 – 17:35 Student Poster Prizes

Bailey Allen Hall

17:35 – 18:15

K4

Keynote Lecture

Graham Budd

The Cambrian explosion: putting the pieces back together

18:15 – 18:20

Conference Close

The View

18:20 – 19:00

Business Meeting