Society for Developmental Biology 79th Annual Meeting ONLINE

July 9 - 15, 2020

Program Committee: Alejandro Sánchez Alvarado (Chair, SDB President, Stowers Institute for Medical Research), Celina Juliano (University of California, Davis), Otger Campàs (University of California, Santa Barbara), Manu Prakash (Stanford University)

Local Organizing Committee: Carole LaBonne (Chair, Northwestern University), Naiche Adler (University of Illinois at Chicago), Jorge A. Cantú (Northeastern Illinois University)

ALL TIMES ARE US/CANADA EASTERN DAYLIGHT TIMES (UTC/GMT-5)

WEDNESDAY JULY 8 (Pre-Meeting Events)

Society for Developmental Biology 8th Boot Camp for New Faculty
10 am – 7 pm  Drill Sergeants: Kara Cerveny (Reed College) and Guillermo Oliver (Northwestern University) Limited to attendees selected from pool of applicants.

Satellite Symposium - Emerging Leaders in Live Cell Imaging Approaches of Developmental Biology
Co-organizers: David Q. Matus and Rebecca Adikes (Stony Brook University)

Session I: Innovations in live cell imaging of developmental biology - Part I
12:55 pm  Symposium introduction by David Q. Matus and Rebecca Adikes (Stony Brook University)
1:00 pm  Vanessa Barone (Scripps Institute of Oceanography/University of California, San Diego) A real time look at cell differentiation within echinoderm embryos
1:20 pm  Erica Hutchins (California Institute of Technology) Imaging RNA decay during the neural crest epithelial—mesenchymal transition
1:40 pm  Bin Gu (SickKids Research Institute/University of Toronto, Canada) Light up the embryos: Efficient generation of knock-in reporter mice by 2C-HR-CRISPR
2:00 pm  Hidehiko Hashimoto (University of Chicago) Dynamic integration of cell-cell signaling, force generation and tissue remodeling control zippering and neural tube closure
2:20 pm  Virtual Coffee Break

Session II: Innovations in light sheet microscopy design
2:40 pm  Alfred Millett-Sikking (Calico) A bolt-on single-objective light-sheet design with uncompromised numerical aperture
3:00 pm  Citlali Perez-Campos (Columbia University) SCAPE microscopy for high-speed imaging of in-vivo dynamics
3:20 pm  Tian-Ming Fu (Janelia Research Campus/HHMI) Imaging Biology in Native State: From Single-Molecule Dynamics to Whole-Organism Development
3:40 pm  Virtual Coffee Break
Session III: Innovations in live cell imaging of development - Part II

4:00 pm Akanksha Jain (ETH Zürich, Switzerland) 4D quantitative lightsheet imaging and analysis to study developing embryos and organoids

4:20 pm Elizabeth Haynes (University of Wisconsin, Madison) Branching out: kinesin light chains in the development of neuronal morphology and function

4:40 pm Rebecca Green (Ludwig Institute for Cancer Research, University of California, San Diego) 4D High Content Imaging and Automated Phenotypic Profiling of C. elegans Embryogenesis

Session IV: Innovations in image analysis

4:00 pm Meghan Driscoll (University of Texas Southwestern Medical Center) Regulation of Intracellular Signaling via Cellular Morphology

4:20 pm Break

4:30 pm Breakout Sessions

THURSDAY JULY 9

Presidential Symposium – Development at Multiple Scales  Sponsored by WIREs-Developmental Biology

11:15 am Opening by SDB President Alejandro Sánchez Alvarado (Stowers Institute for Medical Research)

11:30 am Nicole King (University of California, Berkeley) Choanoflagellates and the origin of animal morphogenesis

11:55 am Lakshminaraya Mahadevan (Harvard University) Dynamic morphoskeletons and morphogenesis

12:20 pm Jean-Phillipe Vielle Calzada (CINVESTAV, Mexico) Apomixis: epigenetic control of clonal seed formation in flowering plants

12:45 pm Valentina Greco (Yale University) Skin-resident immune cells actively coordinate their distribution with epithelial stem cells during homeostasis

1:10 pm Manu Prakash (Stanford University) Life in flatland: Emergent mechanics and origins of behavior in simple non-neuronal systems

1:35 pm Break

Special Interest Symposium – Confronting Bias in Scientific Culture

Co-chairs: Nicole Theodosiou (Union College) and Graciela Unguez (New Mexico State University)

2:00 pm Introduction by Nicole Theodosiou and Graciela Unguez

2:05 pm Mary Alice Scott (New Mexico State University) Breaking the Culture Bias in Science

2:30 pm Scott Gilbert (Swarthmore College) A Carrier Bag Theory of Non-Fiction: Removing COWDUNG and Prick Tales from our Biological Narratives

2:55 pm Discussion

3:30 pm Break

Concurrent 1 – Pattern Formation Across Scales
4:00 pm  Jessica Feldman (Stanford University) Patterning the microtubule cytoskeleton during development

4:20 pm  Irina Matos (The Rockefeller University) How to build a necessary wall: progenitors apically polarize WNT inhibitors to orchestrate tissue development

4:40 pm  Tony Tsai (Harvard Medical School) An adhesion code ensures robust pattern formation during tissue morphogenesis

5:00 pm  Martyna Lukoseviciute (University of Oxford, UK) Making heads or tails of an embryo: differential foxd3 regulation in the cranial neural crest and tailbud neuromesodermal progenitors

5:20 pm  Peter Whitney (New York University) Reading a gradient twice: the cis regulatory logic of a multi-enhancer system

5:40 pm  Rashmi Priya (Max Planck Institute for Heart and Lung Research, Germany) Tension heterogeneity instructs morphogenesis and fate specification during heart development

6:00 pm  Break

Concurrent 2 – On the Razor’s Edge: Cutting-Edge Tools for Developmental Biology

4:00 pm  Jared Toettcher (Princeton University) Optogenetics for perturbing and replacing developmental signaling patterns

4:20 pm  Ariel Bazzini (Stowers Institute for Medical Research) CRISPR-Cas13d Induces Efficient mRNA Knock-down in Embryos

4:40 pm  Christopher Lowe (Stanford University) Hemichordate anteroposterior patterning in contrasting life history strategies

5:00 pm  Joaquin Letelier (Universidad Mayor, Chile; CSIC/UPO/JA, Spain) Medaka gli3 mutants reveal deep conservation of fin/limb developmental programs

5:20 pm  Stephanie Höhn (University of Cambridge, UK) Morphogenesis is stressful – Elastic properties of folding cell sheets

5:40 pm  TBD

6:00 pm  Break

Concurrent 3 – Unresolved Developmental Mechanisms

4:00 pm  Wenchao Qian (University of Pennsylvania) A Spatial Gradient of Cell Size Regulates Genome Activation and Vertebrate Early Development

4:20 pm  Heather Bruce (Marine Biological Lab) Insect wings and body wall evolved from ancient leg segments

4:40 pm  Tim Fulton (University of Cambridge, UK) Axis specification in zebrafish is robust to cell mixing and reveals feedback from morphogenesis to pattern formation

5:00 pm  Jessica Stock (Research Institute of Molecular Pathology (IMP), Austria) A self-generated Toddler gradient directs mesodermal cell migration during zebrafish gastrulation

5:20 pm  Shuangshuang Du (Yale University) Cellular and structural orchestrations that sustain skin regeneration captured by live imaging

5:40 pm  Itzel Sifuentes-Romero (Florida Atlantic University) Repeated evolution of eye loss in Astyanax mexicanus
### Concurrent 4 – Regeneration: Bridging the Gap

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 pm</td>
<td>Andrew Gillis (University of Cambridge, UK)</td>
<td>Adult chondrogenesis and spontaneous cartilage repair in the skate, Leucoraja erinacea</td>
</tr>
<tr>
<td>4:20 pm</td>
<td>Blair Benham-Pyle (Stowers Institute for Medical Research)</td>
<td>Rare and transient somatic cell states are induced by injury and required for whole-body regeneration</td>
</tr>
<tr>
<td>4:40 pm</td>
<td>Olena Zhulyn (Stanford University)</td>
<td>Rapid remodeling of the translatome underlies wound closure and regeneration</td>
</tr>
<tr>
<td>5:00 pm</td>
<td>Jack Cazet (University of California, Davis)</td>
<td>Injuries induce an oral-specifying Wnt signaling cascade in Hydra</td>
</tr>
<tr>
<td>5:20 pm</td>
<td>Andrew Gehrke (Harvard University)</td>
<td>The 3D regulatory landscape of whole-body regeneration</td>
</tr>
<tr>
<td>5:40 pm</td>
<td>Francesca Mariani (University of Southern California)</td>
<td>Shh is expressed early after skelatal injury and is required for large-scale bone regeneration</td>
</tr>
<tr>
<td>6:00 pm</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

### FRIDAY JULY 10

10-11 am **Theme Tables**

### Plenary I – Visualizing the Agents of Developmental Processes

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 am</td>
<td>Neha Kamat (Northwestern University)</td>
<td></td>
</tr>
<tr>
<td>11:55 am</td>
<td>Andrew York (Calico)</td>
<td></td>
</tr>
<tr>
<td>12:20 pm</td>
<td>Stefano Di Talia (Duke University Medical Center)</td>
<td>Waves and flows: physical principles of organization of embryogenesis and regeneration</td>
</tr>
<tr>
<td>12:55 pm</td>
<td>Guillermima Ramirez-San Juan (Stanford University)</td>
<td>Multiscale spatial heterogeneity enhances particle clearance in airway ciliary arrays</td>
</tr>
<tr>
<td>1:10 pm</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

### Hilde Mangold Postdoctoral Symposium

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 pm</td>
<td>Katie Cockburn (Yale University)</td>
<td>Co-occurring differentiation and proliferation behaviors define epidermal regeneration</td>
</tr>
<tr>
<td>1:45 pm</td>
<td>Wouter Masselink (Research Institute of Molecular Pathology (IMP), Austria)</td>
<td>A unique population of Asomitic Mesodermal cells controls axolotl tail regeneration</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Granont Jindal (University of California, San Diego)</td>
<td>A single base pair change dramatically alters binding site affinity and enhancer activity</td>
</tr>
<tr>
<td>2:15 pm</td>
<td>Justin Varholick (University of Florida)</td>
<td>A first look into whether psychological stress delays regeneration in spiny mice (Acomys cahirinus)</td>
</tr>
<tr>
<td>2:30 pm</td>
<td>Zak Swartz (Whitehead Institute for Biomedical Research)</td>
<td>Polarized dissolution and condensation of Dishevelled in oocytes drives embryonic axis specification</td>
</tr>
<tr>
<td>2:45 pm</td>
<td>Lauren Walker (University of Pennsylvania)</td>
<td>Identification of extrinsic cues promoting target-</td>
</tr>
</tbody>
</table>
selective axon regeneration

3:00 pm  Karolina Mizeracka (Boston Children's Hospital)  Different paths to the same cell type
3:15 pm  Mary Regier (University of Washington)  Single-Cell Spatial Transcriptomics at Embryo-Scale
3:30 pm  Break

Concurrent 5  -  Cells on the Move  
4:00 pm  Lillian Fritz-Laylin (University of Massachusetts Amherst)  Chytrid fungi and our evolving view of cell motility
4:20 pm  Minna Roh-Johnson (University of Utah)  Cell-matrix interactions during cell migration in vivo
4:40 pm  Thomas Schilling (University of California, Irvine)  Regulation of cell adhesion dynamics coordinates migration and fate decisions in the neural crest
5:00 pm  Bomsoo Cho (Stanford School of Medicine)  Prickle isoforms determine handedness of helical morphogenesis
5:20 pm  Subramanian Ramanathan (Stowers Institute for Medical Research)  Cell-size differential drives aberrant clone dispersal in epithelial tissue
5:40 pm  Shinuo Weng (University of Texas at Austin)  Cell crawling and junction contraction: “Frenemies” in convergent extension
6:00 pm  Break

Concurrent 6  -  Organoids: A Window to Developmental Processes  
4:00 pm  Adriana Harbuzariu (Morehouse School of Medicine)  Development of an ex vivo human brain organoid model to study severe malaria-associated brain injury
4:20 pm  Sarah Saxton (University of Washington)  Hepatoblast organoids have bipotential fate in engineered liver tissue
4:40 pm  Mirna Marinic (University of Chicago)  Towards a complex in vitro model of human endometrium
5:00 pm  Yuji Atsuta (Kyushu University, Japan; Harvard)  Making vertebrate limbs from non-limb fibroblasts
5:20 pm  Sarah Hadyniak (Johns Hopkins University)  Temporal regulation of green and red cone photoreceptor specification in human retinas and retinal organoids
5:40 pm  Angie Serrano (University of Utah)  Cellular and molecular mechanisms of Kabuki Syndrome neurodevelopmental defects in zebrafish and human iPSC-derived brain organoids
6:00 pm  Break

Concurrent 7  –  Developmental Biology and Global Health
4:00 pm  Priya S. Shah (University of California, Davis)  Unraveling the similarities between hereditary and viral microcephaly
4:20 pm  Emmitt Jolly (Case Western University)  Heads or tails: A parasitic tale of two developmental outcomes
4:40 pm  Jayhun Lee (Morgridge Institute for Research)  The esophageal gland-mediated host immune evasion by blood fluke Schistosoma mansoni
5:00 pm  Jennifer Watts (Michigan State University)  The effects of sexually-transmitted ZIKV infection on
preimplantation development

5:20 pm  **Maria Mikedis** (Whitehead Institute) *A broad translational program regulates the progenitor population during spermatogenesis*

5:40 pm  **Anita Quintana** (University of Texas El Paso) *Molecular mechanisms modulating neural development in cblX syndrome*

6:00 pm  *Break*

**Concurrent 8 – Finding a Partner: Evolution, the Immune System and the Origins of Symbiosis**

4:00 pm  **Annika Guse** (Heidelberg University, Germany) *Dinoflagellate symbionts escape vomocytosis by host cell immune suppression*

4:20 pm  **Jodie Schiffer** (Northeastern University) *Caenorhabditis elegans processes sensory information to choose between freeloaders and self-defense strategies*

4:40 pm  **Minjie Hu** (Carnegie Institution for Science) *Lineage dynamics of the endosymbiotic cell type in a soft coral Xenia*

5:00 pm  **Raymond Allen** (Duke University) *The roles of Macrophage Migratory Inhibitory Factors (MIFs) in sea urchin development*

5:20 pm  **Rujuta Deshpande** (University of Calgary, Canada) *The role of intestinal TOR signaling in metabolic responses to bacterial infection*

5:40 pm  **Joseph Parker** (California Institute of Technology) *Cell type evolution and biosynthetic innovation in animals*

6:00 pm  *Break*

6:30-7:30 pm  **Theme Tables**

**SATURDAY JULY 11**

10-11 am  **Theme Tables**

**Plenary II - Genotype, Phenotype & Evolution**  
Sponsored by Developmental Biology

11:30 am  **Wallace Marshall** (University of California, San Francisco) *Pattern formation and regeneration in a single cell*

11:55 am  **Natalia Pabon Mora** (Universidad de Antioquia, Colombia) *Evolutionary shifts in the genetic regulatory network controlling fruit development across eudicots*

12:20 pm  **Ehab Abouheif** (McGill University, Canada) *Of Ants and Embryos: Pathways to Major Evolutionary Transitions*

12:55 pm  **Kimberly Cooper** (University of California, San Diego) *How (and why) the jerboa got its long legs*

1:10 pm  *Break*

**Workshop – Strategies to Decrease Biases in Science**

1:30-3:30 pm  Panel and Discussion
Concurrent 9 - Climate Change and Adaptation: Open Problem for Developmental Biologists

4:00 pm Leslie Ries (Georgetown University) A novel framework for understanding and projecting insect responses to climate change

4:20 pm Virginia Weis (Oregon State University) Coral symbiosis cell biology in the age of climate crisis: Turning discovery into solutions for saving reefs

4:40 pm Michael Dorrity (University of Washington) Temperature stress introduces variability in embryogenesis via cell type-specific effects on developmental rate

5:00 pm Alberto Stolfi (Georgia Institute of Technology) Development of sensory, secretory, and contractile functions of an organ for settlement and metamorphosis of tunicate larvae

5:20 pm Jacob Daane (Boston Children's Hospital, Harvard University, Northeastern University) From the depths: deep comparative phylogenomics in fishes to identify genetic mechanisms of evolution, development, and disease

5:20 pm Robert Reed (Cornell University) Cis-regulatory architecture of butterfly wing pattern evolution

6:00 pm Break

Concurrent 10 - Seeing is Believing: Imaging Revolution

4:00 pm Nicholas Plachta (National University of Singapore, Singapore) - EMBO Jr Investigator Imaging the dynamics that form the early mammalian embryo

4:20 pm Elizabeth Driver (National Institute on Deafness and Other Communication Disorders/NIH) Cochlear extension and patterning require Myosin II and E-cadherin

4:40 pm Marissa Gredler (Sloan Kettering Institute/HHMI) Dynamic cell behaviors drive axial mesoderm morphogenesis

5:00 pm Leslie Mateo (Stanford University) Super-resolution imaging of 3D DNA folding and RNA transcription during Drosophila development

5:20 pm Akankshi Munjal (Harvard Medical School) Hyaluronan-hydraulics and contractile-cytocinches drive inner ear morphogenesis

5:20 pm Elizabeth Urban (Johns Hopkins University) Determining how noisy transcription controls stochastic fate specification in the developing fly eye

6:00 pm Break

Concurrent 11 - The Biology of Aging

4:00 pm Guo Huang (University of California San Francisco) Molecular control of organ regeneration: Insights from platypus, armadillos, bats and whales

4:20 pm Maximina Yun (TU Dresden, Germany) Telomere length is exclusively maintained by the ALT mechanism in a regeneration-competent vertebrate, the newt Pleurodeles waltl

4:40 pm Peter Kropp (NIDDK/National Institutes of Health) Pleiotropic effects of mitochondrial dysfunction: A characterization of Multiple Mitochondrial Dysfunctions Syndrome 1

5:00 pm John Quinn (Arizona State University) Regulation of Damage-Responsive Maturity-Silenced enhancers in Drosophila

5:20 pm Emily Heckman (University of Oregon) Molecular mechanisms that enable synapse stabilization and restoration
5:20 pm  TBD
6:00 pm  Break

**Concurrent 12 - Endless Forms Most Beautiful: Role of Biodiversity in Developmental Biology**

4:00 pm  Ricardo Mallarino (Princeton University) *How to build a gliding mammal: patterning mechanisms in mammalian skin*

4:20 pm  Caroline Albertin (Marine Biological Laboratory) *HOX genes and the cephalopod body plan*

4:40 pm  Yaowu Yuan (University of Connecticut) Development and evolution of self-organizing pigmentation patterns in

5:00 pm  Wei Wang (Stowers Institute for Medical Research) *Regeneration enhancers and the uneven distribution of regenerative capacities in vertebrates*

5:20 pm  Elena Boer (University of Utah) – Best 2019 Developmental Biology trainee author. *From head to toe: uncovering mechanisms of craniofacial and limb variation in domestic pigeons*

5:20 pm  Ahmet Karabulut (Stowers Institute for Medical Research) *Architecture and explosive discharge of a cellular weapon*

6:00 pm  Break

6:30-7:30 pm  **Theme Tables**

---

**SUNDAY JULY 12**

11 am –  Brunch with SDB Board of Directors
12:30 pm  

**Awards Lectures**

1:00 pm  Introduction

1:05 pm  Brigid Hogan (Duke University) – FASEB Excellence in Science Award.  
*Reflections on a career in developmental biology: What I wish I had known when I was younger*

1:40 pm  Cagney Coomer (University of Kentucky) – SDB Trainee Science Communication Award.  
*Nerd squad. The movement.*

2:00 pm  Celina Juliano (University of California-Davis) – Elizabeth D. Hay New Investigator Award.  
*Mechanisms of Development and Regeneration in Hydra*

2:35 pm  Break

2:35 pm  Jo Handelsman (University of Wisconsin) - Viktor Hamburger Outstanding Educator Prize.  
*Tiny Earth: Studentsourcing Antibiotic Discovery*

3:35 pm  Ray Keller (University of Virginia) – Developmental Biology-SDB Lifetime Achievement Award  
*50 Years of Adventures with Friends in Morphogenesis*

4:10 pm  Claude Desplan (New York University) – Edwin G. Conklin Award  
*The generation of neural diversity*

4:45 pm  End of Platform Sessions
MONDAY JULY 13
Poster Live Q&A Presentations (See meeting app for detailed agenda.)
11:00 am  **Live Q&A Poster Sessions 1-4**
12:30 pm  **Break**
1:00 pm  **Live Q&A Poster Sessions 5-8**
2:30 pm  **Break**
3:00 pm  **Live Q&A Poster Sessions 9-12**
4:30 pm  **Break**

TUESDAY JULY 14
11:00 am  **Live Q&A Poster Sessions 13-16**
12:30 pm  **Break**
1:00 pm  **Live Q&A Poster Sessions 17-20**
2:30 pm  **Break**
3:00 pm  **Live Q&A Poster Sessions 21-24**
4:30 pm  **Break**

WEDNESDAY JULY 15
11:00 am  **Live Q&A Poster Sessions 25-28**
12:30 pm  **Break**
1:00 pm  **Undergraduate Best Poster Competition Finals**
1:30 pm  **Graduate Best Poster Competition Finals**
2:00 pm  **Break**
2:30 pm  **Best Poster Awards Presentation**

*All posters will be online and accessible for viewing from July 8 on.*