

Developmental Biology of the Sea Urchin and Other Marine Invertebrates XXVIII

April 2-5, 2025

Marine Biological Laboratory, Woods Hole, MA, USA

Wednesday, April 2

Pre-Meeting Workshops

14:30—15:30	Loeb G70	<i>Genetic Approaches in <i>L. pictus</i></i> Moderator: Amro Hamdoun, Scripps Institution of Oceanography
15:30—16:00	Loeb G70	Coffee Break
16:00—17:00	Loeb G70	<i>Methods in Image Analysis</i> Moderators: Brad Shuster (NMSU) and Vanessa Barone (Stanford)
17:00—19:00	Swope	<i>Dinner Break</i>

Plenary Session 1: Welcome and Keynote Lectures

Chair: Zak Swartz

19:00—19:10	Clapp/Lillie	<i>Introduction & Welcome from the MBL</i>
19:10—20:10	Clapp/Lillie	EMBO Young Investigator Lecture: Yaniv Elkouby , Hebrew University of Jerusalem. <i>Illuminating unpredicted cellular machineries in germ cell production, gonad development, and reproduction.</i>
20:10—21:10	Clapp/Lillie	Early Investigator Lecture: Cat Schrankel , San Diego State University. <i>A novel role for host defense peptides in transducing bacterial cues for marine invertebrate metamorphosis via TLR signaling.</i>
21:10—23:00	Swope	<i>Social Mixer</i>

Thursday, April 3

Plenary Session 2: Evolution and Mechanisms of Neurogenesis

Chair: Smadar Ben Tabou de Leon

08:30—08:55	Clapp/Lillie	Shunsuke Yaguchi , University of Tsukuba: <i>Developmental single-cell transcriptomics illuminates molecular pathways involved in sea urchin neurogenesis</i>
08:55—09:20	Clapp/Lillie	Ina Arnone , Stazione Zoologica Anton Dohrn: <i>Development and evolution of nervous system from a cell type perspective</i>
09:20—09:45	Clapp/Lillie	Amro Hamdoun , Scripps Institution of Oceanography: <i>Genetics, automation and the juvenile nervous system of <i>Lytechinus pictus</i></i>
09:45—10:00	Clapp/Lillie	The Company of Biologists (Zoom)
10:00—10:30	Lillie Lobby	<i>Coffee Break</i>

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Thursday, April 3 (continued)**Plenary Session 3: Developmental Signaling**

Chair: Yi-Hsien Su

10:30—10:55	Clapp/Lillie	Theirry Lepage , University of Nice: <i>What makes Panda an antagonist of Nodal signaling: Structural basis for a functional antagonist in the TGF-beta superfamily. (Zoom)</i>
10:55—11:20	Clapp/Lillie	Jennifer Fenner , Auburn University: <i>Wnt inhibitory factor-1 fine-tunes early Wnt-mediated endomesoderm and neuroectoderm patterning in sea urchin embryos.</i>
11:20—11:45	Clapp/Lillie	Athula Wikramanayake , University of Miami: <i>Functional analysis of the Nematostella Wnt/β-catenin destruction complex provides insight into the evolution of a critical regulatory module in a major metazoan signal transduction pathway.</i>
11:45—12:00	Clapp/Lillie	Ryan Range , Auburn University: <i>Extracellular control of the anterior-posterior Wnt signaling network in sea urchin embryos.</i>
12:00—13:30	Swope	Lunch Break

Plenary Session 4: Innovations in Education: Talks and Panel Discussion

Chairs: David Burgess and Zak Swartz

13:30—13:40	Clapp/Lillie	David Burgess , Boston College
13:40—13:50	Clapp/Lillie	Beverly Naigles , MBL
13:50—14:00	Clapp/Lillie	Brittania Moodie , Whitehead Institute
14:00—14:10	Clapp/Lillie	Julia Morales , Sorbonne Université
14:10—15:00	Clapp/Lillie	Panel Discussion
15:00—15:30	Lillie Lobby	Coffee Break

Concurrent Session 1A

Chair: Periklis Paganos

15:30—15:45	Clapp/Lillie	Macie Chess , Carnegie Mellon University: <i>Horizontal transfer of msp130 genes and the evolution of metazoan biocalcification</i>
15:45—16:00	Clapp/Lillie	Prashant Tewari , University of Haifa: <i>p21 Activated Kinases Expression, Regulation, and their Roles in Sea Urchin Development and Skeletogenesis</i>
16:00—16:15	Clapp/Lillie	Xiantong Xin , Carnegie Mellon University: <i>Skeletogenic potential in non-skeletal lineages: Single-cell insights into VEGF3-mediated transdifferentiation in sea urchins</i>
16:15—16:30	Clapp/Lillie	William Douglas , Carnegie Mellon University: <i>Differential gene expression within a multinucleated cell: dorsal-specific expression of genes in the skeletogenic syncytium of the sea urchin embryo</i>
16:30—16:45	Clapp/Lillie	Sydney Roman , Brown University: <i>Lysyl Oxidase is Essential for Germ Layer Formation</i>
17:00—19:00	Swope	Dinner Break

Thursday, April 3 (continued)

Concurrent Session 1B

Chair: Jennifer Fenner

15:30—15:45	Speck/Rowe	Lucas Guttieres , University of Florida: <i>The evolution of the Cadherin-Catenin-Complex in the ctenophore species Mnemiopsis leidyi</i>
15:45—16:00	Speck/Rowe	Lauren Lubeck , Stanford University: <i>Modulations depending on life history: Wnt signaling in posterior patterning of hemichordate embryos</i>
16:00—16:15	Speck/Rowe	Qianzi Zhou , Duke University: <i>Nodal is expressed and regulates axis formation much earlier during embryogenesis in Heliocidaris erythrogramma</i>
16:15—16:30	Speck/Rowe	Alejandro Berrio , Duke University: <i>Gene enrichment in the anterior half of Heliocidaris erythrogramma larvae: Why is it so neural?</i>
16:30—16:45	Speck/Rowe	Julienn Torres-Rodriguez , University of Puerto Rico: <i>Elucidating the role of Notch signaling in radial nerve cord and intestinal regeneration in the sea cucumber Holothuria glaberrima</i>
16:30—16:45	Speck/Rowe	Alexandra Lion , Boston University: <i>The P-body component LvDDX6 is necessary for normal morphogenesis in sea urchin embryos</i>
17:00—19:00	Swope	<i>Dinner Break</i>

Plenary Session 5: ISDB-C&D Lecture in Memory of Eric Davidson

Chair: Ina Arnone

19:00—20:00	Clapp/Lillie	Ellen Rothenberg , California Institute of Technology
20:00—23:00	Swope	Poster Session I and Social Mixer

Friday, April 4

Plenary Session 6: Morphogenesis and Metamorphosis

Chair: Jia Song

08:30—08:55	Clapp/Lillie	David McClay , Duke University: <i>Building a gut.</i>
08:55—09:20	Clapp/Lillie	Greg Wray , Duke University: <i>Turbo-devo: reaching metamorphosis ASAP</i>
09:20—09:45	Clapp/Lillie	Vanessa Barone , Stanford University: <i>Echinoderm embryos to model epithelial morphogenesis: from cell biology to evo-devo</i>
09:45—10:00	Clapp/Lillie	Andreas Heyland , University of Guelph: <i>Thyroid hormones reversibly inhibit metamorphic development in ophiuroid larvae</i>
10:00—10:30	Lillie Lobby	<i>Coffee Break</i>

Friday, April 4 (continued)**Plenary Session 7: Genome Evolution**

Chair: Veronica Hinman

10:30—10:55	Clapp/Lillie	Yi-Hsien Su , Academia Sinica: <i>Comparative genomics and the evolution of deuterostomes</i>
10:55—11:20	Clapp/Lillie	Yi-Jyun Luo , Academia Sinica: <i>Exploring animal evolution through chromosome-level comparative genomics.</i>
11:20—11:45	Clapp/Lillie	Billie Swalla, University of Washington : <i>Deuterostome Ancestors and Chordate Origins</i>
11:45—12:00	Clapp/Lillie	Veronica Hinman , Whitney Marine Laboratory: <i>Echinobase Town Hall</i>
12:00—13:30	Swope	<i>Lunch Break</i>

Plenary Session 8: Immunology

Chair: Elaine Seaver

13:30—13:55	Clapp/Lillie	Rossella Annunziata , Stazione Zoologica Anton Dohrn: <i>Fluorescent pigmented cells in sea cucumbers: from development to function and beyond</i>
13:55—14:20	Clapp/Lillie	Kate Buckley , Auburn University: <i>Refining functional capacities of immune cell populations in sea urchin larvae</i>
14:20—14:45	Clapp/Lillie	Sebastien Fugmann , Chang Gung University: <i>The evolutionary conservation of inflammation</i>
14:45—15:00	Clapp/Lillie	Jonathan Rast , Emory University: <i>Development of the sea lamprey adaptive immune system</i>
15:00—15:30	Lillie Lobby	<i>Coffee Break</i>

Concurrent Session 2A

Chair: Beverly Naigles

15:30—15:45	Clapp/Lillie	Nicholas Christodoulides , Carnegie Mellon University: <i>Enhancing Orthology with ECOP: A Pipeline for Echinoderm Comparative Genomics</i>
15:45—16:00	Clapp/Lillie	Akshay Kane , Marine Biological Laboratory: <i>VitelloTag: a tool for high throughput cargo delivery into oocytes and other ovarian cell types</i>
16:00—16:15	Clapp/Lillie	Carl Manner , Duke University: <i>Transfection and transduction in urchin embryos and urchin derived cell lines</i>
16:15—16:30	Clapp/Lillie	Cesar Arenas-Mena , City University of New York: <i>Transcriptional potency in sea urchin embryos</i>
16:30—16:45	Clapp/Lillie	Talia Marc , Marine Biological Laboratory: <i>Leptosynpata tenuis in the lab: a clear, tiny, and portable sea cucumber from Cape Cod.</i>
17:00—19:00	Swope	<i>Dinner Break</i>

Friday, April 4 (continued)**Concurrent Session 2B**

Chair: Rossella Annunziata

15:30—15:45	Speck/Rowe	Jenks Hehmeyer , University of Chicago: <i>A hemichordate single cell atlas reveals the extensive lineage-specific turnover and diversification in neuron type selector and effector programs</i>
15:45—16:00	Speck/Rowe	Lorenza Rusciano , Stazione Zoologica Anton Dohrn: <i>Exploring the pancreatic-like cell composition of a sea urchin at a single-cell resolution</i>
16:00—16:15	Speck/Rowe	Periklis Paganos , Marine Biological Laboratory: <i>Single cell transcriptomics reveals the pre-chordate origins of conserved ovarian cell types and regulatory systems</i>
16:15—16:30	Speck/Rowe	Michael Testa , University of Delaware: <i>A novel regulatory paradigm: microRNA induced translational-dependent mRNA decay</i>
16:30—16:45	Speck/Rowe	Malcolm Arnott , University of Delaware: <i>Investigating conserved mechanisms of RNA transport to the mitotic spindle</i>
17:00—19:00	Swope	<i>Dinner Break</i>

Plenary Session 9: Keynote Lecture

Chair: Zak Swartz

19:00—20:00	Clapp/Lillie	Ed Munro , University of Chicago: <i>How self-pulled zippers and self-driven shuttles shape epithelial tubes during ascidian development</i>
20:00—23:00	Swope	Poster Session II and Social Mixer

Saturday, April 5**Plenary Session 10: Reproduction and Early Development**

Chair: Jr-Kai Sky Yu

08:30—08:55	Clapp/Lillie	Karen Chan , University of Washington: <i>Fertilization kinetics after marine heatwave exposure</i>
08:55—09:20	Clapp/Lillie	Brad Shuster , New Mexico State University: <i>Defining the cleavage plane stimulus-response system at the nanoscale level in sea urchin embryos</i>
09:20—09:45	Clapp/Lillie	Jia Song , University of Delaware: <i>Post-transcriptional regulation during early development</i>
09:45—10:00	Clapp/Lillie	Titus Brown , UC Davis: <i>Technological upgrades to the MBL GERN course, and thoughts on the future of community-wide network models.</i>
10:00—10:30	Lillie Lobby	<i>Coffee Break</i>

Saturday, April 5 (Continued)

Plenary Session 11: Skeletogenesis

Chair: Paola Oliveri

10:30—10:55	Clapp/Lillie	Chuck Etensohn , Carnegie Mellon University: <i>Gene regulatory network dynamics: a developmental transition in the control of the sea urchin skeletogenic network</i>
10:55—11:20	Clapp/Lillie	Smadar Ben Tabou de Leon , University of Haifa: <i>From transcription to deposition – genetic and cellular regulation of sea urchin skeletal growth</i>
11:20—11:45	Clapp/Lillie	Cyndi Bradham , Boston University: <i>Alizarin Red Perturbs Skeletal Patterning and Biomineralization via Catalase Inhibition</i>
11:45—12:00	Clapp/Lillie	Gary Wessel , Brown University: <i>The Spikes of Spikey Skinned Animals.</i>
12:00—13:30	Swope	<i>Lunch Break</i>

Plenary Session 12: Regeneration

Chair: Kate Buckley

13:30—13:55	Clapp/Lillie	Veronica Hinman , Whitney Marine Laboratory: <i>Building to Regrow: The Sea Star Blastema and Larval Regeneration</i>
13:55—14:20	Clapp/Lillie	Vivek Prakash , University of Miami: <i>Leveraging quantitative physics-based approaches to investigate fluid flows in marine invertebrate larvae</i>
14:20—14:45	Clapp/Lillie	Paola Oliveri , University College London: <i>TBD</i>
14:45—15:00	Clapp/Lillie	Kate Rawlinson , Marine Biological Laboratory: <i>How do the eyeless larvae of the blood fluke Schistosoma mansoni detect light?</i>
15:00—15:30	Lillie Lobby	<i>Coffee Break</i>

Concurrent Session 3A

Chair: Vivek Prakash

15:30—15:45	Clapp/Lillie	Beverly Naigles , Marine Biological Laboratory: <i>Oocyte-derived Microtubule Projections: a Novel Putative Signaling Organelle in Oocyte Development</i>
15:45—16:00	Clapp/Lillie	Nathalie Oulhen , Brown University: <i>The ECM is really cool</i>
16:00—16:15	Clapp/Lillie	Madison Silvia , Brown University: <i>Go Nads – Puberty in the sea urchin and development of the unique transcriptional profile of gonads</i>
16:15—16:30	Clapp/Lillie	Gerardo Reyes , Brown University: <i>A collagenous extracellular matrix regulates germline gene expression in the sea star embryo</i>
16:30—16:45	Clapp/Lillie	Katrina Kulesh , Brown University: <i>Molecular and structural signatures of the oviduct in Lytechinus variegatus</i>

Saturday, April 5 (Continued)

Concurrent Session 3B

Chair: Cat Schrankel

15:30—15:45	Speck/Rowe	Tosuke Sakagami , Academia Sinica: <i>Immune regulation and metabolic exchange between the acoel Symsagittifera roscoffensis and its photosymbiont</i>
15:45—16:00	Speck/Rowe	Tanya Alessandro , Stazione Zoologica Anton Dohrn: <i>Adapting to a rotating world: the molecular regulation of circadian rhythms in echinoderm larvae</i>
16:00—16:15	Speck/Rowe	Jamie MacKinnon , Marine Biological Laboratory: <i>Plasticity of Invertebrate Cell Division in a Warming Ocean</i>
16:15—16:30	Speck/Rowe	Erin Horkan , San Diego State University: <i>Host microbe interactions Between Lytechinus pictus Larvae and Black Spot Disease Associated Bacteria, Vibrio cylcitrophicus, and Shewanella electrodiphila.</i>
16:30—16:45	Speck/Rowe	Tina Nguyen , University of Southern California: <i>Single-Larva RNA Sequencing Reveals That Red Sea Urchin Larvae Are Vulnerable to Co-Occurring Ocean Acidification and Hypoxia</i>
16:45—17:00	Speck/Rowe	Tyler Smith , Auburn University: <i>Extending the gene regulatory network underlying immune cell development in Strongylocentrotus purpuratus</i>

Business Meeting & Closing Banquet

Chairs: Zak Swartz, Elaine Seaver, Smadar Ben Tabou de Leon, Jr-Kai Sky Yu

17:00—17:30	Clapp/Lillie	Business Meeting (all welcome)
17:30—22:00	Swope	“Cape Cod Clambake” Closing Banquet