

**itm**  
**12<sup>TH</sup> INTERNATIONAL  
TUNICATE MEETING**  
**SANTA CRUZ, USA**  
**JULY 21-26, 2024**

**PROGRAM**

**Venue**

Central Conference Office Open Daily: 8:00 am–8:00 pm Phone: (831) 502-7004

Housing: College 9/ Lewis Apartment

<https://maps.app.goo.gl/XYdt6uh1pauHycSN6>

Dining hall: College 9 dining hall - morning 8:30; lunch 1:00; dinner 18:15

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Meet and Greet: outside setting in front of apartment 5 at college 9 (July 21st 19:00-21:00)

Lecture hall: Unit 1

<https://maps.app.goo.gl/b7iNTF6nCCN3rWTW7>

Poster Session Merrill Cultural Center

<https://maps.app.goo.gl/FhFZncFfy3XE6knB9>

Concurrent workshops: Unit 1 & Soc Sci 179

Banquet Merrill Cultural Center (July 25th 19:00-22:00)

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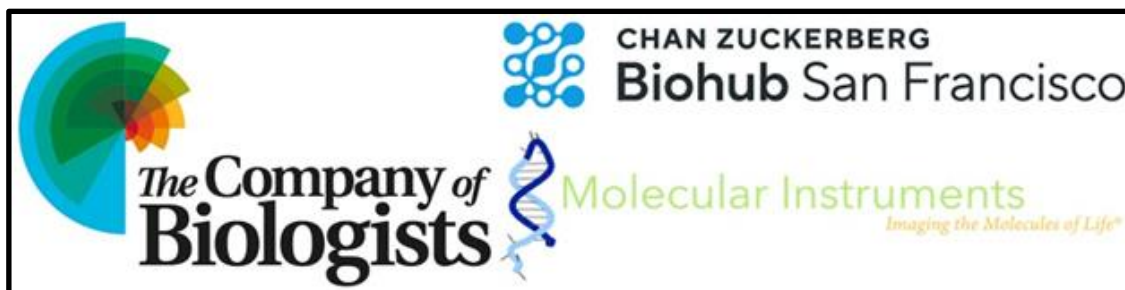
**July 21, 2024 Sunday**

18:15 Dinner College 9 dining hall

19:00-21:00 **Registration & Welcome Reception**

Outside setting in front of apartment 5 at college 9

**Sponsors:**



**Organizing Committee:** Ayelet Voskoboynik, Alberto Stolfi, Robert Zeller, Emma Farley, Brad Davidson, Billie Swalla, William Jeffery, Tony De Tomaso, Bill Smith.

## **Day 1 - July 22, 2024, Monday**

**8:15 Breakfast dining hall college 9**

### **Session 1: Modeling of Development (Chair: Emma Farley)**

**9:00-9:05 Opening remarks**

**9:05-9:45 - Keynote speaker: Prof. Christopher Lowe, Hopkins Marine Station, Stanford University, USA:** *“Characterizing the axial properties of the radial body plan of adult echinoderms”*

**9:45-10:05 - Invited speaker: Emmanuel Faure, CNRS, Montpellier, France:** *“MorphoNet 2.0: Efficient bio-curation of large 3D and 3D+t imaging datasets”*

**10:05-10:25 - Invited speaker: Yelena Bernadskaya (postdoc), New York University, USA:** *“Polarization and directionality of cell migration: enhanced navigation of embryonic micro-environments through cell force integration”*

**10:25-10:45 - Invited speaker: Kilian Biasuz (postdoc), CNRS, Montpellier, France:** *“Digital ascidian embryos: natural variation and the logical rules of animal embryogenesis”*

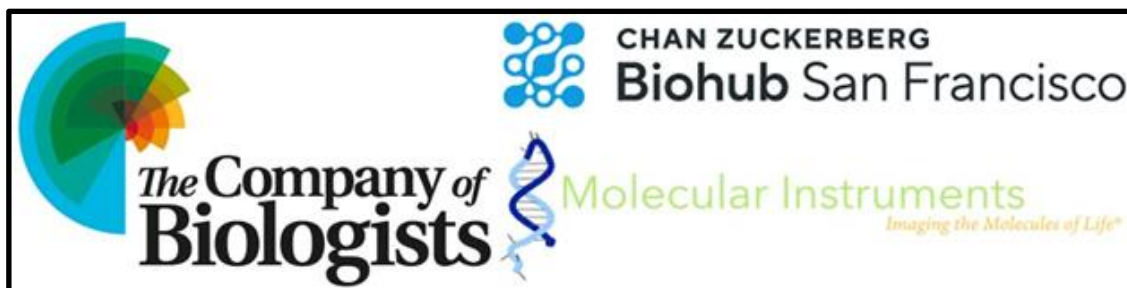
**Coffee break 10:45-11:10 (25 minutes)**

### **Session 2: Asexual Reproduction and Regeneration (Chair: Ayelet Voskoboynik)**

**11:10-11:30 - Invited speaker: Stefano Tiozzo, CNRS, Villefranche-sur-mer, France:** *“Chasing the bud: single-cell RNAseq atlas and chromosome-level genome of Botryllus schlosseri”*

**11:30-11:50 - Invited speaker: Keaton Schuster (postdoc), New York University, USA:** *“The Chordate Origins of Heart Regeneration”*

**Sponsors:**



11:50-12:10 - *Invited Speaker: Virginia Vanni (postdoc), University of Exeter, UK: "New stem cell niche for development and regeneration in Botryllus schlosseri"*

12:10-12:25 - Tal Gordon (postdoc), Hopkins Marine Station, Stanford University, USA: "Insights into the cellular and molecular mechanisms of the highly regenerative tunicate *Polycarpa mytiligera*"

12:25-12:40 - Laurel Hiebert, University of California, Santa Barbara, USA: "Maintenance of putative stem/progenitor cells during extended experimental dormancy in a colonial tunicate"

12:40-12:55 - Megan Wilson, University of Otago, New Zealand: "Unraveling the Secrets of Chordate Whole-Body Regeneration using single-cell and ATAC sequencing"

**Lunch 13:00-14:30 dining hall college 9**

### **Session 3: High throughput sequencing (Chairs: Bob Zeller, Emma Farley)**

14:30-14:50 - *Invited speaker: Tal Scully (graduate student), Harvard University, USA: "Evolution of Cell Types in Tunicate Blood"*

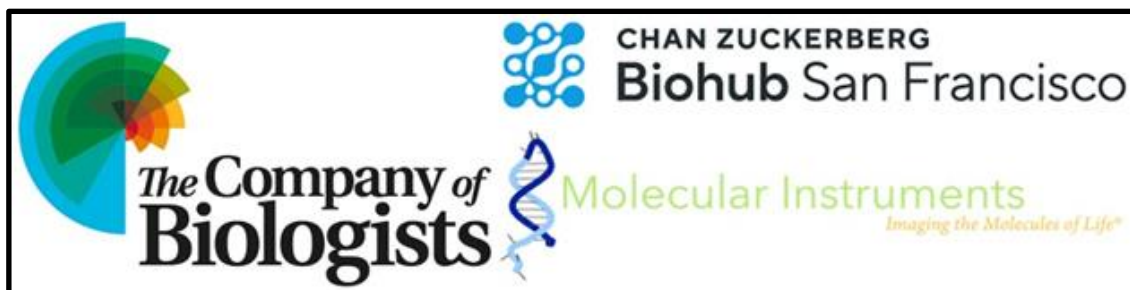
14:50-15:05 - Chen Cao, University of Texas, Dallas, USA: "The dynamics of parental allelic imbalance at single-cell resolution in hybrid prote-vertebrate lineages"

15:05-15:20 - Yishen Miao (graduate student), University of California, Santa Barbara, USA: The integration of in situ hybridization spatial and developmental lineage information with single-cell RNA sequencing datasets

15:20-15:35 Jonas Brandenburg (postdoc), Michael Sars Centre, University of Bergen, Norway: Investigating temperature stress in the ascidian *Ciona intestinalis* by single-cell genomics

15:35-15:50 Max Makem Pekouankouang (graduate student), Michael Sars Centre, University of Bergen, Norway: "Study the evolutionary biology of cardiovascular system in olfactores"

### **Sponsors:**



15:50-16:05 Wei Wang, Fang Zongxi Center, Ocean University of China: "Cellular Evolution of the Chordate heart: A Tunicate Perspective"

**Coffee Break 16:05-16:30 (25 min)**

#### **Session 4: Ecology (Chair: Noa Shenkar)**

16:30-16:50 - *Invited speaker: Eden Harel (graduate student), Tel Aviv University, Israel: "Effects of biological filtration by ascidians on microplastic composition in the water column"*

16:50-17:10 - *Invited speaker: Li-Kun Yang (postdoc), Fang Zongxi Center, Ocean University of China: "The Regulatory Mechanisms of Ascidian Larval Settlement and Metamorphosis: Insights for Developing Novel Antifouling Strategies"*

17:10-17:25 - Chiara Castelletti (graduate student), Michael Sars Centre, University of Bergen, Norway: "Systems eco-devo: towards using high-content image-based morphometrics to quantify the impacts of changing temperatures on developmental dynamics at single cell resolution"

17:25-17:40 - Raz Platin (graduate student), Tel Aviv University, Israel: "Bend, but don't break: *Styela plicata*'s mechanical response to wave stress"

17:40-17:55 - Noa Shenkar, Tel Aviv University, Israel: "Predicting the future with solitary ascidians- an holistic approach for experimenting global change effects on benthic fauna"

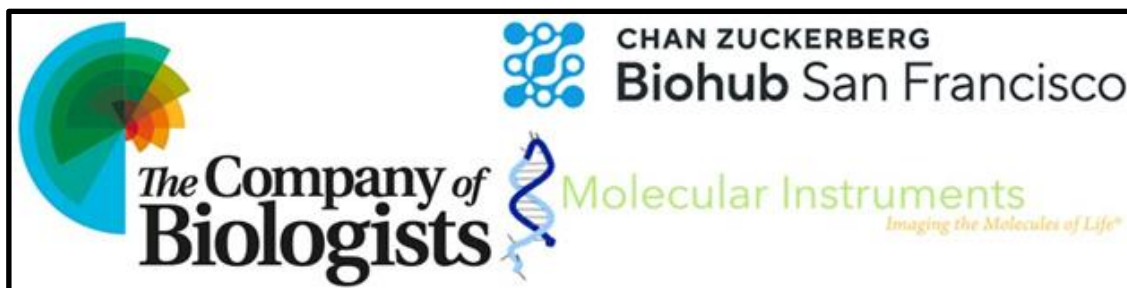
**Lightning Talks (Session A) 17:55-18:15** - Selected from poster abstracts - 3-5 minutes each, ~20 minutes total available

**Dinner 18:15 dining hall college 9**

**20:00-21:30 - Concurrent workshops on ANISEED and MorphoNet tools (locations Unit 1 & Soc Sci 179):**

ANISEED: scRNA-seq exploration (Nassif Saab)

**Sponsors:**



MorphoNet: interaction with and bio curation of 3D and 3D+t imaging datasets:  
(Tao Laurent)

## Day 2 - July 23, 2024, Tuesday

8:30 Breakfast dining hall college 9

### Session 1: Gene regulation and regulatory networks (Chairs: Bob Zeller and Bradley Davidson)

9:00-9:45 **Keynote speaker: Prof. Deidre Lyons**, Scripps Institute of Oceanography and University of California, San Diego, USA.

9:45-10:05 - *Invited speaker: Granton Jindal (postdoc), University of California, San Diego, USA: "Single base-pair changes within heart enhancers dramatically increase binding affinity and disrupt heart development"*

10:05-10:20 - Robert W. Zeller, San Diego State University, USA: "An Arduino-based platform for optogenetics experiments in transgenic embryos"

**Coffee break 10:20-10:45 (25 minutes)**

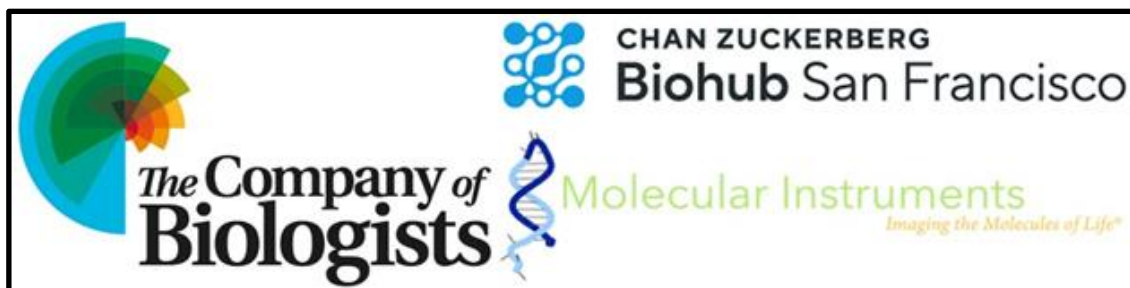
### Session 2: Adult Development, Aging, and Physiology (Chair: Lucia Manni)

10:45-11:05 - *Invited speaker: Tom Levy (postdoc), Hopkins Marine Station, Stanford University, USA: "Characterizing Germline Stem Cells And Their Function In Gonadal Regeneration Throughout The Asexual Cycle Of A Colonial Tunicate"*

11:05-11:25 - *Invited speaker: Gwynna Fuller (graduate student), Baylor College of Medicine, USA: "Molecular characterization of tunicate coronal organ mechanosensory cells"*

11:25-11:40 - Bar Gabso (graduate student), Tel Aviv University, Israel: "Learning and memory in the solitary ascidian *Polycarpa mytiligera*"

**Sponsors:**



11:40-11:55 - Chris Johnson (postdoc), Georgia Institute of Technology, USA: “A change in *cis*-regulatory logic underlying obligate versus facultative muscle multinucleation in chordates”

11:55-12:10 - Bo Dong, Fang Zongxi Center, Ocean University of China: “Spatially-resolved single-cell atlas of ascidian endostyle provides insight into the origin of vertebrate pharyngeal organs”

12:10-12:25 - Sissel Norland (postdoc), Michael Sars Centre, University of Bergen, Norway: “Exploring fine-scale behavioral changes in response to stimuli in tunicates.”

**Lunch 13:00-14:00 dining hall college 9**

### **Session 3: Early Embryogenesis (Chairs: Bob Zeller and Billie Swalla)**

14:00-14:20 - *Invited speaker: Christina Cota, Colby College, USA: “Orchestrating cell fate: Cyclin-dependent Kinase 1 (CDK1) promotes FGF receptor storage across cell division”*

14:20-14:40 - *Invited speaker: Silvia Caballero-Mancebo (postdoc), CNRS, Villefranche-sur-mer, France: “Tug-of-war between cytoplasmic and cortical forces determines the planar shape of the ascidian 4-cell stage embryo”*

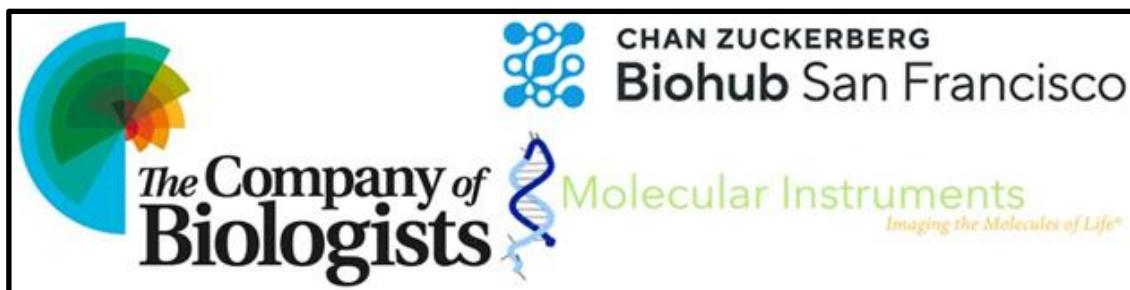
14:40-14:55 - Cathryn Haas (graduate student), Kansas State University, USA: “Signaling Mechanisms Orchestrating Asymmetric Divisions in the *Ciona robusta* b6.5 Neuromesodermal Lineage”

14:55-15:10 - Daniel Gonzalez Suarez (graduate student), CNRS, Villefranche-sur-mer, France: “Deciphering the biophysical principles of invariant cleavage pattern in a compact-type blastula”

15:10-15:25 - Shigeki Fujiwara, Kochi University, Japan: “Cell cycle regulation by Myc and the Cdk inhibitor in the *Ciona* embryo”

15:25-15:40 - Takako Saito, Shizuoka University, Japan: “Molecular and functional analysis of sperm protein s-Themis in self-incompatibility”

**Sponsors:**





**Coffee Break 15:40-16:00 (20 minutes)**

**Session 4: Late embryogenesis (Chair: Christina Cota)**

16:00-16:20 *Invited speaker: Laura Drago (postdoc), University of Padova University, Italy: "Stress granule-related genes during embryogenesis of an invertebrate chordate"*

16:20-16:40 - *Invited speaker: Atsuko Sato, Tohoku University, Japan: "Developmental buffering under thermal stress: How development can be altered by maternal environment?"*

16:40-16:55 - Andreas Midlang (graduate student), Michael Sars Centre, University of Bergen, Norway: "Characterizing biomechanics in a developing chordate nervous system"

16:55-17:10 - Lionel Christiaen, Michael Sars Centre, University of Bergen, Norway: "Cell cycle-driven transcriptome maturation confers multilineage competence to cardiopharyngeal progenitors"

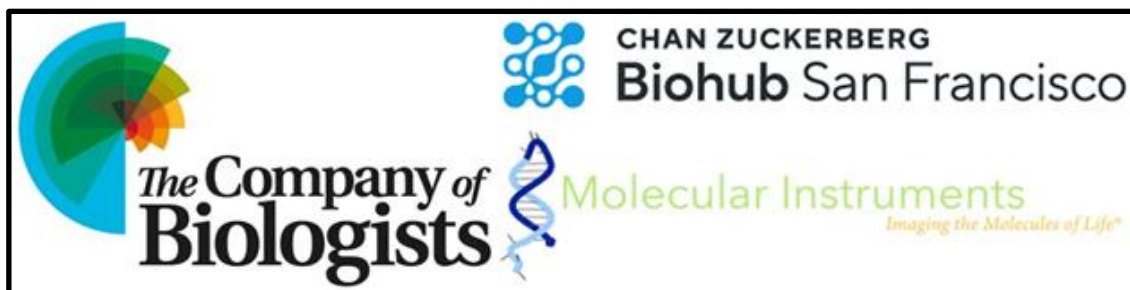
**Lightning Talks (Session B) 17:10-18:00** - Selected from poster abstracts - 3-5 minutes each, ~50 minutes total available

**Dinner 18:15 dining hall college 9**

**20:00-22:00 - Poster session**

**Day 3 - July 24, 2024, Wednesday (Excursions)**

**Sponsors:**



## Day 4 - July 25, 2024, Thursday

8:30 Breakfast dining hall college 9

### Session 1: Cell biology (Chair: Bradley Davidson)

9:00-9:20 - *Invited speaker: Hidehiko Hashimoto, Osaka University, Japan: "Dynamic separation of cell-cell contacts induces RhoA and Myosin activity to drive zippering and neural tube closure in a simple chordate"*

9:20-9:40 - *Invited speaker: Yuki S. Kogure (graduate student), Keio University, Japan: "Ciona embryo exhibits axial rotation regulating two components, twisting and bending"*

9:40-10:00 - *Invited speaker: C.J. Pickett (postdoc), Swarthmore College, USA: "Lhx3/4 initiates a cardiopharyngeal-specific transcriptional program in response to widespread FGF signaling"*

10:00-10:15 - Carolina Camelo (postdoc), Institute of Science and Technology Austria: "Geometry establishment in ascidian embryos: dissecting the cell-cell contact network topology critical for embryo shape"

10:15-10:30 - Kohji Hotta, Keio University, Japan: "Understanding Evolution and Development of Aquatic Organismal Transparency"

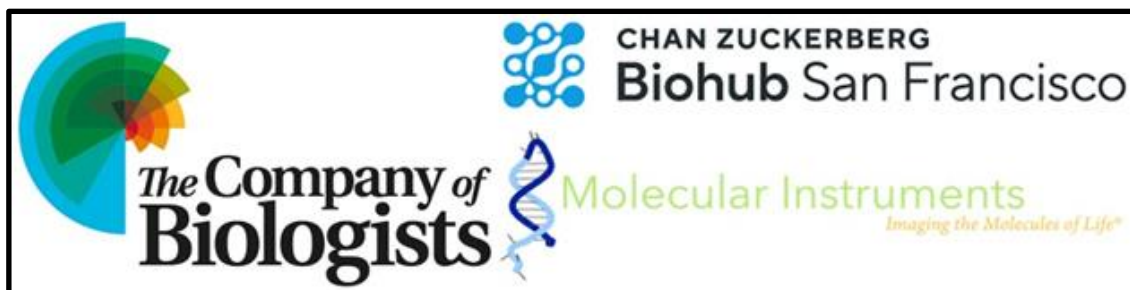
10:30-10:45 - Yuji Mizotani (postdoc), University of Chicago, USA: "Actomyosin contractility drives the redistribution of molecules for tubulogenesis"

Coffee break 10:45-11:10 (25 minutes)

### Session 2: Metamorphosis and post-metamorphic juvenile development (Chairs: Bradley Davidson and Billie Swalla)

11:10-11:30 - *Invited speaker: Eduardo Gigante (postdoc), Georgia Institute of Technology, USA: "Neck cell behaviors and differentiation controlled by Pax2/5/8, Phox2, and FGF signaling"*

Sponsors:





11:30-11:45 - Larry Dishaw, University of South Florida, USA: “Complex transkingdom interactions and host specificity underlie gut immune homeostasis in *Ciona robusta*”

11:45-12:00 - Andrea Mariosi (postdoc), Princeton University, USA: “Thyroid hormones conserved role in timing of *Ciona* metamorphosis”

12:00-12:15 - Takehiro Kusakabe, Konan University, Japan: “Transition of photoreceptor opsins during life cycle of *Ciona*”

12:15-12:30 - Ute Rothbacher, University Innsbruck, Austria: “Tunicate larval adhesion: cells, species differences and analyses of their secretions”

**Lunch 13:00-14:00 dining hall college 9**

### **Session 3: Immune system and histocompatibility (Chair: Lorian Ballarin)**

14:00-14:20 - *Invited speaker: Arun Chavan (postdoc), Yale University, USA: “Origin and diversification of gut-derived organs in chordates”*

14:20-14:35 - Nicolò Brunelli, University of Padova, Italy: “First Evidence of Mast-Cell Like Cells in a Colonial Ascidian”

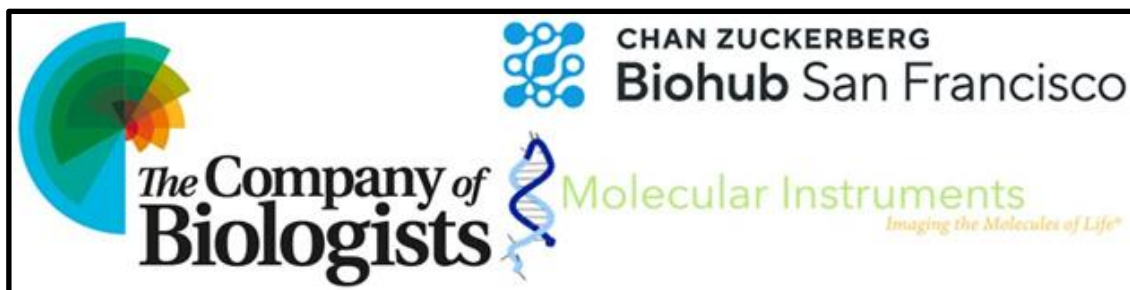
14:35-14:50 - Henry Rodriguez-Valbuena (graduate student), University of California, Santa Barbara, USA: “Evolution of a histocompatibility locus in basal chordates”

14:50-15:05 - Younes Bouallagui (postdoc), University of California, Santa Barbara, USA: “Testing the role of the kinetic proofreading model in allorecognition specificity in *Botryllus schlosseri*”

15:05-15:25 - Tony De Tomaso, University of California, Santa Barbara, USA: “The histocompatibility locus in *B. schlosseri* is a greenbeard that mediates the transplantation of germline progenitors between juveniles and adults”

15:25-15:45 - Ayelet Voskoboynik, Hopkins Marine Station, Stanford University, USA: “BHF, the *Botryllus* Gene that Predicts Fusion Rejection Outcome via Allelic Polymorphism, Aligning with Mendelian Inheritance of This Trait”

**Sponsors:**



**Coffee Break 15:45-16:10 (25 minutes)**

**Session 4: Neural development and function (Chair: Alberto Stolfi)**

16:10-16:30 - *Invited speaker: Laurence Lemaire, St. Louis University, USA: "Neural crest lineage in the proto-vertebrate model Ciona"*

16:30-16:45 - Marina Takahashi (graduate student), Keio University, Japan: "Single-cell gene expression profiles of the developing cell-autonomously oscillating motor neuron MN2"

16:45-17:00 - Sydney Popsuj (graduate student), Georgia Institute of Technology, USA: "Regulation of Motor Neuron Development in *Ciona robusta*"

17:00-17:15 - Nanako Okawa (postdoc), Osaka University, Japan: "Investigation of neuron-glia interactions using optogenetics in *Ciona* swimming larvae"

17:15-17:30 - Hina Mizutani (graduate student), Keio University, Japan: "Measurement of neuronal activities and swimming behavior during larval development in *C. intestinalis* type A"

17:30-17:45 - Ayana Maruo, Konan University, Japan: "Spatial transcriptomic analysis of the *Ciona* adult brain"

17:45-18:00 - Janeva Chung (graduate student), University of Santa Barbara, USA: "Investigating the role of neuronal oscillators in phototactic behavior in *Ciona* larvae"

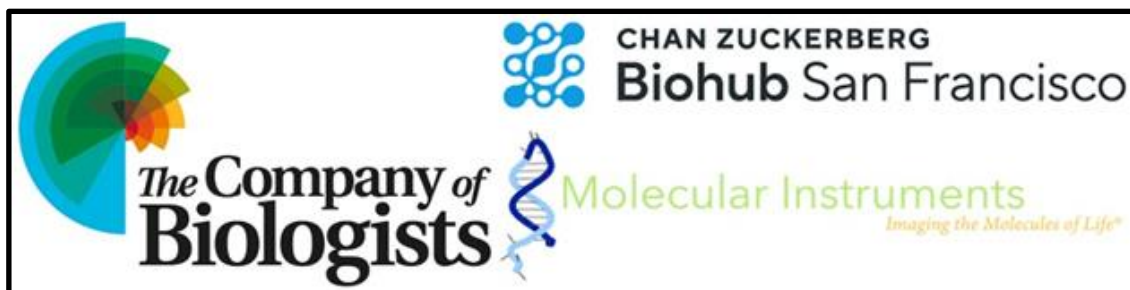
**19:00 Banquet dinner Merrill Cultural Center**

**Featuring Paul Contos Brazilian jazz trio**

**Day 5 - July 26, 2024, Friday**

**Session 1: Systematics and taxonomy (Chairs: Billie Swalla and Tony De Tomaso)**

**Sponsors:**



9:00-9:20 - *Invited speaker: Mai-Lee Van Le (graduate student), Humboldt University, Germany: "Comparative anatomy of endostyles in Appendicularia: cladistic interpretation and functional implications"*

9:20-9:35 - Nicholas Gulnick (graduate student), Coastal Carolina University, USA: "Furthering Ascidian Taxonomy through the use of Molecular Markers"

9:35-9:50 - Lauren Stefaniak, Coastal Carolina University, USA: "The Perophoridae (Chordata, Ascidiacea) of Belize: identification by molecular and morphological taxonomy combined"

9:50-10:05 - Marie Nydam, Soka University of America, USA - "Phylogenomics and systematics of botryllid ascidians, and implications for the evolution of allorecognition"

10:05-10:20 - Arzu Kahrahan, Middle East Technical University, Türkiye: "Didemnids along the Turkish Coastlines: Their Symbionts and Bioactive Secondary Metabolites"

**Coffee break 10:20-10:40 (20 minutes)**

## **Session 2: Evolution and evo-devo (Chairs: Billie Swalla and Bradley Davidson)**

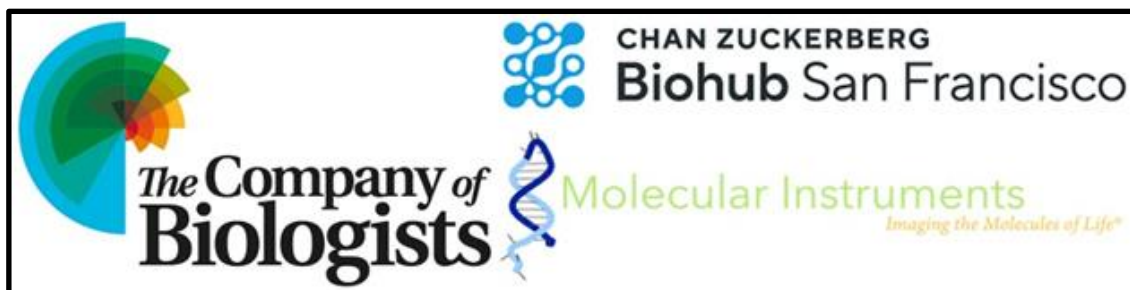
10:40-11:00 - *Invited speaker: Alfonso Ferrandez-Roldan (postdoc), University of Barcelona, Spain: "Oikopleura dioica, the evolution of a free lifestyle plenty of losses, expansions and scrambling"*

11:00-11:15 - Naohiro Hasegawa, Hiroshima Shudo University, Japan: "From solitary to colonial with zooid miniaturization: ancestral-state reconstruction based on NGS data of stolidobranch ascidians"

11:15-11:30 - David E.K. Ferrier, University of St. Andrews, UK United Kingdom: "The major effector of the canonical Wnt signalling pathway, Tcf/Lef, at the transition from invertebrates to vertebrates."

11:30-11:45 - Bradley Davidson, Swarthmore College, USA: "The evolution of reincarnation? – Acquisition of polymorphism in the doliolids."

**Sponsors:**



11:45-12:00 - Billie Swalla, Friday Harbor Laboratories, University of Washington, USA:  
"The Tale of Degenerate Ascidian Tails"

12:00-12:15 - Thomas Stach, Humboldt University, Germany: "Exploring the diversity of  
nervous systems in Appendicularia"

***Closing remarks***

**Lunch 13:00-14:00**

**14:00-15:30 Roundtable on ANISEED**

**Sponsors:**

