



Emergent Mechanisms in Biology of  
Robustness, Integration & Organization

*Emergence: A biweekly newsletter of discovery, education, and outreach from the EMBRIO Institute*

Issue 31: February 14, 2024

## DIRECTORS' NOTE

EMBRIO held its second annual Winter Science Retreat last week in Indianapolis, with thrust and site leaders and key investigators of the Institute together in person. Marking the middle of year three of our Institute, thrust leaders presented recent research findings, along with updates to research goals, insights into challenges and existing gaps, with plans for remaining NSF period three activity. Open discussions and input took place on [updating integration goals of our strategic plan](#), the use of generative AI in science writing, and authorship guidelines. The leadership team is currently discussing an Institute policy regarding generative AI use for written and science products produced under support of EMBRIO Institute funding. With respect to authorship, please note that EMBRIO agreed in our NSF awarded proposal to adhere to the International Committee of Medical Journal Editors for authorship credit. Refer to [ICMJE for authorship guidelines](#), with all involved in collaborations to have authorship discussions early and often.

Our third annual Summer School (previously referred as Training Workshop) will be held July 8<sup>th</sup> – 10<sup>th</sup>, followed by our All-Hands Annual Meeting, July 11<sup>th</sup>-12<sup>th</sup>, both hosted in-person at Purdue. Please complete this [RSVP](#) for either/ both events asap. Calendar invites were emailed to all members. The theme for the Summer School will be:

### **Communicating your research with novice audiences through computational media**

Participants will identify a topic of their research (or teaching) that they want to make accessible to novice audiences. Following best practices of learning design or mentoring, participants will create a product (e.g., a computational Colab notebook, a digital poster, a Prezi presentation, or similar) to teach or communicate their selected topic to broader audiences. The products will be broadly disseminated through the Institute.

Jeremy Zartman, Greg Reeves, and Linlin Li have organized an EMBRIO workshop during the The Allied Genetics Conference (TAGC24), March 9<sup>th</sup> 2-4pm, in Washington D.C. (Genetics Society of America). <https://genetics-gsa.org/tagc-2024/>. Titled **Advancing Computational Developmental Biology: Integrating Experimental and Computational Systems Approaches**, speakers include Drs. Zartman, Reeves, Kumar, Deng, W. Zhang, Glazier, Brubaker, and Li. A description and full schedule are in this issue.

For those yet to sign the **Data Sharing Policy**, use this URL (you can use your mouse to sign, or if using phone/tablet your finger):

[https://purdue.ca1.qualtrics.com/jfe/form/SV\\_25Zs5169Rs1MCNg](https://purdue.ca1.qualtrics.com/jfe/form/SV_25Zs5169Rs1MCNg)

Our next all-hands session is planned for February 26<sup>th</sup> as an open forum, where the leadership team will provide an update on the state of the Institute with open discussion and feedback, plus a brief overview of Student Leadership Council opportunities. Take advantage of related outside professional development opportunities including the Chicago Cytoskeleton Lightning Talks and Poster Session, March 15 (details in

this issue), a series at Purdue on [open science and research data management](#) (next up is on March 1<sup>st</sup> “Introduction to the Open Science Framework: A platform to facilitate open research and scholarship” with Dr. Reid Boehm), and a [future mentors program for graduate students](#).

David, Chris, Stephanie, Anjali, Janice, Jeremy, and Brent

### Notable Quote

*Darkness cannot drive out darkness: only light can do that. Hate cannot drive out hate: only love can do that.* ~Rev. Dr. Martin Luther King, Jr. [February is Black History Month.](#)

## QUICK LINKS

[Sign the Data Sharing Policy Agreement](#)

[RSVP: EMBRIO Summer School & Annual Meeting](#)

[All-Hands Meetings Recordings](#)

[Orientation to EMBRIO](#)

[ABIDES Culture and Mentoring resources](#)

## EMBRIO SUMMER SCHOOL

**July 8-10, 2024.** Summer School (followed by the Annual Meeting, July 11-12<sup>th</sup>). Hosted at Purdue, Please complete this [RSVP](#) asap.

**EMBRIO INSTITUTE’S 3<sup>rd</sup> ANNUAL SUMMER SCHOOL: Communicating your research with novice audiences through computational media.**

Participants will identify a topic of their research (or teaching) that they want to make accessible to novice audiences. Following best practices of learning design or mentoring, participants will create a product (e.g., a computational Colab notebook, a digital poster, a Prezi presentation, or similar) to teach or communicate their selected topic to broader audiences. The products will be broadly disseminated through the Institute.

EMBRIO Institute's 2<sup>nd</sup> Annual Summer Training Workshop took place July 10-12, 2023. [Workshop Schedule of Sessions](#). Hosted by Dr. Jeremiah Zartman at the University of Notre Dame with a theme of *Image Acquisition, Processing, and Analysis*, tutorials and hands-on sessions were specifically aimed at benefiting trainees from both computational and experimental domains. Slides, handouts, and video recordings from this workshop are available on our shared Box account: <https://app.box.com/s/mzo5ihlqiq4tfeig2psx2l6rmmdxto0c>

## EMBRIO ALL-HANDS ANNUAL RETREAT

**EMBRIO INSTITUTE’S 3<sup>rd</sup> ANNUAL ALL-HANDS MEETING: July 11-12, 2024, at Purdue University.** Please complete this [RSVP](#) asap. Last year the annual meeting brought more than sixty EMBRIO members

engaging in research talks, poster presentations, programmatic discussions, and informal gatherings. A call for posters and talks will be forthcoming.

## EMBRIO WORKSHOP AT TAGC24

**Title:** Advancing Computational Developmental Biology: Integrating Experimental and Computational Systems Approaches

**Date/Time:** Saturday, March 9, 2:00-4:00 pm

**Description :** This workshop delves into the integration of experimental and computational approaches in systems developmental biology, with talks covering the majority of model systems included in TAGC including *Drosophila*, zebrafish, mammalian cells, and plants. Participants will explore computational modeling approaches, including mechanistic models that are calibrated or tested through a combination of optogenetics, live tissue imaging, and genetics. The workshop aims to foster a synergy between modeling and experiments, providing attendees with transferable skills and knowledge to advance their research in developmental biology through the application of mechanistic and data-driven computational approaches. The focus on computational modeling, including ODE and PDE models differentiates this workshop from other platform sessions.

**Organizers :** Dr. Jeremiah Zartman, Dr. Gregory Reeves Dr. Linlin Li

### **Schedule:**

Time: 2:00 pm, Dr. Jeremiah Zartman, University of Notre Dame, Title: Introductory remarks

Time: 2:05 pm, Dr. Gregory Reeves, Texas A&M University, Title: Can We Make Developmental Biology as Quantitative as Chemical Engineering?

Time: 2:20 pm, Dr. Nilay Kumar, University of Notre Dame, Title: Piezo regulates epithelial topology and promotes precision in organ size control

Time: 2:35 pm, Dr. Qing Deng, Purdue University, Title: Modeling immediate calcium wave after tailfin amputation in zebrafish

Time: 2:50 pm, Dr. WeiWei Zhang, Purdue University, Title: Decoding Ca<sup>2+</sup> signatures and signaling to the actin cytoskeleton in plant immune response.

Time: 3:05 pm, Dr. James Glazier, Indiana University Bloomington Title: Using Virtual Tissue Computer Simulations to Explore Biological Mechanisms Across Scales

Time: 3:25 pm, Dr. Dougla Brubaker, Case Western Reserve University, Title: Bridging Animal and Human Biology via Computational Systems Biology Approaches

Time: 3:45 pm, Dr. Linlin Li, Purdue University, Title: Modeling the BMP patterning formation of Zebrafish Embryo with Quantitative Analysis of Imaging Data

## STUDENT LEADERSHIP COUNCIL CORNER

The SLC is recruiting new officers to represent your university and your perspective for EMBRIO. Reach out to David Gazzo (dgazzo@nd.edu), incoming president, for more information, and [log your ideas for future topics or events](#) that the SLC could organize. [Access SLC slides and documents](#), and consider [signing up to give or receive mentoring](#) for/from EMBRIO trainees in helping support and orient to the EMBRIO mission and interdisciplinary framework.

## EMBRIO ABIDES (Access, Belonging, Inclusion, Diversity, Equity, Support)

Dr. Anjali Iyer-Pascuzzi, EMBRIO ABIDES Director and Professor at Purdue, leads activities for Institute members. A [session on mentorship and project management](#) was presented January 29<sup>th</sup>. A series of

mentoring topics were presented at the beginning of Weekly meetings this past Fall, and a continuation of the Mentoring Panel topics from the annual retreat was presented October 23<sup>rd</sup> during the EMBRIO Weekly with a deeper dive into how culture impacts our mentoring and team thinking.

BTW, if you missed “The role of culture and communication in mentoring” mini-workshop – [view it here](#), or the previous “mentoring snacks” check out the slides and resources in the ABIDES > [Mentoring folder](#), and listen to “[The Secret of Great Teams](#)” episode of The Hidden Brain podcast.

## JOURNAL CLUBS

### Journal Club on Calcium Imaging Techniques meets Monday’s 11am ET

Due to the need within our EMBRIO community to process and analyze Ca<sup>2+</sup> Images, Dr. Norma Perez Rosas ([nperezro@purdue.edu](mailto:nperezro@purdue.edu)) is helping lead this club in discussing papers regarding methods and tools for analyzing calcium imaging. **The goal, beyond integrating these techniques, is to write a review paper.** The Club is meeting weekly on Mondays at 11am. Please contact Norma about participating.

### Journal Club on Multimodal Functions of Calcium in Tuning and Regulating Cytoskeleton Networks

Please contact Dr. Linlin Li ([li2212@purdue.edu](mailto:li2212@purdue.edu)) for information. The club is in the writing stage for organizing and publishing a review paper on the topic. It isn’t too late to join. Here is the link to the current working documents:

[https://docs.google.com/document/d/1Cpg77ytioWiluRmiDMCcAiAd4jNNX\\_J7s64RQk8xOU/edit?usp=sharing](https://docs.google.com/document/d/1Cpg77ytioWiluRmiDMCcAiAd4jNNX_J7s64RQk8xOU/edit?usp=sharing)

## UPCOMING DEADLINES, IMPORTANT DATES, & INFO

EMBRIO All-hands Meeting Schedule, Monday’s 3-4pm ET. [Zoom](#). [All Hands Zoom Meeting Recordings](#)

Jan	8	Thrust 4 Seminar
	15	No Meeting: MLK Day
	22	<del>BII Conference—NSF Headquarters and Zoom</del>
	29	ABIDES topic: Project Management
Feb	5	break
	12	postponed
	19	break
	26	Open Forum: State of the Institute and open discussion
March	4	break
	11	No Meeting: Spring Break
	18	Thrust 2 Seminar

	25	break
April	1	Guest Speaker TBD
	8	break
	15	Thrust 1 Seminar
	22	break
	29	Trainee topic or Speaker TBD
May	6	Thrust 3 Seminar
	13	break
	20	Speaker TBD
	27	No Meeting: Memorial Day

**March 6-10, 2024.** The Allied Genetics Conference (TAGC24). Washington D.C. (Genetics Society of America). <https://genetics-gsa.org/tagc-2024/> See details above.

**March 15, 2024.** Chicago Cytoskeleton Lightning Talks and Poster Session, Northwestern University, Feinberg School of Medicine. (see details below)

**July 8-12, 2024.** Summer School & Annual Meeting. Hosted at Purdue, Summer School will be July 8<sup>th</sup> – 10<sup>th</sup>, followed by our All-Hands Annual Meeting, July 11<sup>th</sup>-12<sup>th</sup>. Please complete this [RSVP](#) asap. See details above.

**Spring Semester Series on Empowering Research: A Trio of Open Science Workshops to Ignite Innovation. (in person only) [Website](#)**

**Workshop #2: Unleashing Open Research Potential with Reid Boehm, Ph.D.**

**“Introduction to the Open Science Framework: A platform to facilitate open research”**

Date: March 1, 2024

Time: 10:00 to 11:15 AM

Location: WALC 2051

On March 1st, explore the Open Science Framework (OSF) with Dr. Reid Boehm, Research Data Systems Manager. The OSF is a free platform that supports researchers in managing, sharing, and collaborating on projects. Gain insights into its features, functions, and flexible utilities that cater to diverse aspects of the open research process. This workshop is your gateway to harnessing the benefits of OSF as a Purdue University affiliate.

**Workshop #3: Navigating Open Access Publishing with Nina Collins, M.L.I.S.**

**“Open Access Publishing: Opportunities and pathways for wider dissemination of your scholarship”**

Date: April 1, 2024  
Time: 10:00 to 11:15 AM  
Location: WALC 2051

Join Nina Collins, an advocate for Open Access, to navigate the world of Open Access publishing. This workshop will delve into the challenges researchers face and uncover the multitude of pathways available for Purdue authors. Learn how Open Access Publishing Partnerships can remove financial barriers, providing opportunities for broader dissemination, use, and impact of your scholarly work. Don't miss this chance to explore ethical publishing practices and increase your scholarly impact.

Embark on this comprehensive exploration of Open Science and equip yourself with the tools and knowledge to drive your research forward. We invite you to attend these workshops, engage with experts, and contribute to the vibrant culture of openness and collaboration in our academic community.

**Course – HONR 59901 Future Mentors Program Research Mentorship Training for Graduate Students (at Purdue, in person only).** [More info and to apply.](#)

#### **Purpose of the Program**

Effective mentorship requires specific skillsets and approaches. Implementation of these strategies can lead to mutually beneficial experiences for both mentors and mentees. The Future Mentors program offers research mentorship training for graduate students who are or would like to begin mentoring undergraduates in STEM research. This program is ideal for doctoral students who plan to pursue a career in academia or leadership roles in industry.

#### **The March Chicago Cytoskeleton meeting and poster contest is coming up soon, Friday March 15.**

Contact Holly Goodson ([hgoodson@nd.edu](mailto:hgoodson@nd.edu)) with questions or concerns!

At this meeting, we will have four regular (20 +10 minute) talks, plus the yearly CC poster session. And, as last year, we are holding an associated **lightning talk contest** to determine who are the four trainees who will speak April 19th alongside our plenary speaker **Dan Fletcher** (UC Berkeley). The winners of this contest will be announced at the March 15 meeting.

*Speakers March 15 will be:*

Noah Mitchell (KITP; incoming faculty member at University of Chicago)

Katie Drerup (University of Wisconsin - Madison)

Dileep Varma (Northwestern Feinberg School of Medicine)

Greg Smith. (Northwestern Feinberg School of Medicine)

*Titles to come soon!*

#### **Key points about the lightning talk contest and poster session:**

*Did you or someone in your lab present a lightning talk or poster at ASCB, Biophysics, or another conference? Give that presentation a new life through Chicago Cytoskeleton! Or perhaps you want to put together a new presentation? CC is a great place to try it out!*

• **If you want to compete for an April 19 speaker slot:** please submit (details below) a **pre-recorded 3-5 minute lightning talk** that will be viewed and judged by the Steering Committee.

> **The Deadline for submitting your recording is Wednesday March 6.**

- **If you just want to present a poster** without competing: please simply submit an abstract by the same deadline (Wednesday March 6).

*More information about the poster session and associated competition is provided below.*

*CC Meeting Place and time:* Sessions are held in the Lurie Medical Research Center at the Feinberg School of Medicine. For the March 15 meeting, talks will start at 3:00 and continue until ~5:00, followed by the poster session with refreshments. There is no registration fee - just join us!

*Parking:* If you would like a **parking coupon**, please fill out this form (coupons will be distributed at the meeting): <https://forms.feinberg.northwestern.edu/view.php?id=2879544>

We look forward to seeing you Friday March 15!

-Holly Goodson and the Chicago Cytoskeleton Steering Committee

**\*\*\*\*\* LIGHTNING TALK AND POSTER ABSTRACT SUBMISSION INFO\*\*\*\*\***

***If you want to participate in the lightning talk competition:***

**1)** Please ASAP send an email to me ([hgoodson@nd.edu](mailto:hgoodson@nd.edu)) with the subject line "CC lightning talk competition." I'll then email you a non-public Google Drive link into which you can submit your e-poster talk as well your abstract *and* (recommended but not required) a PDF of the associated poster. *The only people with access to this link will be the poster submitters and the Steering Committee.*

**2)** Please create in this Google Drive a folder with you name, and put in this folder:

i) your pre-recorded lightning talk (3-5 minutes)

ii) the abstract for the associated poster (we will put this along with the other abstracts in the ebooklet for the March 15 meeting)

iii) a PDF of your poster (helpful but not required for following along with your talk; if you prefer, you can submit slides instead of a poster).

>> Please upload all this information by the **deadline of Wednesday March 6.**

***If you simply want to present a poster March 15:***

By **Wednesday March 6**, please send an email to me ([hgoodson@nd.edu](mailto:hgoodson@nd.edu)) with the subject line "CC poster abstract", and **attach your abstract in .docx format**

> Please be sure to include the title (!), authors, and affiliations in your file.

> Please be sure to use .docx and not PDF.

Other notes:

- **For your recording**, please use Zoom or a similar method, presenting your poster via presenter mode.

Alternatively, you could prepare and present separate slides. Either works.

- Please keep the talk and poster to reasonable sizes - less than 25MB if possible.

- Please let me ([hgoodson@nd.edu](mailto:hgoodson@nd.edu)) know if you have any questions or concerns!

## Hot Off the Press: New EMBRIO Journal Papers

*Let us know about new papers you want to highlight for the EMBRIO community!*

### REMINDER: EMBRIO Acknowledgement for Scholarly Papers and Posters.

For EMBRIO related research publications, NSF requires acknowledgement of EMBRIO NSF funding for our Institute to claim the work in our reporting back to NSF. Please include the following acknowledgement in your journal and conference papers and posters: **"This work is based upon efforts**

supported by EMBRIO Institute, contract #2120200, a National Science Foundation (NSF) Biology Integration Institute.”

## Awards

Phase II Grant Proposal Award: Design and Instruction of a Team-Based Transdisciplinary Cross-Listed Course in Computational Understanding of Biological Systems and Data. (Ladd, B., Evans, J., Magana, A., Pienaar, E.). \$43,448. Issued by Purdue University Innovation Hub · Jan 2024

## New Lab Members?

Did you recently have new students or staff members join your EMBRIO projects? We want to add them to the listserv, Box account, demographics survey, and Personnel List for ensuring their inclusion in communications and participation. If they are not already on our Personnel spreadsheet ( <https://app.box.com/s/frd9275xc069gmtbe3y1osoz1j7ssk7> ), or they have graduated, let Brent know their names and email contacts ([laddb@purdue.edu](mailto:laddb@purdue.edu) )

Submit your items for the next newsletter by **Feb. 23** to Brent ([laddb@purdue.edu](mailto:laddb@purdue.edu))