



Emergent Mechanisms in Biology of
Robustness, Integration & Organization

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

Issue 32: February 28, 2024

DIRECTORS' NOTE

As we march toward spring (and spring break), we'll have to cope with an extra day in February tomorrow, apparently the 2nd least favorite month next to January. Take heart, there are many signs that spring is just around the corner. The local weather czar near Purdue predicts we'll hit 70F on Sunday.

Thanks to all who tuned in on Monday for the Directors update. If you missed it, you can watch the recording on Box (All-Hands Meeting Recordings > 2024 > [2024-02-28 All-Hands Directors-Update](#)). Following spring break(s), our next all-hands seminar on March 18th will feature Dr. Jeremy Zartman presenting the research in Thrust 2b. It was announced that our third annual Summer School (previously referred as Training Workshop) will be held July 8th – 10th, followed by our All-Hands Annual Meeting, July 11th-12th, both hosted in-person at Purdue. **Please complete this [RSVP](#)** for either/ both events. Calendar invites have been emailed to all members. The theme for the Summer School will benefit all Institute members (more in this issue).

The Gardner lab is conducting the third annual evaluation survey supporting both Thrust 4 research into the interdisciplinary nature of the Institute, as well as supporting continual improvement and feedback for the structure and functioning of EMBRIO. **Individual emails were delivered to each active member's inbox on Monday via the Qualtrics Survey System. Please complete this mandatory survey by March 8th at the latest!** In addition, an NSF BII-wide effort that is supported with an RCN grant, is gearing up to develop targeted mentoring resources and trainings for everyone engaged in interdisciplinary research. The working group has requested that EMBRIO members participate in this input survey [RCN interdisciplinary mentorship survey](#).

A reminder that there are still members who have not yet signed the Institute's **Data Sharing Policy**. PI's make sure those in your lab working on EMBRIO research [use this URL to review and sign](#) (you can use your mouse to sign, or if using phone/tablet your finger).

On Wednesday, March 6th, Dr. Elsje Pienaar and the BME Dept. at Purdue is hosting Dr. [Melissa Kemp](#), who is the Carol Ann and David D. Flanagan Professor of BME at Georgia Tech/Emory for our BME department seminar. (9:30 a.m. in MRGN 121, Zoom link TBD). She is a leader in systems biology and analytical methods to study how cell populations respond metabolically to oxidative stress, and how inter-cellular variability and protein networks affect these responses in stem cells, cancer cells and other systems. She has also led several multi-site NSF centers and won multiple graduate mentoring awards. If you are interested in meeting with her on March 5th, during the day or for a meal, [please add your name to this schedule document](#) (available spots or highlighted in yellow).

Jeremy Zartman, Greg Reeves, and Linlin Li have organized an EMBRIO workshop during The Allied Genetics Conference (TAGC24), March 9th 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. We will endeavor to share the slide decks from the workshop.

Take advantage of related outside professional development opportunities including the Chicago Cytoskeleton Lightning Talks and Poster Session on March 15 (details in this issue), a series at Purdue on [open science and research data management](#) (next up is on March 1st “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](#). Stay tuned for an announcement of the 2024 [CompuCell3D](#) summer workshop dates (typically in late July and early August) that EMBRIO members have benefited from the last few years.

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

Notable Quote

"Never be limited by other people's limited imaginations." - Dr. Mae Jemison, first African American female astronaut. [February is Black History Month.](#)

QUICK LINKS

[Sign the Data Sharing Policy Agreement](#)

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

[All-Hands Meetings Recordings](#)

[RCN interdisciplinary mentorship survey](#)

[Orientation to EMBRIO](#)

[ABIDES Culture and Mentoring resources](#)

EMBRIO SUMMER SCHOOL

July 8-10, 2024. Summer School (followed by the Annual Meeting, July 11-12th). Hosted at Purdue, Please complete this [RSVP](#) asap. All Institute members are encouraged to participate. There may be room for graduate TA's at Purdue outside of EMBRIO to also participate.

EMBRIO INSTITUTE'S 3rd 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 2nd 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 3rd 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 Ca²⁺ 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. Douglas 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 29th. 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 23rd, 2023 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 Ca²⁺ Images, Dr. Norma Perez Rosas (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) 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

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	BII Conference – NSF Headquarters and Zoom
	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 2b Seminar
	25	break
April	1	TBD: “Promoting Reproducible Science: How to manage and share your research data”.
	8	break
	15	Thrust 1 Seminar
	22	break
	29	Thrust 1 Seminar
May	6	Thrust 3a Seminar
	13	break
	20	Thrust 3b Seminar
	27	No Meeting: Memorial Day

March 5-6, 2024. Dr. Elsje Pienaar and the BME Dept. at Purdue is hosting Dr. [Melissa Kemp](#), who is the Carol Ann and David D. Flanagan Professor of BME at Georgia Tech/Emory for our BME department seminar. (9:30 a.m. in MRGN 121, Zoom link TBD). She is a leader in systems biology and analytical methods to study how cell populations respond metabolically to oxidative stress, and how inter-cellular variability and protein networks affect these responses in stem cells, cancer cells and other systems. She has also led several multi-site NSF centers and won multiple graduate mentoring awards. If you are interested in meeting with her on March 5th, during the day or for a meal, [please add your name to this schedule document](#) (available spots or highlighted in yellow).

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 8th – 10th, followed by our All-Hands Annual Meeting, July 11th-12th. 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) 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) 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) 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) 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!

[Check out our Google Scholar Page](#)

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

Let us know about your grants and other awards!

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](#), or they have graduated, let Brent know their names and email contacts (laddb@purdue.edu)

Submit your items for the next newsletter by **March 15th** to Brent (laddb@purdue.edu)