



Emergent Mechanisms in Biology of  
Robustness, Integration & Organization

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

Issue 22: September 20, 2023

### DIRECTORS' NOTE

The Autumn Equinox is upon us! As the leaves throughout the Midwest turn the golden and orange colors found in our logo, new EMBRIO research results have been published recently – check those out – citations are toward the end of this newsletter. You can also check out all of the [EMBRIO scholarly products](#) produced in our first two years. Please let Brent know of new EMBRIO research products produced so that we can share them with the community. As always, please remember to acknowledge EMBRIO and our NSF award in your publications and conference products.

We hope to see you all at the next Weekly meeting. Dr. Adrian Buganza Tepole will lead a two-part min-workshop on Physics Informed Machine Learning on September 25 and Part II on October 2. Details on the series will be shared this Friday.

For those who missed the earlier announcement, Dr. Priyanka Baloni & Dr. Anke Tukker are hosting a bi-weekly session for those in EMBRIO interested in learning R and solving their research related questions. The next session is tomorrow, Thursday, Sept. 21 4-5pm. See the details below.

Calling all trainees: The EMBRIO Student Leadership Council seeks new members to get involved, represent your institution, and your peers as the Council plans activities and input this year. Contact info and information are below. Don't wait to get involved!

We want to hear about your news and announcements. Send them to Brent ([laddb@purdue.edu](mailto:laddb@purdue.edu)) by September 29<sup>th</sup> for inclusion in the next issue of *Emergence*.

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

### Notable Quote

*"Living in discovery is at all times preferable to living through assumption.... This isn't a matter of blind belief in yourself. It's a matter of experimental faith. You work not as an evangelist, expecting miracles, but as a scientist, testing and adjusting and testing again. Experimenting and building on the results. Faith is rewarded, perhaps even more than talent or ability. — Rick Rubin, The Creative Act.*

### QUICK LINKS

[Summer workshop materials](#)

[Annual Retreat slides and posters](#)

[Weekly Update Meeting Recordings](#)

## EMBRIO MINI-WORKSHOP @ WEEKLY MEETING: Physics Informed Machine Learning.

Dr. Adrian Buganza Tepole will lead a two-part min-workshop on Physics Informed Machine Learning September 25 and October 2. Details on the series will be shared this Friday.

In case you missed the previous mini-workshop:

Dr. Linlin Li in the Umulis Lab led a two-part mini-workshop series September 11<sup>th</sup> and 18<sup>th</sup> for Solving Ordinary Differential Equations (ODEs) and Partial Differential Equations (PDEs) using Google Colab. Access the [recordings](#) and the [Google Colab](#).

## 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/1Cpg77yjtioWiluRmiDMCcAiAd4jNNX\\_J7s64RQk8xOU/edit?usp=sharing](https://docs.google.com/document/d/1Cpg77yjtioWiluRmiDMCcAiAd4jNNX_J7s64RQk8xOU/edit?usp=sharing)

## R CAFÉ SERIES – FALL SEMESTER

Dr. Priyanka Baloni & Dr. Anke Tukker are hosting a bi-weekly session for those in EMBRIO interested in learning R and solving their research related questions. Participants only need to bring their laptop with [R and R studio installed](#). We will have an interactive session where we try to solve coding related questions and learn new things related to data analysis and visualization using R. We invite everyone to work on their own R projects, ask questions and learn from each other.

The first session was held Sept. 6<sup>th</sup>. Those interested in learning or brushing up on using R for data analysis, sessions of R Café will be on Thursdays 9/21, 10/12, 10/26, 11/9, 11/30, 12/14, 4-5 pm in DLR 323 or virtual link <https://purdue-edu.zoom.us/j/3998037199> (please note this day and time change compared to previous announcements).

## 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](mailto:dgazzo@nd.edu)), Feyisayo Akande ([fakande@purdue.edu](mailto:fakande@purdue.edu)), and Jazzmin Owens ([jazzmin.owens@morehouse.edu](mailto:jazzmin.owens@morehouse.edu)) 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 SUMMER WORKSHOP RESOURCES

EMBRIO Institute's 2<sup>nd</sup> Annual Summer Training Workshop took place July 10-12. [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 MATERIALS

EMBRIO Institute's Annual Retreat was hosted in the Weldon School of Biomedical Engineering on the Purdue University West Lafayette Campus, July 13-14, 2023. The annual retreat brought together the large majority of EMBRIO members in one physical place, with more than 60 of us engaging in research talks, poster presentations, programmatic discussions, and informal gatherings. Slide decks and posters from the annual retreat can be accessed here: <https://app.box.com/s/rmsiuvydlsccezhugyjp2b5v72xlg9l>

## 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 series of mentoring topics will be presented at the beginning of Weekly meetings, and a continuation of the Mentoring Panel topics from the annual retreat will be presented October 23<sup>rd</sup> during the EMBRIO Weekly time.

## UPCOMING DEADLINES, IMPORTANT DATES, & INFO

EMBRIO Weekly Meeting, Monday's 3-4pm ET. [Zoom link](#).

Aug	14	Benchling Workshop - SLC (Feyisayo)
Aug	21	Student Leadership Council - Grads and Postdocs Only Session
Aug	28	Faculty Investigators Only
Sept	4	Labor Day no meeting
Sept	11	Dr. Linlin Li: Part I: Solving mathematical modeling with ODE or PDE in MatLab or Python (Google Colab)
Sept	18	Dr. Linlin Li: Part II: Solving mathematical modeling with ODE or PDE in MatLab or Python (Google Colab)
Sept	25	Dr. Adrian Buganza Tepole: Part I: Physics informed machine learning
Oct	2	Dr. Adrian Buganza Tepole: Part II: Physics informed machine learning
Oct	9	Fall Break - no meeting
Oct	16	TBD

Oct 23 ABIDES: Mentoring Workshop (in person, DLR 221) followed by EMBRIO Image Analysis Workstation Open House DLR 203

The EMBRIO Weekly will adapt to a new format the second half of the semester. The intention is to focus more time for research thrust projects to meet with cross talk between the thrusts, while dedicating one week a month to a trainee topic, and periodic research talks. Twice a month, the ABIDES program will feature a “10-minute mentoring snack” at the beginning of the Weekly.

**October 11-14, 2023.** The 2023 BMES Annual Meeting will be held in Seattle, WA. Thousands of biomedical engineers will attend this year’s meeting to learn, collaborate, and network. As a BMES member, you can save more than 10% with reduced early bird rates, so if you’re not already a member, now would be a good time to join! Click here for details: <https://mailchi.mp/e3958bb463f2/o8cvhb9g5x-9335625?e=ea10e317a2> **NOTE:** BME Dept. recommends booking your room at the Hyatt Regency Seattle because it’s *closer* to the convention center AND it’s where university receptions will be held (in addition to some being held *inside* the convention center). Here’s the link to reserve with the \$259 discount rate. **This rate only lasts until the allotted number of rooms have been sold.** <https://www.hyatt.com/en-US/group-booking/SEARS/G-BMES>

**October 27** – [2024 Hertz Fellowship](#) Application deadline for doctoral students.

**January 2 – 6, 2024.** BMES – CMBE Conference. San Juan, Puerto Rico. Accepting abstracts – deadline September 12. Conference details: <https://www.bmes.org/cmbe2024>

## Hot Off the Press: New EMBRIO Journal Papers

**Mim, M.S.,** Knight, C., and **Zartman, J.J.** 2023. “Quantitative Insights in Tissue Growth and Morphogenesis with Optogenetics.” (accepted, *Physical Biology*, 2023).

**Kumar, N,** Dowling, A., and **Zartman, J.J.** 2023. "Reverse engineering morphogenesis through Bayesian optimization of physics-based models." *bioRxiv* (2023): 2023-08. doi: <https://doi.org/10.1101/2023.08.21.553928>

**Kumar, , Mim, M.S.,** Levis, M., **Unger, M.,** Miranda, G., Robinett, T. and **Zartman, J.J.** 2023. "Piezo regulates epithelial topology and promotes precision in organ size control." *bioRxiv* (2023): 2023-08. doi: <https://doi.org/10.1101/2023.08.16.553584>

**Yueyang W.,** Lee D. Troughton, Fan Xu, **Chatterjee, A.,** **Ding, C.,** Zhao, H., Cifuentes, L.P., Wagner, R.B., **Wang, T.,** **Tan, S.,** Chen, J., Kuang, S., **Li, L.,** **Umulis, D.M.,** Suter, D.M., Yuan, C., **Chan, D.,** Huang, F., Oakes, P.W., and **Deng, Q.** 2023. Atypical peripheral actin band formation via overactivation of RhoA and Non-muscle myosin II in Mitofusin 2 deficient cells. *eLife* 12:e88828. <https://doi.org/10.7554/eLife.88828>

*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

## Open Positions

## 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/frd9275xc069gmgmtbe3y1osoz1j7ssk7> ), 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 **Sept. 29<sup>th</sup>** to Brent ([laddb@purdue.edu](mailto:laddb@purdue.edu))