



Emergent Mechanisms in Biology of  
Robustness, Integration & Organization

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

Issue 24: October 18, 2023

## DIRECTORS' NOTE

Welcome back to all who attended and presented at BMES in Seattle, and safe travels to all those who are attending other conferences. It is exciting to see EMBRIO research being disseminated and discussed in the broader scientific community!

Please note that due to the final format of participatory exercises planned for the cultural aspects of mentoring and teams mini workshop (originally planned for a hybrid format), the ABIDES program needs to shift this **Weekly session on Monday, October 23<sup>rd</sup> to be all online via our regular zoom link**. This mini workshop is for ALL EMBRIO members. Please plan to participate! Regarding the All-hands weekly meeting frequency and format, we need to hear from you on this: [asap, take the few minutes needed to fill the four question anonymous survey](#). BTW, if you missed the previous “mentoring snack” 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.

Learn more about your fellow EMBRIO member Abasiafak (Aby) Ndifreke Udosen in this issue. Aby is pursuing his doctorate in the Magana Lab at Purdue conducting research in Thrust 4 of the Institute focused on teamwork interactions and interdisciplinary learning. He’s also been collaborating with faculty on creating course project exercises for a new introductory EMBRIO course (more to come on this exciting development).

We’ve heard from NSF regarding the next BII Annual Conference - January 22<sup>nd</sup> – **Please hold the Date**. Details on the agenda will be shared when available. NSF is planning a hybrid one day meeting. A few of us from the leadership team will attend in person at NSF headquarters as requested, with everyone else attending via zoom.

For anyone wishing to learn and improve their use of the powerful data analysis tool fondly known as “R”, please take advantage of the bi-weekly series organized by Dr. Priyanka Baloni especially for EMBRIO trainees, staff, and faculty. The next session is tomorrow, Thursday afternoon, at 4pm (details below).

The graduate students in biology education research at Purdue have organized a seminar series this fall and have a great slate of speakers lined up. The next speaker is this Friday, October 20<sup>th</sup> at 11:30 am ET in [Zoom](#). Dr. Elli Theobald (U Washington) will be joining us virtually and her seminar is entitled: *Mind the gap: Active learning improves equity in STEM classrooms*.

We want to hear about your news and announcements. Send them to Brent (laddb@purdue.edu) by October 27<sup>th</sup> for inclusion in the next issue of *Emergence*.

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

## Notable Quote

“Nothing we accomplish in life is totally free of the influence of spirit and community. We do nothing alone.” — Tricia Hersey, [Rest Is Resistance: A Manifesto](#)

## QUICK LINKS

[R Café session \(Thursday, 4pm\)](#)

[All-hands Weekly \(Monday, 3pm\)](#)

[ABIDES Culture and Mentoring resources](#)

[Survey: Your input on Weekly meeting frequency and format](#)

[Summer workshop materials](#)

[Annual Retreat slides and posters](#)

[Weekly Update Meeting Recordings](#)

## 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 have been 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 with a deeper dive into how culture impacts our mentoring and team thinking.

## 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. The next session will be Thursday, October 5th at 4pm ET. In person in DLR 323. These are the remaining dates: 10/5, 10/19, 11/2, 11/16, 11/30, and possibly 12/14. Virtual link for any that can join in person: <https://purdue-edu.zoom.us/j/3998037199> (please note this day and time change compared to previous announcements).

## 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)

## EMBRIO Member Spotlight



### Abasiafak ("Aby") Ndifreke Udosen

Computer and Information Technology, Purdue University

Advisor/Mentor's name: Dr. Alejandra J. Magana, Ph.D

Title of my EMBRIO project: "Characterizing Teamwork Interactions and Interdisciplinary Learning in the Context of Computational Modeling and Simulation Projects"

Professional page: [LinkedIn](#)

Magana research lab page: <https://polytechnic.purdue.edu/rocketed/members>

### What's your hometown, State, Country (and one thing you love, miss, remember, or want to tell others about it)?

I am an indigene of Akwa Ibom State in Nigeria, where I spent the entirety of my childhood and most of my adult life. Throughout my formative years, one of my fondest memories was playing with homemade toys, both those I built myself and those given to me. My Dad observed my early affinity for hands-on

experiences and believed that I would succeed in Engineering, and Technology Education, so he began teaching me Mathematics very early on as a kid. Thanks to my father I still have vivid memories of riding my bike to His office during the holidays, to seek his assistance in completing my high school projects and assignments. Fast forward to August 2022, I made one of the best decisions of my life by enrolling at Purdue University. My lovely wife, Faith, and our two little buddies, Shekinah and Shemaiah, joined me on this exciting journey. As a family, we are joyfully anticipating the arrival of our third child, Shalom. Glad to say our future is bright and full of promise!

**What are your hobbies?**

I love Faith-based activities, streaming action movies, watching narrated histories on YouTube, and hanging out with family and friends.

**What drew you into becoming a scientist or engineer (or both)?**

My academic and professional journey has been profoundly influenced by the invaluable contributions of my parents. My mother is a Full Professor of Educational Technology, while my father is a consultant Architect, Founder, and Building Engineer. They both provided me with invaluable mentorship and the encouragement I required to pursue my passion in the Engineering sciences. This led to my bachelor's degree in mechanical engineering after which I proceeded to earn my master's degree in the same field, and my journey continued as I transitioned into the role of a junior lecturer, tutor, and researcher at the Department of Mechanical Engineering, University of Nigeria and the University of Cape Town, South Africa.

**Tell us the main point of your research as it relates to EMBRIO:**

My doctoral research broadly investigates teamwork interactions and interdisciplinary learning in computational modelling and simulation projects. It proposes to contribute research findings on how Engineering students, engaged in computational modelling-focused team-based projects can share mental models and learn to improve upon their model-based reasoning skills through effective collaboration and social interaction. My research ultimately falls into "Thrust 4" of the EMBRIO institute's goal which is aimed at identifying and implementing best practices in curriculum and training to support learning, meaningful engagement, and participation in integrative biology research.

I am also actively engaged in the EMBRIO Innovation Hub Grant project, where I contribute to the design of a Team-Based transdisciplinary graduate course in Computational Understanding of Biological Systems and Data. Within this project, my specific role involves applying computational fluid dynamics

methods in the development of partial differential equation (PDE) models to implement cell cytokinesis at a basic level in Python and MATLAB.

**You find yourself alone on an elevator with the president of your university – who knows very little about your field: They ask you to tell them about your research (15 seconds - go!):**

My research investigates teamwork dynamics in modeling and simulation processes within the context of a semester-long project undertaken in a Biomedical Engineering graduate course.

**What's on the horizon for you (research, career, personal, whatever you want to share)?**

I love interdisciplinary research, and I envision conducting future research in the areas of Computing and Engineering Education, Computational Modelling of thermo-fluid processes in biological systems and Integrating AI and Machine Learning approaches in these areas. After my PhD education, I look forward to collaborating with research teams in academia or industry. One of my life goals is to leverage my research experiences to make meaningful and impactful contributions to society.

**What's your various URL/social media handles that others can follow (prof. website, twitter, LinkedIn, blog, etc)?**

Kindly follow me on LinkedIn @ [Linkedin](#)

## 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), Feyisayo Akande (fakande@purdue.edu), and Jazzmin Owens (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/rmsiuvydlsccexzhugyjp2b5v72xlg9l>

## 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	<del>Open Discussion and Thrust Project Breakout Rooms</del>
Oct	23	ABIDES: Culture, Mentoring, & Teams Mini Workshop
Oct	30	TBD
Nov	6	VCell talk by Dr. Michael Blinov, Center for Cell Analysis and Modeling, UConn

To make them as relevant and useful as possible, we need your input on frequency and format for future "Weekly" all-hands meetings. **Please take a few minutes to let us know your thoughts via this anonymous 4 question survey:** [https://purdue.ca1.qualtrics.com/jfe/form/SV\\_2bq2CUWVQa3gPeS](https://purdue.ca1.qualtrics.com/jfe/form/SV_2bq2CUWVQa3gPeS)

**October 20, 2023.** **Biology Education Research Seminar Series.** The graduate students in biology education research at Purdue have organized a seminar series this fall and have a great slate of speakers lined up. The first speaker is Friday, October 20<sup>th</sup> at 11:30am ET in Zoom. Dr. Elli Theobald (U Washington) will be joining us virtually and her seminar is entitled: *Mind the gap: Active learning improves equity in STEM classrooms*. Zoom: <https://purdue-edu.zoom.us/j/91764754503>

**October 23, 2023.** The October 23<sup>rd</sup> Weekly will be dedicated to a mini workshop on the cultural aspects of mentoring led by our ABIDES program.

**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>

**BII Annual Conference - January 22<sup>nd</sup> - Hold the Date.** Details on the agenda will be shared when available. NSF is planning a hybrid one day meeting. Expecting most will be virtual, with a few of us possibly in person at NSF headquarters.

## 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

Congrats to Dr. Krishna Jayant being awarded by DoD for his project grant entitled “A Traveling Wave Basis for Coding Touch: Unraveling recurrent and translaminar circuit contributions to sensory-evoked traveling waves”. [Read the Story](#).

## 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 **Oct. 27<sup>th</sup>** to Brent ([laddb@purdue.edu](mailto:laddb@purdue.edu))