EMBRIO
Emergent Mechanisms in Biology of Robustness, Integration & Organization

"*EMBRIO NEWS*" : submit your Newsletter name ideas (laddb@purdue.edu). We'll vote on it in the next edition.

August 25, 2022

DIRECTORS NOTE

With this edition of the newsletter, we welcome you all back to Fall semester, and hope you have each had a positive finish to your summer season. The Institute is looking forward to building on momentum from our Annual Retreat as we resume Weekly Research Updates next Monday featuring Matt Thompson's doctoral research in the Umulis Lab. Assistant Director, Stephanie Gardner will be giving an overview of the Institute's Core Values along with feedback submitted from the membership (visit the Core Values slide link below to contribute). Diversity and inclusive belonging are an important thread woven throughout our Core Values. Collectively, we will continue to strengthen these in our growth as an Institute. We begin this newsletter with a statement drawn directly from our Core Values in a Commitment to Diversity and Inclusive Belonging. Your continued reflections, input, feedback, and ideas of how we can continue to improve in these areas is always welcomed. In closing, we are particularly proud of the research, learning, and progress made by the twenty undergraduate scholars who conducted exciting projects under the mentorship of EMBRIO faculty. We have high hopes for their continued involvement in the Institute. These students and their mentors are featured in the Institute Highlight.

David, Chris, Stephanie, Brent, and Carl

QUICK LINKS

Weekly EMBRIO Research & Education Meeting Zoom Link (Mondays at 3 – 4pm)

EMBRIO Core Values Feedback Google Slides

New EMBRIO Member Demographics Survey

COMMITMENT TO DIVERSITY & INCLUSIVE BELONGING

The EMBRIO Institute is committed to prioritizing diversity, equity, inclusion, social justice, and accessibility for ALL of its members. To support these priorities, we must ALL continuously reflect on how each aspect of EMBRIO's operation and agenda is designed and implemented so that it ensures ALL members are able to access and participate in Institute activities. By embracing the benefits of diversity together, we will drive scientific innovation and growth. The diversity of experiences and resources that EMBRIO members possess enriches our work together. To this end, we empower EMBRIO members to take the initiative within their own projects, education, and outreach activities to develop new leaders, spark innovation, and engender a sense of mutual responsibility and ownership of the Institute. As a result of honoring and supporting our collective diversity, each Institute member will be transformed and contribute to the transformation of others as a result of this collaborative endeavor.

INSTITUTE HIGHLIGHT

EMBRIO Undergraduate Research Experiences Summer Program

Our first summer as an institute was very productive in mentoring undergraduate students in research related to EMBRIO. Institute-wide, 20 students from 8 institutions engaged in mentored undergraduate research experiences, with 11 EMBRIO faculty serving as mentors.

The Institute organized a ten-week Undergraduate Research Experience on the Purdue campus during the period of May 23 – August 1, 2022. Fourteen students participated at Purdue representing six institutions (Purdue, Morehouse, UPRM, LSU, Miami, N.C. State). In addition to the EMBRIO summer program at Purdue, The Zartman Lab at Notre Dame organized an URE mentoring one UPRM student and one high school student, the Mendenhall Lab organized an academic and summer URE at Morehouse College mentoring two Morehouse students, and the Cabrera-Rios Lab at University of Puerto Rico – Mayaguez mentored two UPRM students. The table below provides a listing of the undergraduate students, faculty mentors, and their project titles.

Projects of participating students in EMBRIO Undergraduate Research Experience, Summer 2022.

Name	Home University	Faculty Mentor	Project Title
Christiana Whittey	Purdue	C. Staiger	Establishing a new pathosystem (Colletotrichum–Onion) for penetration-mediated resistance to fungal attack of plant cells.
Morgan Murff	Purdue	C. Staiger	Exploration into pre-penetration MAMPs and their effect on actin cytoskeleton rearrangement.
Kenneth Tre' Jahn Jones	North Carolina A&T	T. Kinzer-Ursem	Investigation of the Interactions of Neuronal Proteins in an Animal Model of Alzheimer's Disease
Sami Hallett	Purdue	J. Evans	Observing microfilament dynamics in live mouse oocytes with the actin probe SiR-Actin
Kioni Bush	Purdue	Q. Deng	Integration of Actin and Calcium in Embryonic Zebrafish Wounding Model

Ambrose Haskin	Morehouse	D. Chan	Measuring the Effect of Cerium Oxide Nanoparticles (CeO NPs) in 3D Printed Hydrogels
Chiana Barski	UPR-Mayaguez	C. Staiger	ARP 2/3 Complex Mediated Actin Filament Response in Presence of MAMP Treatment
Adriana Santos-Bague	UPR-Mayaguez	Q. Deng	Act1 Knockout effects on Interleukin 17 mediated neutrophil recruitment
Nathan French	Purdue	D. Umulis	Investigation and Quantification of the pSmad Profile in Early Embryonic Development of Bambia Mutant Zebrafish
Jaylin Trice	Louisiana State	J. Linnes	Blood Sample Preparation for HIV Diagnostics in a Smartphone-based Microfluidic Device
Ana Claure	Miami	J. Linnes	Optimizing a 37 degree Celsius isothermal nucleic acid amplification of human papilloma virus strain 16 (HPV 16) to detect individuals at high risk of cervical cancer
Eanna DeGuzman	Purdue	S. Gardner	Qualitative research methodologies to characterize EMBRIO activities, scientific explanations, and interactions.
Keni Jiang	Purdue	Q. Deng	ROS mediate relaxation and regrowth of zebrafish fin after amputation.
(Tim) Ting Hsuan Ku	Purdue	Q. Deng	Improving Under Agarose Gel Assay by 3D Printing for Investigating Neutrophil Migration
Jose Martinez Alvarad	UPR-Mayaguez	J. Zartman	Identification of new organ size regulators: Positive feedback between the G-protein Coupled Receptor Methuselah like-8 and Galphaq.
Anne Malott	High school student	J. Zartman	Functional Analysis of Piezo in Rasv12 Mediated Cancer Progression.
Jonathan Banks	Morehouse	J. Mendenhall	Evaluating the Mechanical Properties of 3d printed Hydrogels using varying water content levels.
Jordan Turner	Morehouse	J. Mendenhall	Development of Supramolecular Bioinks using Gene-Activated 3D Laden Hydrogels for Therapeutic Cartilage Tissue Regeneration.
Wilfrido Ramos	UPR-Mayaguez	M. Cabrera-Rios	The use of Jupyter Notebooks and Github in research.
Richardson Calderon	UPR-Mayaguez	M. Cabrera-Rios	The use of Jupyter Notebooks and Github in research.

CELEBRATING…

EMBRIO's *First* Baby!!

Many congratulations to Deva Chan (EMBRIO Faculty, and Assistant Professor of Biomedical Engineering at Purdue) and her family! Join us in welcoming **BRANDON**, EMBRIO's first baby. He arrived August 1 weighing in at 8 lbs. 8 oz and 22" long!!

MEMBER SPOTLIGHT: Matthew Thompson

Matt is a Ph.D. Candidate conducting research in the Umulis Lab in the Weldon School of Biomedical Engineering at Purdue University. He will be presenting at Monday's EMBRIO Weekly Research Update (Aug. 29) and defending his thesis September 14 at 11:30 in MJIS 200. Everyone can join his thesis defense talk via a Zoom option.

What's your hometown, State (and one thing you love, miss, remember or want to tell others about it)?
Fort Wayne, IN / I miss having family in town and the view overlooking a hill and field behind our house.

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

Originally drawn to engineering because Iron Man had recently hit theaters (only half joking), I found my way from a BS in Mechanical Engineering to an MS in Biomedical Engineering after taking a Principles of Tissue Engineering course in my early graduate studies and realizing I hadn't given biology a fair review from my experience with it in high school. Working with CRISPR-Cas9, I discovered that proteins really are the ultimate nanomachines. I then joined David's lab wanting to merge my still-new interests in biology with engineering and modeling tools I knew the lab excelled at and further hone my research abilities.

What are your hobbies?
Saturday morning bike rides with my family, YouTube fitness videos using a 5 and 2 year old as resistance, playing piano and listening to music when there's space in the day.

You find yourself alone on an elevator with the President of your university: s/he asks you to tell them about your research (15 seconds - go!):
"You know how you can hear the words I'm saying right now? The pattern of the cells in your inner ear that make that possible is created in large part by a complicated network of interacting signaling proteins during development. I'm working on figuring out how these signals communicate patterning or positional information to the cells to let them know where they are in the pattern and what mechanisms are in place that help shape the signals to be that way."

What's on the horizon for you (research, career, personal, whatever you want to share)?:
In essence, I plan to support the way interdisciplinary or cross-functional teams work together to accomplish big things in science and engineering. The opportunity to develop "sociotechnical" approaches that merge the advantages and needs of our human-ness with those of computers and lab equipment is large, and I look forward to contributing my skills and interests to that broad goal in academic-adjacent or industry roles. That is to say, something that merges ideas from data engineering, project management, and product management applied to scientific research.

What's your various URL/social media handles (prof. website, twitter, LinkedIn, blog, etc)
Matt's LinkedIn: https://www.linkedin.com/in/thompson-m-j/

UPCOMING DEADLINES, IMPORTANT DATES, & INFO

Investigator Annual Reporting Deadlines: We are on a tight timeline to report our Yr. 1 progress to NSF. The schedule for reporting:

- **Fri August 26 Final draft available to Investigators for comment**
- **Mon, August 29 Investigator comments on Final draft due to Manager(s)**
- Wed. Aug. 31 Completed Annual Report due to NSF

Weekly Research & Education Zoom Meetings Fall Semester, Monday's 3 – 4 pm.

Note the NEW Zoom link:
https://purdue-edu.zoom.us/j/96053485465?pwd=elVnY20wcm9kaFRtVUdPcmFHaGl1UT09&from=addon

- **August 29th: Matthew Thompson** (Umulis Lab) Research Talk

  Stephanie Gardner will provide an overview and feedback received from members on EMBRIO's nine Core Values.

- September 5, no meeting due to Labor Day holiday.

- September 12, Presenters: Shelly Tan & Chang Ding (Deng Lab), GuangJun Zhang Lab.

September 14: EMBRIO THESIS DEFENSE: Ph.D. student, Matthew Thompson with the Umulis Lab will defend his dissertation September 14 at 11:30 in MJIS 2001 on the Purdue Campus. Everyone can join via Zoom option .

New EMBRIO Listserv: To aid in managing Institute-wide communications, we've started an official listserv: embrio-list@ecn.purdue.edu . We'll use it to disseminate information like this newsletter and other announcements.

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/frd9275xc069gmgtbe3y1osoz1j7ssk7) let Brent know their names and email contacts (laddb@purdue.edu)

Member Demographics Survey: For new members that have joined EMBRIO since March, please complete the online survey (https://purdue.ca1.qualtrics.com/jfe/form/SV_5yIrHqxH1hHLl8a). This demographics information, although voluntary, greatly aids the Institute in tracking our progress on diversity initiatives. Faculty, please forward the demographics survey to any new trainees or interns that have recently joined the Institute.

Core Values Feedback. In addition to EMBRIO's Vision and Mission, our Strategic Plan includes nine Core Values that provide a guiding foundation for the culture and communities of practice we strive to build. The strategic plan is a living document, owned by all members of the Institute. Stephanie Gardner presented our shared Core Values statements at our recent annual retreat and invited all members to provide feedback and input. We invite you ALL to provide feedback and input based on your experience in the institute thus far. This will not be the last time we revisit these values to reflect and improve the institute, but **we request that you offer your input for this round by August 26**. You can do so anonymously within the Google Slides set (slides 6-15): **https://tinyurl.com/5h49w85n**

October 12-15, 2022. The **Biomedical Engineering Society (BMES) 2022 Annual Meeting** will be held in San Antonio, Texas. Registration is now open! You can save a lot of money by registering early – early bird registration ends **September 6.**

Nov. 9 – Nov. 12: The **Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS)** is a go-to conference for underrepresented groups in STEM fields.

Jan. 2 – 6, 2023: The BMES Cellular and Molecular Bioengineering Special Interest Group is seeking abstracts for the **BMES Conference (CMBE)** in Indian Wells, CA. DEADLINE for submissions is September 14.

****Submit your items for the next newsletter by Sept. 1 to Brent** (laddb@purdue.edu)**
t (laddb@purdue.edu)