



Emergent Mechanisms in Biology of
Robustness, Integration & Organization

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

Issue 14: March 1, 2023

DIRECTORS' NOTE

The month of March is [Women's History Month](#). See the quote below for a fascinating story of Nobel Prize winner, Dr. Barbara McClintock. Our **BII NSF Site Visit is taking place virtually this Friday, March 3, 10 am – 1pm**. We need especially EMBRIO investigators to attend. The site visit time participation link is in the upcoming events section of this issue.

The **spotlight this issue highlights Bakary Samasa**, Ph.D. student in the Mullins Lab at Penn. Bakary presented his research project "*Investigating the Molecular Mechanisms of Epiboly Morphogenesis in the Zebrafish Embryo*" this past Monday. The recording is available on the EMBRIO Box account > Weekly Update Meeting. Please welcome Bakary as he continues his doctoral research with the Institute.

In addition to the established journal clubs a **new journal club diving into Calcium Imaging Techniques** has launched and will be meeting each Monday, 11am. The culminating goal is to co-write a review paper about these techniques and methods. Links and instructions for participating are found in this issue.

In following up on the **Individual Development Plans** for each trainee as part of the Institute's ABIDES (Access, Belonging, Inclusion, Diversity, Equity, Support) program, Dr. Anjali Iyer-Pascuzzi, EMBRIO ABIDES sent an email with a survey link to each member asking you to complete this very brief update on your IDP. Please complete this by March 5.

An ongoing reminder for any who have not yet participated in the **Institute evaluation interview** with Soumi Mukherjee, please schedule this via the new When to Meet

Poll <https://www.when2meet.com/?18327719-shNWM>

We want to hear about your news and announcements. Send them to Brent (laddb@purdue.edu) by March 10th for inclusion in the next issue of *Emergence*.

David, Chris, Stephanie, Anjali, and Brent

Notable Quotes

“If you know you are on the right track, if you have this inner knowledge, then nobody can turn you off...no matter what they say.” Geneticist, Dr. Barbara McClintock (1902 – 1992). Explore McClintock’s journey into science and the story of her work in cytogenetics that gained her the Nobel Prize in Physiology or Medicine in 1983 at the [Nobel Prize Women Who Changed Science page](#).

QUICK LINKS

BII NSF Virtual Site Visit (3/3 10 am – 1pm): [Zoom link](#)

Journal Club – Calcium Imaging Techniques: [papers to be discussed](#)

[ABIDES Open Office Mondays 2:30 - 3 pm Zoom link](#)

ABIDES Monthly Informal Trainee Lunch Group with DEI Director in DLR 228c, Purdue campus. Noon – 1pm, March 9. [Zoom link for those off campus](#).

[Grants Writing Series](#) Box folder

[Schedule Your One-on-One Interview with Soumi](#)

[Weekly Meeting Recordings](#)

MEMBERSHIP SPOTLIGHT: Bakary Samasa



Bakary Samasa

Bakary Samasa, 2nd Year Graduate Student, Cell and Developmental Biology, Perelman School of Medicine, University of Pennsylvania, Mary Mullins Laboratory. Project: “Investigating the Molecular Mechanisms of Epiboly Morphogenesis in the Zebrafish Embryo”

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

I am from Philadelphia, PA and the one thing I love about this city is that my friends and family are here so I always feel supported.

What are your hobbies?

I enjoy spending time with loved ones. As well as playing basketball or having philosophical debates on existence.

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

The ability to ask questions that interest me as well as the freedom to answer them how I see fit. I was also inspired by my mentors, Mary Mullins, Brant Weinstein, Marina Venero Galanternik, Dan Castranova, and John Henson who nurtured my love of science as well as encouraging me to grow both personally and scientifically.

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

I am interested in elucidating the mechanisms of epiboly specifically relating to how the cytoskeleton and calcium interplay to drive this process. I will be using various imaging modalities as well as mutants to determine the mechanisms of the morphogenetic process.

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!):

I am interested in how the body is formed. Especially relating to the mechanical and chemical signals that tell the cells where to go and where to end up using microscopy and zebrafish as a model organism. With this knowledge we can understand the basic mechanisms in developmental contexts but also in injury.

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

I am excited to complete my preliminary examination this spring and getting to spend more time in lab.

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

<https://twitter.com/SamasaBakary>

JOURNAL CLUBS

NEW CLUB: CALCIUM IMAGING TECHNIQUES

Due to the need within our EMBRIO community to process and analyze Ca²⁺ Images, Director Umulis has proposed to discuss papers regarding methods and tools for analyzing calcium imaging as part of a new journal club. **The goal, beyond integrating these techniques, is to write a review paper.**

Norma Perez (nperezro@purdue.edu), EMBRIO Postdoc with the Buganza-Tepole and Umulis Labs, is leading the effort to organize this journal club, please contact her about joining the club. *Online participation link TBD.*

The club is currently discussing the following papers:

https://docs.google.com/document/d/1uESi45Zv_kGL369NW8sPW6oGByOAXme7-vr1XKBM18U/edit?usp=sharing

Students and postdocs, please select a paper you want to discuss and let Norma know your selection. She will add your name to this Google Sheet in order that the community knows the rotation.

<https://docs.google.com/spreadsheets/d/1RQOTEIncii3HLRaUK38sP8EpOmAeuAc5jP6wR4X7Fg8/edit?usp=sharing>

The presenter will prepare a presentation of the paper and lead the discussion during the meeting for about 1 hour.

Since the goal is to write a review paper, Norma is asking for each presenter to write a short 2-3 sentence summary, and I will add your text in the summary column of the spreadsheet.

On Google Sheets, you will also find a worksheet tab called “Tool Attribute Table”, the aim is to fill out that table through the discussion as a basis for the writing process. We can discuss the structure and the content of the Table in our meetings.

If you want to add an additional paper to the list, please let Norma know.

ONGOING CLUB: Multimodal Functions of Calcium in Tuning and Regulating Cytoskeleton Networks

Please contact Dr. Linlin Li (li2212@purdue.edu) for information. The club is currently entering 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/1Cpg77ytioWiIuRmiDMCcAiAd4jNNX_J7s64RQk8xOU/edit?usp=sharing

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

DEI in EMBRIO has transitioned to ABIDES (Access, Belonging, Inclusion, Diversity, Equity, Support). Dr. Anjali Iyer-Pascuzzi, EMBRIO ABIDES Director and Associate Professor at Purdue, is leading activities for Institute members. Planned ABIDES activities for this semester (Zoom links are also shared in the [ABIDES folder in the EMBRIO BOX](#) account):

- **Individual Development Plans (IDPs) completed by Feb. 24.** You can use one of your own or one of the templates in the ABIDES folder in BOX Students: If you already filled out an IDP for your department you can use that one and do not need to do another. Please upload only the 'blank' template you chose to develop or use to the ABIDES folder, NOT your actual IDP! This is because these are private between you and your mentor, and not everyone may feel comfortable sharing the completed IDP with additional people. This way I have an idea of what types of IDPs people in the Institute are using.
- IDP survey. Look for a Qualtrics email from Anjali. Reminders will be sent. **Please complete by March 5.**
- Weekly open office 'hour' 2:30 – 3 pm (Eastern) each Monday before research update, Zoom link here: <https://purdue-edu.zoom.us/j/91942543564>
- Trainee lunch hour meeting **March 9, 12 – 1 pm** (Eastern) in DLR 228c and by Zoom:

<https://purdue-edu.zoom.us/j/95281263014>

March 8th a session by NIH titled “**The Mental Health and Well-being of Your Trainees**” takes place online Noon – 2:15: [Learn More](#)

EMBRIO TRAINEE PROFESSIONAL DEVELOPMENT *GRANTS* SERIES

These sessions were held once a month with materials and instructions for developing aims pages accessible on EMBRIO Institute Box > Trainee Professional Development > [Grants Writing Series](#)

November 28th : The Grants Process and Federal Granting Agencies – Faculty Panel ([recording](#))

January 23rd : De-Mystifying the Craft of Creating an Aims Page ([recording](#))

February 20th : Students present draft Aims page for Peer-Feedback ([recording](#))

March 27th: TBD

EMBRIO STUDENT LEADERSHIP COUNCIL

Calling postdocs and undergrads to help lead student efforts through the newly formed EMBRIO Student Leadership Council. The SLC is in the early stages with graduate trainees organizing the council. The SLC is recruiting postdocs and undergrads to join the council leadership. Please reach out to Feyisayo Akande fakande@purdue.edu and David Gazzo dgazzo@nd.edu.

The Council presents the officers of the SLC:

President: **Feyisayo Akande**

Vice President: **Jazzmin Owens**

Treasurer: **Saumya Mehta**

Secretary: **Peter Brumm**

Executive Advisory Char: **Everyone** will participate

Marketing & Public Relations Chair: **Peter Brumm & Liz Teren** (Jazzmin Owens will assist)

Student Advisory & Outreach Chair: **Liz Teran**

Professional Development Chair: **David Gazzo**

Undergraduate Representative Chair: **Jonathan Banks**

UPCOMING DEADLINES, IMPORTANT DATES, & INFO

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

Spring Semester Zoom link:

<https://purdue-edu.zoom.us/j/99819751005?pwd=UVlvWVpxRDB0cDVXbmxBU1NUTEZGZz09&from=addon>

- January 9 – Krishna Jayant, Asst. Prof., BME, Purdue
- January 16 – Martin Luther King, Jr. Day – No Meeting, please volunteer locally
- January 23 – Trainee Professional Development, Grants Series Session #2
- January 30 – Anjali Iyer-Pascuzzi, Assoc. Prof., BPP, Purdue, DEI Director, EMBRIO
- February 6 – Thrust & Site Leads Update Meeting
- February 13 – Priyanka Baloni, Asst. Prof, HHS, Purdue
- February 20 – Trainee Professional Development, Grants Series Session #3
- February 27 – Bakary Samasa, Mary Mullins Lab
- March 6 – Thrust & Site Leads Update Meeting – NSF site visit debrief, next steps
- March 13 – Spring break, no meeting
- March 20 – Open for Discussion
- March 27 – TBD (Trainee Professional Development)
- April 3 – Thrust & Site Leads Update Meeting
- April 10 – TBD
- April 17 – Leopold Green, Asst. Prof., Biomedical Engineering, Purdue
- April 24 – TBD
- May 1 – Thrust & Site Leads Update Meeting
- May 8 – Javier Munoz, Brubaker Lab

Nov. 9, 2022 – March 8, 2023. NIH [RAISING A RESILIENT SCIENTIST](#) series.

March 2, 2023. BME special seminar of Prof. Makito Miyazaki (from Kyoto University in Japan) at 9:15-10:15am in MJIS 200 or zoom: <https://purdue-edu.zoom.us/j/93793770670>
Reconstitution of Actin Cytoskeletal Dynamics and Functions. He is an expert for creating a reconstituted cell-like system with the actin cytoskeleton encapsulated by a lipid vesicle.

March 3, 2023. NSF – EMBRIO Virtual Site Visit, 10 am – 1pm ET. [Link to participate](#). Planned presenters for EMBRIO are David Umulis, Chris Staiger, and Stephanie Gardner. However, we need all thrust leaders specially to participate on the call. Calendar invite was sent several weeks ago.

April 5, 2023. [Frontiers in Biophysics Seminar Series](#), 1:30 p.m. in MJIS 1001. Joe Howard, the Eugene Higgins Professor of Molecular Biophysics and Biochemistry, Department of Molecular Biophysics and Biochemistry, Yale University, will present “Mechanical Stability of Microtubules.”

July 10-12, 2023. EMBRIO Trainees Workshop, Notre Dame University. Details forthcoming.

July 13-14, 2023. EMBRIO All-Hands Annual Meeting, Purdue University. More information forthcoming.

INSTITUTE EVALUATION: SIGN UP FOR YOUR ONE-ON-ONE INTERVIEW (hint: it’s mandatory)

If you are a member of the EMBRIO institute currently doing a research project, we would like to invite you for participating in this study. Participation in the evaluation process is MANDATORY for all the members of the institute.

As a part of the evaluation process, you will take part in an online session (via Zoom), which includes an interview and a brief survey, and the entire process should be completed in less than an hour. Interviews will be conducted annually for the total duration of your participation in the institute and the session would not exceed an hour and would be completed in a day.

Please fill in all the times you may be available for our interviews using the link below with either your name or email address. This information is requested so that we may contact you to set up an online session, but we will use a randomly generated 4-digit code in place of your name to identify all your information for the data collection and analysis.

<https://www.when2meet.com/?18327719-shNWM>

Your participation will not affect any aspect of your association with the EMBRIO institute. If you have any doubts regarding the evaluation process, please reach out to Soumi at mukher42@purdue.edu.”

With Regards
Soumi

NIH Raising a Resilient Scientist Series

The NIH OITE is pleased to offer the [RAISING A RESILIENT SCIENTIST](#) series for faculty, staff scientists, and administrators who mentor students and postdoctoral fellows in the biomedical, behavioral, and social sciences. The goal of the Raising a Resilient Scientist series is to promote the mental health and well-being of the academic research community by supporting faculty and administrators to develop self-management, relationship-management, and mentoring skills.

For questions regarding this series, please contact the OITE at OITE@mail.nih.gov. Please include "PI Series" in the subject line.

All webinars will be recorded and are available 24 - 48 hours after the session using the links posted below.

Raising a Resilient Scientists Units	Workshop Date	Registration
Communication Skills to Build Trainee Resilience	Nov 9, 2022 12:00-2:15 pm ET	Webinar: https://nih.zoomgov.com/meeting/register/vJlsdeyhrjwsG3qSl89jFIF9zUdzoYlz4Vw Recording: https://nih.zoomgov.com/rec/share/MR7KLeoKyuMY8r7gr5bxhR9jY-3kdebR2-PUW6e29F6YKbnf3MILLpJsnOQWcsViZSS3NyL55v9wPaA
Promoting Trainee Resilience	Dec 14, 2022 12:00-2:15 pm ET	https://nih.zoomgov.com/meeting/register/vJlsc-uvpzovGbw2kGLBSbihRcERfN2raTc Recording: https://nih.zoomgov.com/rec/play/bm1NfesB3y-AoFUe6zOvn-ALx1jzYlb7mOIXDdShsDDZyX0JG9WHDuoPOPdGknfEg-81n7OhvSwWpuNf.eYt3v1UYKs9Hln7E
Building a Welcoming and Inclusive Research Group	Jan 18, 2023 12:00-2:15 pm ET	https://nih.zoomgov.com/meeting/register/vJlscOurqjoGtH9Y_zDJPVHhg2Nm6zWNb0 Recording: https://nih.zoomgov.com/rec/play/CPD1_MTZUeVWLhGZQwlwbdK2Zc42MQC3UlaBEtfnLWMtA1ixYdB9SOWE r4GBmYmf5PxNnineGV10ZRhK.1LNzk4k5gzMkzxFG
Difficult Conversations, Conflict, and Feedback	Feb 8, 2023 12:00-2:15 pm ET	https://nih.zoomgov.com/meeting/register/vJlsc-CgrTsiHfcOa91MnLLQ-REQmdOQ2I
The Mental Health and Well-being of Your Trainees	Mar 8, 2023 12:00-2:15 pm ET	https://nih.zoomgov.com/meeting/register/vJlscuCpqT4pEzjHEmDI2E604ncYzhOrhm4

There is no charge for participation, but advanced registration is required. For more information, and to register, please visit their [webpage](#). Participation in the entire series is recommended but is not required.

Hot Off the Press: New EMBRIO Journal and Conference Papers

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

REMINDER: EMBRIO Acknowledgement for Scholarly Papers.

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.”**

Conference Presentations:

Let us know about your conference presentations.

Awards

Let us know about your awards.

Open Positions

Two Open-Rank Professor Positions in Technology and Research Related to Next-Generation Biomedical Digital Twins

The Department of Intelligent Systems Engineering at Indiana University is pleased to announce a search to fill Two Open-Rank Professor Positions in Technology and Research Related to Next-Generation Biomedical Digital Twins. Appointments can be at Full, Associate or Assistant Professor level and two-person cluster hires are possible. Appointments can begin as early as August 1, 2023. This search is part of a broad collaborative initiative to create key hardware and software components of next-generation digital twins for research, bioengineering and clinical application.

To learn more about Luddy School, ISE, and to apply online, please visit <https://indiana.peopleadmin.com/postings/16811>

For more details see attached full announcement.

Questions, nominations, and confidential inquiries may be sent to Prof. James A. Glazier (jaglazier@gmail.com)

Postdoctoral Fellow Position in Interdisciplinary Biomedical Research and Data Science, Purdue University

A full-time postdoctoral fellow position is available immediately for interdisciplinary research in computational systems biology and collaborative data science at Purdue University. The

postdoctoral position is associated with EMBRIO (Emergent Mechanisms in Biology of Robustness, Integration, and Organization), an NSF Biology Integration Institute with six university partners. The postdoctoral fellow will be broadly involved in the EMBRIO Institute, with efforts engaged in computational systems modeling and simulation research, as well as building expertise, guidance, and collaboration support and research in data management and data analysis for EMBRIO teams. The postdoctoral fellow will conduct research under the guidance of Dr. Elsje Pienaar (<https://engineering.purdue.edu/PienaarLab>) and be co-advised by Dr. Adrian Buganza Tepole (<https://engineering.purdue.edu/tepolelab/>).

As part of the work with the Pienaar lab the fellow would build and calibrate computational models of Calcium signaling in multicellular environments and its diverse downstream effects. Together with the Tepole lab the fellow would work to leverage machine learning (ML) tools to speed up and automate model evaluation, and to complement closed-form models with multi-modality ML metamodels for improved accuracy. The work is highly interdisciplinary and highly integrative across multiple systems. The fellow will work closely with experimental experts in zebrafish, plant and tissue culture biology within the EMBRIO Institute to build and parameterize the models. The fellow will also have opportunities to work closely with other computational faculty, staff and students on innovating new ways to integrate and analyze models and data across biological scales and systems.

As these specific projects progress, the postdoctoral fellow will have the opportunity to collaborate with investigators and interdisciplinary teams to research and deliver secure systems of data collection, storage, sharing, and analysis to produce new and actionable knowledge. This work will research and provide regular guidance and training in data science best practices and serve as a point of contact for all things data related. The postdoctoral fellow will have the opportunity to co-write proposals and to develop research components around the data-rich interdisciplinary modeling and simulation environment of EMBRIO.

A Ph.D. degree in Data Science, Computer Science, Biomedical Engineering, Chemical Engineering, Mechanical Engineering, Mathematics, Physics or related fields is required. Previous experience in computational modeling, systems biology, stochastic modeling, numerical methods, and associated statistical analysis, data science, or research data management is desired. Successful applicants will be detail oriented, eager to learn new methods, and enthusiastic about computationally rigorous modeling, collaborating across disciplines, working with experimental biologists and chemists, and advancing and supporting the research data realm of EMBRIO Institute. Salary to be negotiated.

To apply for this position, please submit to Dr. Pienaar (epienaar@purdue.edu) and Dr. Buganza Tepole (abuganza@purdue.edu): (1) your CV, (2) a cover letter explaining your background, interest and qualifications for the position, and (3) contact information for three references, including your relationship to the reference, their phone number, email address, and mailing address. Please contact Dr. Pienaar (epienaar@purdue.edu) for formal inquiries.

Postdoctoral Fellow Position in Interdisciplinary Biochemical Cancer Research, University of Notre Dame

A full-time postdoctoral fellow position is available immediately for Multidisciplinary Cancer Research at the University of Notre Dame, affiliated with the Harper Cancer Research Institute, the Notre Dame Warren Drug Delivery Center and Notre Dame Institute for Precision Health. The perspective candidate will conduct an interdisciplinary research on projects studying the basic molecular mechanisms of multiple birth defects, cancer progression and neurodegeneration and developing novel therapies to combat them. The postdoctoral fellow will receive crossdisciplinary training in biochemistry, cell biology, synthetic organic chemistry, and drug discovery utilizing a broad range of biochemical assays related to phenotypic screening and protein-protein interactions. The postdoctoral fellow will conduct research under the guidance of a mentoring team, including Dr. Jeremiah Zartman (<http://sites.nd.edu/zartmanlab/>) and Dr. Brandon Ashfeld (<https://ashfeldlab.nd.edu/>).

A Ph.D. or M.D. degree in cell or molecular biology, genetics, biochemistry, chemistry or a related discipline, is required. Previous experience in genetics, screening technologies and associated statistical analysis, synthetic chemistry, imaging or mouse modeling is desired. Successful applicants will be detail oriented, eager to learn new techniques, and enthusiastic about biology, exploring the interface between chemistry and biology, and working in an academic lab environment. Salary is commensurate with experience.

To apply this position, please submit: (1) your CV, (2) a cover letter explaining your background, interest and qualifications for the position, and (3) contact information for three references, including your relationship to the reference, their phone number, email address, and mailing address. Please contact Dr. Jeremiah Zartman (jzartman@nd.edu) or Dr. Brandon Ashfeld (bashfeld@nd.edu) for formal inquiries.

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/frd9275xc069gmgmtbe3y1oso21j7ssk7>), or they have graduated, let Brent know their names and email contacts (laddb@purdue.edu)

Submit your items for the next newsletter by March 10th to Brent
(laddb@purdue.edu)