



MEDICAL SCHOOL
UNIVERSITY OF MICHIGAN

CELL & DEVELOPMENTAL BIOLOGY

DEPARTMENT NEWSLETTER

Fall 2018

This image, "Guardian Angels" from the Giger laboratory, is part of the 2018 BioArtography collection. Depicted are two different cell types found in the central nervous system of mice and humans. Astrocytes (cyan) are multifunctional glial cells that metabolically and physically support the neurons (magenta). Astrocytes are fewer in number than neurons; however, they give neurons the gentle touch they need to survive, grow, and maintain activity. When the central nervous system is injured, astrocytes form barriers called glial scars, which mediate an inflammatory reaction that alleviates the damage and aids in the clean-up of debris. In summary, astrocytes are the guardian angels of neurons, fighting head-on against insults and diseases. WWW.BIOARTOGRAPHY.COM

Interview with the Chair



Pierre A. Coulombe, Ph.D.
G. Carl Huber Professor and Chair of Cell & Developmental Biology

WHAT HAS BEEN SPECIAL TO YOU IN YOUR FIRST YEAR AS CHAIR OF THE DEPARTMENT?

We conducted a faculty search on a national scale and it proved to be a highly rewarding and successful endeavor. We recruited two immensely talented and promising individuals at the Assistant Professor level – Swathi Yadlapalli and Idse Heemskerk. Both have been selected for the very prestigious Biological Sciences Scholar Program at the Medical School and University. Swathi and Idse are now here with us, busy setting up their laboratories and programs.

Otherwise, we have been very pro-active about addressing various aspects of CDB's mission. While many projects would deserve special recognition, I'd like to single out the reform that we have put in place to cover the tuition costs associated with PhD education, along with the investments that we are making towards continuously improving the training experience offered by CDB to both PhD graduate students and postdoctoral fellows.

WHAT ARE YOU LOOKING FORWARD TO IN THE YEAR AHEAD AND WHAT MIGHT BE THE BIGGEST CHALLENGE TO OVERCOME FOR CDB?

Space!! Working closely with administrator Karen Lang, associate chair Dr. Kristen Verhey and staffers Lori Mirabitur and Deontae Hooks, we have initiated a long-haul effort to optimize the usage of laboratory and administrative space in the department. There are many areas of need along these lines. We acquired additional space for the department in the BSRB building in the past year, and plan to continue working with the medical school leadership to successfully attend to our growing and changing needs.

WHAT IS THE MOST FUN PART OF YOUR JOB?

Two things, which are interdependent and integrated. One is to hear about terrific science on a regular basis. The other is to interact with the PhD students and postdoctoral fellows on a daily basis, whether they are in my own laboratory or affiliated with others in the department. CDB is fertile ground for both and, in the end, it makes being faculty in this department a very special opportunity!

FACULTY HONORS & AWARDS



Ben Allen
2018 EBS Teaching Award in
Cell & Developmental Biology



Maria Castro
2018 Dean's Award in Basic
Science Research



Deb Gumucio
2018 AGA (American
Gastroenterological Association)
Institute Council Section Research
Mentor Awardee in Growth,
Development & Child Health



Ajit Joglekar
2018 Collaborative Research
Training Grant from the Burroughs-
Wellcome Fund

NEW FACULTY

The Department of Cell & Developmental Biology would like to extend a warm welcome to our newest faculty members!

Idse Heemskerck

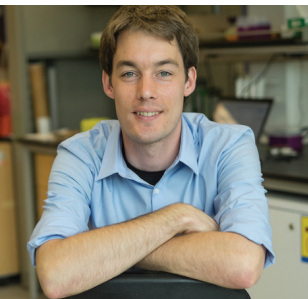
Assistant Professor

RESEARCH FOCUS:

Stem cells, mammalian development, signaling & patterning dynamics, morphogenesis, mathematical modeling, biological physics

RESEARCH STATEMENT:

What are the mechanisms through which stem cells give rise to self-organized embryonic structures and organs? How is the information required to form these structures encoded in highly dynamic signals? What is the role of the physical forces and geometric constraints in reproducible tissue patterning and morphogenesis?



Q&A:

Mentor or leader who inspires you?

My Ph.D. advisor Joe Polchinski is an inspiration to me. He was one of the most brilliant scientists I have ever met, but also a great person who always kept perspective.

Favorite app on your phone?

Yelp, because when I'm not thinking about science I am usually thinking about my next meal.

First job?

My first summer job as a teenager was folding shirts in a business that embroidered logos on clothing.

Favorite place to relax or go on vacation?

I like going on vacation in the Netherlands, which is where I grew up, to spend time with family and friends.

If someone were to play you in a movie, who would you want it to be?

Benedict Cumberbatch, "because he is awkward in the same way as you, or maybe that is just his Sherlock Homes character" (says my wife).

Favorite book?

Not sure about all time favorites. I like Murakami a lot, A Wild Sheep Chase probably left the deepest impression.

Swathi Yadlapalli

Assistant Professor

RESEARCH FOCUS:

Circadian biology, sensory neuroscience, thermoreceptors, metabolism

RESEARCH STATEMENT:

Our research focuses on understanding the neural and molecular basis of circadian rhythms. Circadian rhythms are 24-hour oscillations in behavior and physiology that are generated by endogenous clocks found in almost all living organisms. The disruption of clocks has been linked to many human pathologies including diabetes, cancer and neurodegenerative diseases. Our goal is to understand the fundamental processes of circadian systems at different organizational levels, from molecules and cells and large-scale networks to organismal physiology and behavior. We use the *Drosophila* circadian system because it has a clock system that is highly conserved from flies to humans, superb genetic and neural activity monitoring tools, along with robust behavioral paradigms. We expect our studies to provide deeper insights into human circadian clocks and aid in the development of novel therapeutic strategies to target clock machinery and treat diseases.

Q&A:

Mentor or leader who inspires you?

Many great scientists. I am inspired by their personal stories, their courage, and their determination. Can't pick one.

Favorite app on your phone?

Not much of a phone person. If I have to choose, whatsapp.

First job?

TAing in graduate school

Favorite place to relax or go on vacation?

I love traveling to new places. I don't have one favorite place, but South East Asia, India and Latin America are my top choices.

If someone were to play you in a movie, who would you want it to be?

Maybe Mindy Kaling.

Favorite book?

I loved reading Jane Austen books while growing up.



Jillian Pearring

2018 Research to Prevent Blindness Career Development Award by Research to Prevent Blindness (RPB)



Jason Spence

2018 Dean's Award in Basic Science Research



Sue O'Shea

2018 NAMI (National Alliance on Mental Illness) Scientific Research Award



Kristen Verhey

UROP Outstanding Research Mentor Award

POSTDOCTORAL AWARDS



Chelsey Spriggs

Tsai Lab
MMMP (Molecular Mechanisms of Microbial Pathogenesis) Fellowship



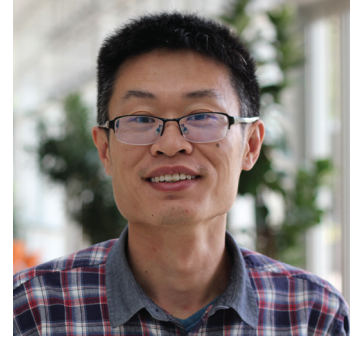
Nina Steele

Allen Lab
MICHR Postdoctoral Translational Scholars Program
Cancer Biology Training Grant



Sha Wang

Gumucio Lab
2018 Midwest Society for Developmental Biology Conference Travel Award
Bradley M. Patten Award for Excellence in Postdoctoral Research



Lei Yu

Engel Lab
Cooley's Anemia Foundation Fellowship

GRADUATE STUDENT AWARDS



Emily Bowers

Lucas-Alcaraz Lab
Defended her Ph.D. Thesis



Henry Kuang

Lin Lab
NIH Ruth L. Kirschstein Predoctoral NRSA Fellowship



Anna Shirazyan

Allen Lab
Hearing, Balance and Chemical Senses Training Grant



Song Chen

Parent Lab
CellulART Image Competition First Place Award



Jing-Ping Lin

Giger Lab
Defended her Ph.D. Thesis



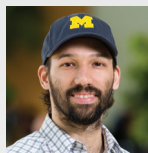
Jianrui Song

Mortensen Lab
Defended her Ph.D. Thesis



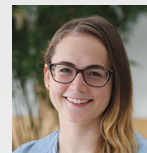
Corey Cunningham

Tsai Lab
2017-2018 Endowment for the Development of Graduate Education (EDGE) award
Sarah Winans Newman Graduate Student Teaching Award



Jorge Martinez-Marquez

Duncan Lab
2nd Place Graduate Student Poster Award 2017 American Society for Cell Biology Minorities Affairs Committee
Defended his Ph.D. Thesis



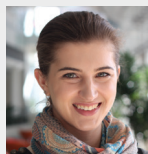
Bridget Waas

Allen Lab
CBTP Training Grant
Shelley J. Almburg Graduate Student Service Award



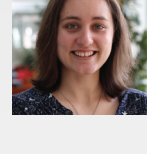
Martha Echevarria Andino

Allen Lab
Selected Short Talk, Craniofacial Morphogenesis Gordon Research Seminar
Best Poster Award, Craniofacial Morphogenesis Gordon Research Conference
Center for Organogenesis Training Grant



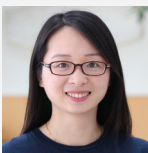
Kyriel Pineault

Wellik Lab
Defended her Ph.D. Thesis
Bradley M. Patten Award for Excellence in Graduate Research



Abigail Ziemann

Coulombe Lab
Defended her Ph.D. Thesis



Yajuan Guo

Coulombe Lab
Defended her Ph.D. Thesis



Justine Pinskey

Allen Lab
Defended her Ph.D. Thesis
Selected Short Talk, Education Minisymposium, 2017 ASCB Meeting
Selected Short Talk, Cell-Cell Signaling Minisymposium, 2017 ASCB Meeting



Takuya Kaneko

Ye Lab
Defended his Ph.D. Thesis



Kristin Schimert

Verhey Lab
Defended her Ph.D. Thesis

STAFF AWARDS



Einor Jacobsen

Making a Difference Award



Jeff Williams

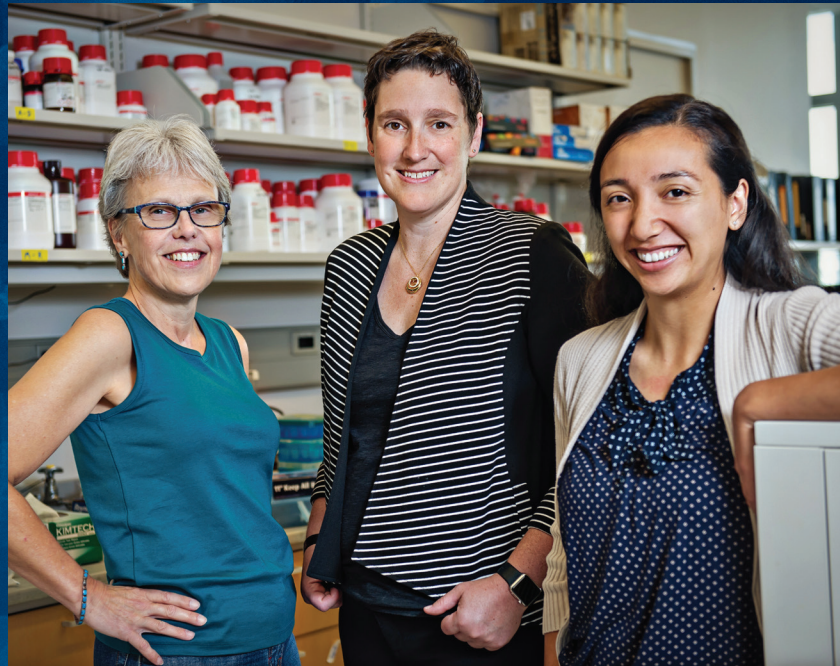
Making a Difference Award

Cryo-EM: The Resolution Revolution

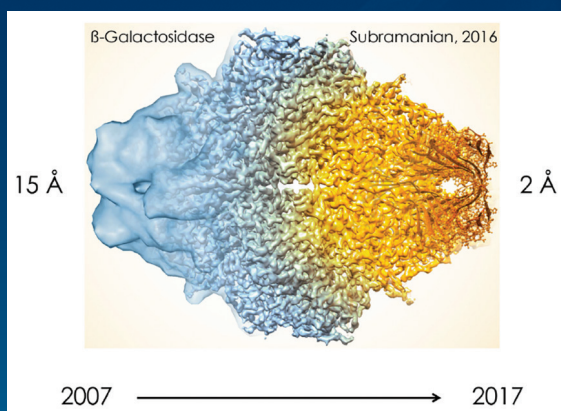
What is the “resolution revolution” you ask? Recent technological developments in microscopes, cameras, and computational approaches have led to a revolution in the field of single-particle cryo-electron microscopy (cryo-EM). Researchers using cryo-EM are now able to tackle problems at scales beyond what previously popular structural methods, such as crystallography and NMR, are able to obtain. It is now possible, using cryo-EM, to determine 3D structures under 3Å resolution, including those of membrane proteins and protein complexes with either low or no symmetry.

The U-M Life Sciences Institute (LSI) houses and maintains a state-of-the-art cryo-EM facility whose mission is to drive scientific discovery by determining the 3D structures of biological samples. Many groups across campus are interested in using this sophisticated technique to determine how the shape of a molecule at the atomic level relates to its cellular function in order to provide insight into molecular mechanisms that impact human health and disease.

Cryo-EM at the University of Michigan just got a huge boost. A proposal titled “From Cells to Atoms – The future of Cryo-Electron Microscopy at the University of Michigan”



LEFT TO RIGHT: **Ulla Lilienthal**, Research Lab Specialist, **Melanie Ohi, Ph.D.**, Associate Professor, **Amanda Erwin**, Graduate Student



In the last 10 years, cryo-EM has progressed from “blobs” (15Å) to atomic (2Å) resolution.

was selected for funding by the university’s Biosciences Initiative.

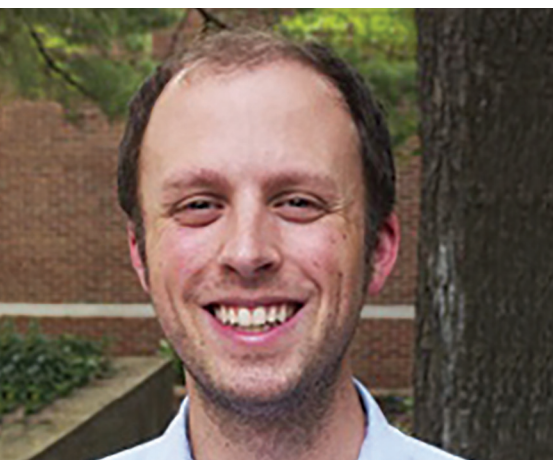
The cryo-EM proposal was developed by Dr. Melanie Ohi, a primary faculty in CDB, together with Drs. Janet Smith and Mike Cianfrocco in the Department of Biological Chemistry and the LSI. The Biosciences Initiative funding will be used to: (1) invest in new cutting-edge cryo-EM technologies to visualize molecular machines inside intact cells (called cryo-electron tomography), (2) streamline a cryo-EM “sample-to-structure” pipeline, and (3) establish a leading international site for education of new cryo-EM practitioners.

MORE INFORMATION ABOUT THESE CAPABILITIES AND EFFORTS CAN BE FOUND AT:

lsi.umich.edu/science/centers-technologies/cryo-electron-microscopy/partner-us

Alumni Update

We recently had an opportunity to catch up with two of our alumni, Christina Swanson & Stephen Norris



WHAT IS YOUR CURRENT JOB/TITLE?

Christina: Assistant Professor of Biology at Arcadia University.

Stephen: Scientist, Oncology at Calico Labs

WHAT DO YOU DO ON A TYPICAL DAY?

Christina: On a typical day, I will teach for several hours (either lectures or labs, depending on the day). Most days I have at least one research student in my lab, so when I'm done with class I'll often stop by lab and check on my research students to make sure they know what they need to do. Once I'm back in my office, I will work on course prep, grading, or various other

busywork like writing letters of recommendation for students or committee work. Most days I have additional student meetings, for academic advising, career advising, or help with coursework, and occasionally a committee meeting too. If I have any extra time I try to get some work done on one of the papers I'm writing.

Stephen: Overall, my day looks pretty similar to a typical day during my postdoc. I would say the breakdown is something like this: 60% doing experiments or bench work, 20% coding or data analysis, and 20% meetings. I'm still pretty new at Calico, so I'm spending a bit more time than normal reading and thinking about project direction.

WHAT DO YOU LIKE MOST/LEAST ABOUT YOUR JOB?

Christina: I love my job! I love teaching – it's challenging and fun to figure out how to most effectively present complex concepts to my students, and incredibly rewarding to watch my students make progress or become passionate about a new topic we've discussed in class. I also love that I still get to do research – I'm able to build great relationships with my research students, and we get to carry on with smaller scale projects that don't require constant grant-writing for funding. Perhaps most surprising is how much I enjoy advising! At small schools like Arcadia, student advising is an important (and time-consuming) part of our jobs – but I really appreciate how advising allows me to follow a student from their freshman year all the way to graduation, watch them grow and mature, and hopefully play a part in their future success. Finally, I am grateful for the flexibility of my job – some days I don't teach at all, and on other days I can record lectures if necessary (for example, if I'm at a conference or home with a sick kid). That flexibility is invaluable when you have small kids, as I do. I think the most challenging thing about my job, however, is trying to juggle the many different responsibilities of a faculty member at a small liberal arts school. I definitely have to take my work home with me pretty often.

Stephen: Like most: I never have to write another NIH grant, but I still have the privilege of doing creative science for a company that values discovery. It's true that you still have to "sell" your work, but this usually comes in the form of pitching a project proposal to a scientific review committee that is part of the company. Because everyone is on the same team, it feels a lot less arbitrary than an NIH study section.

Like least: I'm given plenty of room to operate within my project and the leadership here values our input, but the big-picture decisions are made by people above my pay grade. I actually find this hierarchy works really well, but it's definitely not for every personality.

WHAT DO YOU WISH YOU HAD KNOWN WHEN YOU WERE A CDB GRAD STUDENT?

Christina: Overall, I think CDB does a really good job of preparing grad students – in particular, the grant-writing experience I got in CDB courses and the presentation experience I got during lab meetings and in the CDB student seminar were incredibly useful during job interviews and throughout my postdoc. I do wish I had known more about the odds of securing a faculty position in the future, and about alternate career paths. I am very fortunate to have ended up with exactly the type of job I always wanted, but if that hadn't worked out, I'm still not sure what my plan B would have been!

Stephen: As a grad student, I always thought the choice was binary: either (1) be an industry scientist and do boring, mindless work or (2) run an academic lab and do thrilling, exciting work. Once I started actually talking to people in industry, however, I found out this wasn't true. If you're completely obsessed with a specific field of biology and want to continue studying it, academia is probably the best fit for you, and it's a great career. On the other hand, as an industry scientist, you might be part of a team that develops a cure for sick patients – how cool is that? If your goal is to do something more applied, or if you're just not sure, talk to some people in industry – you might like what you hear. Honestly, never pass up an opportunity to talk to someone about what they do — a conversation is almost always going to be more valuable for your research and your career than staying an extra hour in the lab.

ANYTHING ELSE YOU WOULD LIKE TO SHARE?

Stephen: Be a good colleague, work hard, and keep a level head when things don't go your way. As long as you do those things in good faith, CDB will support you and you'll probably do very well. Also, grad school takes a long time — go out of your comfort zone, whether it's learning a new technique, hanging out with non-scientists (crazy, I know!), or exploring a new town in Michigan.

WE ASKED SCOTT BAROLO, WHAT WOULD WE BE SURPRISED TO LEARN ABOUT CHRISTINA?

Christina was my lab's first PhD trainee; she definitely taught me more than I taught her. Christina's kindness and her talent for teaching and training were evident very early in her PhD career, and she is putting them to good use now as an Assistant Professor at Arcadia University.

FROM STEPHEN'S MENTORS PUCK OHI AND KRISTEN VERHEY: WHAT WOULD YOU BE SURPRISED TO LEARN ABOUT STEPHEN?

Stephen was a previous student in the Verhey lab and postdoc in Puck Ohi's lab. They mention that Stephen is a man of many talents. He is a brewmaster and plays the clarinet. He is also a huge UNC Tarheels fan!

CDB ALUMNI? | WE WANT TO HEAR FROM YOU! SEND US AN EMAIL AT CDBALUMNI@UMICH.EDU

CDB PICNIC 2018





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Giving

Gifts of any size help us support our trainees and initiate high-risk research projects.

Thank you for considering!

Postdoctoral fellows are the cornerstone of laboratory research. In addition to their vital intellectual contributions and research accomplishments, they bring a curiosity and excitement for learning to our laboratories and to the University, which in turn, fosters the same in others. We wish to harness this energy and better help these creative young scientists take risks, develop preliminary data, and explore new research ideas.

With these goals, the Department of Cell & Developmental Biology is pleased to announce the launch of an innovative program to provide seed funding for postdoctoral fellows to try something a little out-of-the-box, something a bit risky, and/or something that has the potential to build a foundation for their future independent research programs. Our goal is to award career development grants of \$10,000 to help late-stage postdocs generate innovative and original research of their own to:

- Gather new pilot data
- Develop novel methodologies
- Apply new analytic techniques to existing data
- Take risks to develop high impact, otherwise unfunded research!

Recognizing that truly innovative research is often least likely to be externally supported, these awards aim to fill the that gap.

Please join the CDB faculty and staff in supporting our postdoctoral fellows and advancing research in Cell & Developmental Biology and the University of Michigan by giving today to the G. Carl Huber Postdoctoral Fellow Fund (320450):

leadersandbest.umich.edu/find/#/med/med/cdb



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