

Cell & Developmental Biology

Department Newsletter Fall 2019



MEDICAL SCHOOL
UNIVERSITY OF MICHIGAN

This image, "Becoming Her Brain" from the Gumucio laboratory, is part of the 2019 BioArtography collection. In the early embryo, dynamic folding of a flat sheet of cells gives rise to the neural tube, the precursor to the brain and spinal column. In humans, incomplete tube closure (neural tube defects) represents one of the most common types of birth defects. Some aspects of this dynamic cellular process can be studied using cells in culture, as done here. This image shows a "neural rosette" that spontaneously formed from cultured cells; this coordinated cellular behavior closely mimics neural tube formation. www.bioartography.com



Photography: Mohi Shakibafar

Kristen Verhey, Ph.D.
A. Kent Christensen Collegiate Professor and Associate Chair

Pierre A. Coulombe, Ph.D.
G. Carl Huber Professor and Chair

Interview With the Chair and Associate Chair

(Pierre) Hello Kristen. It has been quite a year for CDB! I wonder what you are most proud of when thinking of recent accomplishments involving the department. For me, it's launching the Michigan Postdoctoral Pioneer Program, which brings together an outstanding postdoctoral fellow and two mentors around an exciting research project. The fact that this is a collaborative venture with funding from the Endowment for Basic Sciences in the medical school, makes it very special.

(Kristen) Hello Pierre. I am particularly proud of the faculty mentoring program that we put in place this year. We have established mentoring committees for each of our young faculty and we provide administrative help for scheduling and reporting. These young faculty are the future of our department and we hope this will provide guidance and help for them to be successful. Speaking of the future of our department, what are you thinking about in terms of our most important goals for the department in the year ahead?

(Pierre) Thanks for asking! I wish for us to succeed with our search for two outstanding faculty members, one with expertise in developmental biology and another one with expertise in correlative light and electron microscopy. The latter position is part of the university's efforts to continue investing in cryoelectron microscopy through the Biosciences Initiative. I also look forward to continue working with our graduate stu-

dents and postdocs to foster a great environment for discovery, and for learning about all aspects of becoming an outstanding scientist and professional. How about you?

(Kristen) Well, you know I've been working with Mohi, our new communications director, on developing a departmental intranet so that people can quickly find information they need and for us to share best practices in terms of grant writing and other stuff. In the coming year, we will be focusing on using the intranet to improve communications within the department and so people can, for example, sign up for equipment using google calendars. I am hoping increased efficiencies can free up time to make more discoveries!

Pierre A. Coulombe, Ph.D.
G. Carl Huber Professor and Chair

Kristen Verhey, Ph.D.
A. Kent Christensen Collegiate Professor and Associate Chair



Annual newsletter of the Department of Cell & Developmental Biology of the University of Michigan Medical School. Editors: Pierre Coulombe, Kristen Verhey, Karen Lang, Traci Carulli, Kristen Hug, Annette Klomprens. Photography and Graphic Design: Mohi Shakibafar.

Highlights from Two Postdoctoral Research Fellows

Ashley Kalinski

Research Fellow, Giger Lab

Research focus:

I study neurons, which are our cells of the nervous system. Neurons are the reason we can think, feel, and move, and the axon is responsible for transmitting that information very long distances. I am specifically interested in what happens to axons after traumatic injury. Following injury, axons of the central nervous system fail to regenerate and are irreparably damaged, while axons of the peripheral nervous system can spontaneously regenerate. In the Giger lab, I study how the immune system communicates with damaged axons and glial cells after spinal cord injury or sciatic nerve injury. My work focuses on understanding these interactions and how signaling pathways can lead to axonal repair, or how they end up preventing repair. Our overall hope is that we can find new targets to help improve outcomes following spinal cord injury.

Recent publications/award or success story:

This has been quite the busy year for me. I was fortunate enough to present my research at an International Meeting on Axon Degeneration in Scotland this spring, as well as at The Society for Neuroscience Meeting in Chicago this fall. Additionally, I published a first author paper in The Journal of Cell Biology this year. This was thesis work that I was fortunate enough to finish up in Roman's lab, which highlights the collaborative nature of our work. Outside of the lab, I was selected as a Postdoc 180 Finalist. This had to be the most fun talk I have ever given!



Left: Ashley Kalinski, Research Fellow. Right: Corey Flynn, Undergraduate Student

Which part of your research or environment inspires you?

I am most inspired by the people around me. Just coming back from a conference, I am reminded of how amazing scientists really are. At our society meeting, we were surrounded by 27,000 neuroscientists who were just so excited to share their work with others. I was so impressed by the imagination, curiosity, and talent of all the trainees, but especially the undergraduate and graduate students. Knowing that there is an exceptional group of trainees leading the future of research just makes me that much more excited to continue my own work.

What is your favorite movie?

Honestly, this is the most difficult question here! Since having kids, I can't remember the last time I watched a movie that wasn't about princesses or superheroes. One movie I would never pass up the chance to watch would be Field of Dreams.

What was your first job?

My first job was in dietary at a community hospital. I delivered food trays to patients.

What is your favorite place for vacation?

Since we don't get to repeat vacations very often, this is a tough question. I can say my favorite place I have traveled so far has been Japan and I would love to go back with my family. My kids' favorite place to visit though has to be South Carolina.

Yu-Jie Chen

Research Fellow, Tsai Lab

Research focus:

I am focusing on the ER protein quality control system as well as ER-autophagy system. We recently identified an ER membrane morphogenic protein Reticulon 3 that disposes of luminal protein aggregates, including mutant proinsulin, via ER-autophagy. These findings likely have broader implications for a number of distinct human diseases.

Recent publications/award or success story:

I grew up in Taiwan and received a Ph.D. degree in Academia Sinica, Taiwan. After I graduated, I got a postdoctoral fellowship and worked in the same institute. Almost at the same time, I met Bill when he visited our institute in early 2017, and he offered me a postdoc position and brought me to Michigan. My recent publications in Bill's lab:

- DL Lin*, T Inoue*, YJ Chen*, A Chang, B Tsai and AW Tai. The ER Membrane Protein Complex Promotes Biogenesis of Dengue and Zika Virus Non-structural Multi-pass Transmembrane Proteins to Support Infection. 2019. Cell Reports 27 (6), 1666-1674. *co-first author
- YJ Chen, X Liu and B Tsai, SV40 Hijacks Cellular Transport, Membrane Penetration, and Disassembly Machineries to Promote Infection. 2019. Viruses 11 (10), 917.
- YJ Chen, J Williams, P Arvan and B Tsai. Reticulon protects the integrity of the ER membrane during ER escape of large macromolecular protein complexes. 2019. Journal of Cell Biology under revision.

Which part of your research or environment inspires you?

When I grew up in Taiwan, the culture there was such that we spent much more time working and studying hard alone. After I moved here, I found people pay much more attention to discussion and networking to make things more efficient and effective. This really encourages me to change my work style and try to take advantage of both cultures.

What is your favorite movie?

I have been a big fan of Marvel movies for a while. However, I have been far away from movie theater since my son Jayson was born last year.

What was your first job?

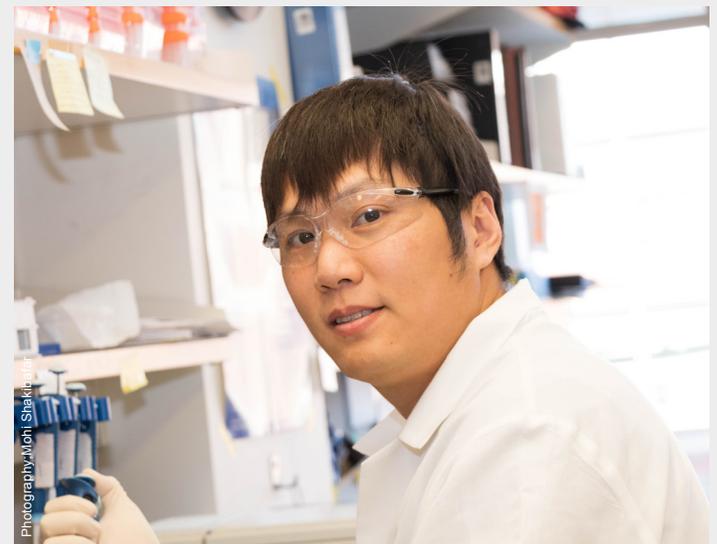
I guess this job is my first job officially.

What is your favorite place for vacation?

I just got back from a vacation in northern Michigan. I think I am falling in love with fall color in Michigan.

Is there anything else you want to share?

I love watching and playing sports. I still play basketball with colleagues every week. Sometimes, three PIs also join us, including Pierre, Idse, and Bill.



Yu-Jie Chen, Research Fellow

FACULTY HONORS & AWARDS



Maria Castro

Appointed to inaugural class of Rogel Scholars (Rogel Cancer Center)



Pedro Lowenstein

Named a Fellow of the American Association for the Advancement of Science (AAAS)



Doug Engel

Installed as the first Elizabeth C. Crosby Collegiate Professor



Carole Parent

Named a Fellow of the American Association for the Advancement of Science (AAAS)



Diane Fingar

EBS Teaching Award



Marina Pasca di Magliano

Appointed to inaugural class of Rogel Scholars (Rogel Cancer Center)



Deb Gumucio

Distinguished lecturer for the 2020 American Gastroenterological Association (AGA) Morton I. Grossman Award



Jillian Pearring

2018 Research Award funded by The E. Matilda Ziegler Foundation for the Blind



Peter Hitchcock

Fulbright Scholar Award



Swathi Yadlapalli

R35 MIRA award from National Institute of General Medical Sciences (1st major external award)



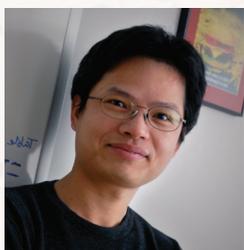
Michael Hortsch

Named a Fellow of the American Association of Anatomists (AAA)



Yukiko Yamashita

HHMI investigator appointment renewed for 7 years



Jiandie Lin

Named a Fellow of the American Association for the Advancement of Science (AAAS)



Cindy DeLong

O'Shea Lab
EBS Research Staff Award

STAFF AWARDS

POSTDOCTORAL AWARDS



Kyoung Jo
Heemskerck Lab
Michigan Postdoctoral
Pioneer Fellowship



Dan Schill
O'Shea Lab
- Elected UMPDA
(UM Postdoctoral
Association) 2019
Co-President
- Stern-Strategic
Translational Re-
search (STAR) Award



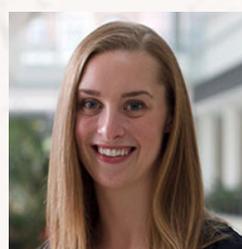
Nina Steele
*Allen and Pasca di Magli-
ano Labs*
- American Cancer
Society (ACS) Post-
doctoral Fellowship
- Best Poster Award
GRC on Pancreatic
Diseases



**Jorge Martínez-
Márquez**
Peering Lab
FASEB: Biology and
Chemistry of Vision
Conference Poster
Prize



Chelsey Spriggs
Tsai Lab
- NIH F32 NRSA Post-
doctoral Fellowship
- Bradley M. Patten
Award for Excellence
in Postdoctoral Re-
search



Kaylee Steen
Coulombe Lab
ASCB COMPASS
Outreach Grant for
Developing Future
Biologists

GRADUATE STUDENT AWARDS



Breane Budaitis
Verhey Lab
- Rackham Predoctoral
Fellowship
- EBS Edge Award



Henry Kuang
Lin Lab
NIH F30 NRSA Predoctoral
Fellowship



Anna Shirazyan
Allen Lab
- NIH F31 NRSA Predoctoral
Fellowship
- Selected short talk, AChemS
41st Annual Meeting 2019
- Shelley J. Almburg Graduate
Student Service Award



Corey Cunningham
Tsai Lab
Defended his Ph.D. Thesis



Ye Li
Cai Lab
Defended his Ph.D. Thesis



Aaron (Seth) Tooley
Fingar Lab
Genentech Summer
Internship



Allison Dupzyk
Tsai Lab
Defended her Ph.D. Thesis



Tongyu Liu
Lin Lab
Bradley M. Patten Award
for Excellence in Graduate
Research



Ashley Velez
Pasca di Magliano Lab
Selected oral presentation,
5th Annual Midwest Tumor
Microenvironment Meeting



**Martha Echevarria
Andino**
Allen Lab
- Selected short talk, American
Association for Anatomy Annu-
al Meeting
- American Association of
Anatomists Travel Award



Flor Mendez
Castro Lab
- Rackham Predoctoral
Fellowship
- Genentech Summer
Internship



Macy Veling
Ye Lab
Defended her Ph.D. Thesis



Amanda Erwin
Melanie Ohi Lab
- Selected short talk,
Microscopy and Microanal-
ysis 2019 Meeting
- Microscopy and Micro-
analysis Student Scholar
Award



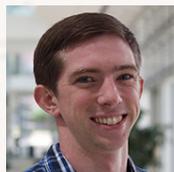
Fred Shen
Cai Lab
NIH F31 NRSA Predoctoral
Fellowship



Bridget Waas
Allen Lab
Genentech Summer
Internship



Emily Holloway
Spence Lab
- NIH F31 NRSA Predoc-
toral Fellowship
- Ph.D. Poster Award,
Copenhagen Bioscience
Conference on Intestinal
Organoids



Mike Scales
*Allen and Pasca di Magliano
Labs*
- NIH F31 NRSA Predoctoral
Fellowship
- PIBS 20th Anniversary Student
Award
- Sarah Winans Newman Grad-
uate Student Teaching Award



Natalie Warsinger-Pepe
Yamashita Lab
- EBS Edge Award
- PIBS 20th Anniversary
Student Award

Alumni Update

We recently had an opportunity to catch up with two of our alumni, Amanda Evans Zacharias & William Zacharias

Amanda Evans Zacharias

CDB Start Date: 2004

Mentor: Phil Gage

PhD: 2009

Dissertation Title: Lineage-Specific Functions of the Homeodomain Transcription Factor Pitx2 in Eye Development



Amanda Evans Zacharias

What is your current job and title?

Assistant Professor of Developmental Biology at Cincinnati Children's Hospital Medical Center

What do you do on a typical day?

Help the people in my lab with experiments, do a few experiment/data curation myself. Work on writing papers and grants. Attend seminars, stay up to date on the literature and kibitz with the other new faculty.

What do you like most/least about your job?

Most: It's such a privilege to get paid to do research and it's so exciting to learn something new. I feel like a kid on Christmas morning on days when I come into lab knowing I have the results of a new experiment waiting for me. Least: It's been harder than I thought to find and manage good people.

What do you wish you had known when you were a CDB grad student?

You can be a PI at an R1 institution. I never really discussed this with my advisor or other mentors because it felt like an unrealistic and arrogant goal. I wish I had because I think they would have told me they thought I could do it!

CDB ALUMNI?

WE WANT TO HEAR FROM YOU! SEND US AN EMAIL AT CDBINFO@UMICH.EDU

Anything else you would like to share?

2 unrelated pieces of advice:

1. Take a computer science course—it's actually not that scary and it will help you so much!
2. You can make it work as a dual career couple but it will take some patience and strategic planning.

Will Zacharias

CDB Start Date: 2005

Mentor: Deb Gumucio

Dissertation Title: Homeostatic Roles for Adult Intestinal Hedgehog Signaling: Insight into Smooth Muscle Maintenance and Inflammatory Control
MD: University of Michigan, Ann Arbor, MI, 2011.

PhD: University of Michigan, Ann Arbor, MI, 2011.

Residency: Hospital of the University of Pennsylvania, Philadelphia, PA.

Fellowship: Hospital of the University of Pennsylvania, Philadelphia, PA.

Certifications: Internal Medicine; Pulmonary Medicine; Critical Care Medicine.



Will Zacharias

What is your current job and title?

Assistant Professor of Medicine and Pediatrics, Divisions of Pulmonary Biology and Pulmonary and Critical Care Medicine, at the University of Cincinnati and Cincinnati Children's Hospital

What do you do on a typical day?

Depends completely on whether I am on clinical service. When I am working in the hospital, I attend in the Medical Intensive Care Unit (MICU). On clinical days, I arrive early, round with the clinical team in the ICU, usually go to the lab/office for about 1-2 hours to check in, and then head back to discuss new admissions or changes during the day with my clinical team. When I am not on service, I devote 100% of my time to research. On those days, I spend about

half my time supervising work in my lab and meeting with lab members, and the other half reading, writing, and working on educational activities. I'd like to be at the bench more often, but it's hard to find time to really get into an experiment with the amount of email and manuscripts I have been working on as a PI.

What do you like most/least about your job?

I love getting to both take care of patients and drive a research program designed to understand their disease and develop new therapies. I love working with medical and graduate students, post-docs, and residents/fellows both in lab and in the ICU. Getting to build a lab is quite difficult but has been fun, especially now that I have a team that I really like working with. The opportunity to try to push a field forward and be able to really understand the major new techniques in science is as good as I hoped it would be during training. On the other hand, the stream of email I get/need to respond to on a given day is oppressive. I have a number of things that are important, but which generate a number of emails and action items, and having to figure out how to structure my day to get those things done but still focus on thinking about science has been a challenge.

What do you wish you had known when you were a CDB grad student?

The major keys to achieving your goals with a career in science are simply perseverance and time management. Keep showing up, doing experiments, thinking as hard as you can, and define your perfect job in science the way you want, rather than for any particular ideal. I used to think anything other than academic PI was a "non-standard" path. I don't think that anymore – senior scientist, industry, even things like consulting have been successful pathways for friends from my own training. Organize your time so you can have a life outside of lab and be productive with your time in lab. I wanted to be an academic PI, and I'm almost certain the main reason I achieved that goal was primarily showing up and trying to be productive every day even when it seemed like nothing would work. I thought PIs had some sort of particular brilliance or skills when I was a student, but now I think the most successful people are those who are determined and organize their time to maximize the skill set they have.

Anything else you would like to share?

Everyone says that your time as a grad student and post-doc is the ideal time to do really productive science and the "best" time of your training. I thought this was sort of silly – why not want to be a PI and have the opportunity to follow your scientific vision? Turns out "everyone" is right – the amount of non-scientific tasks that a PI is responsible for – grants, correspondence, committees, regulatory management – is tremendous and really limits time for creative and deep thinking. As tough as parts of the grad student and post-doc experience are, I tell trainees now to try to really embrace the freedom that being more junior provides and go for it with your best ideas. I miss the opportunity to set aside my responsibilities and do a big experiment – my schedule is packed now and it's just so much harder.



2019 in Pictures



Rigorous training in laboratory research represents a crucially important investment for nearly all scientists, regardless of whether they continue on to careers in academia, government, education, science communication, or other fields. While the fundamentals of rigorous training in Cell & Developmental Biology (CDB) remain a high priority, we must continue to adapt our training programs in response to new technologies, as well as changes in federal support for academic-based training programs. To a significant degree, the blossoming of junior faculty in CDB (including new recruits) justifies and even drives the need for these investments in our programs, such as:

Giving

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

- Ph.D. student education supported by gifts to the Bradley M. Patten Memorial Fund (795380)
- Postdoctoral student education supported by gifts to the G. Carl Huber Postdoctoral Fellows Fund (320450)
- Bold, innovative science supported by gifts to Watching Molecules at Work: Building Technologies for the Future (324124)

With your generous gifts toward CDB trainees and innovative research, postdoctoral fellows and Ph.D. students have vital support to gather new pilot data, develop novel methodologies, apply new analytic techniques, and the ability to take risks in developing high impact research that would otherwise be unfunded.

Please join the CDB faculty and staff in supporting our postdoctoral fellows, Ph.D. students and innovative science. For further information, or to give, please visit www.umichcdb.com. Thank you for considering!



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