Cellular & Molecular Biology Newsletter

Fall 2018

MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

NEWSLETTER COMMITTEE

MORGAN GINGERICH
ALLYSON MUNNEKE

A NOTE FROM THE DIRECTOR

DR. BOB FULLER
DIRECTOR, CMB

As we begin a new academic year, I'd like to thank Associate Directors Kathy Collins and Ken Cadigan for agreeing to serve as Co-directors while I am on sabbatical. I'd also like to welcome Ben Allen as a new Associate Director, replacing Vern Carruthers. He will also serve as our Rackham Diversity Ally. Ben has great passion for graduate education and has been Associate Director of the U of M PREP program for several years. Ben has also agreed to help develop a new workshop for refresher training in the responsible conduct of research to be held later this fall or in the winter semester. He and I have also discussed the development of workshops on rigor and reproducibility in research, and we welcome your input.

A few thoughts on rigor and reproducibility. The focus by the NIH on this topic arose in part as a reaction to studies that concluded, provocatively, that most published research findings are false [e.g., Ioannidis, JP (2005) Why most published research findings are false. PLoS Med. 2(8):e124]. Much of this analysis has been done of clinical studies or of other research heavily reliant on statistical analysis of data. A consequence of this is that the remedy proposed to a large extent relies on providing students with more extensive training in statistical analysis of data. I would contend that this is certainly helpful, but does not cover the breadth of what is needed.

In experimental science, the objective of course is to provide critical tests of hypotheses, with those tests allowing one only to eliminate hypotheses, not to prove them. A wise experimentalist draws conservative conclusions and realizes that in science, all "facts" are provisional. This puts the focus for rigor and reproducibility on experimental design where the correct selection of proper controls is often as or more important than rigorous statistical analysis of data.

A NOTE FROM THE DIRECTOR (CONT.)

A manifesto written by John Ioannidis and colleagues proposes that optimization of "methods, reporting and dissemination, reproducibility, evaluation and incentives" will improve the reliability of published scientific results [Munafo, MR, et al. (2017) A manifesto for reproducible science. Nat. Hum. Behav. 1:article 0021]. NIH has made rigor and transparency a major focus both for research and training grant applications. The new instructions for training grant applications from NIGMS (https://grants.nih.gov/grants/guide/pa-files/PAR-17-341.html) require applicants to create a "Plan for Instruction in Methods for Enhancing Reproducibility," with an emphasis on explaining how students' training in this area will be enhanced throughout their Ph.D. studies. Clearly, the intent of our coursework, our prelim process, the mentoring relationship and the operation of our dissertation committees is to train students in planning, conducting and publishing significant, rigorous and reproducible research.That said, what we are considering is the creation of a course or series of workshops, to be taken primarily by students shortly after joining CMB, that will focus on the parameters of what it takes to carry out well-controlled, documented and analyzed experiments in several exemplary areas (e.g., imaging, biochemistry, genetic analysis). We hope this will develop and enhance the critical skills of all CMB students.

One final thought. When the issue of misconduct in science became a hot topic in the late 1970s and early 1980s, some concern was voiced concerning overreaction by the popular press and government. One of the clearest thinkers in this area was UC Berkeley biochemist and social activist Howard Schachman, who helped craft rational approaches to training in responsible conduct of research. I encourage you to watch this brief video of Dr. Schachman discussing the history and evolution of ideas about RCR. Dr. Schachman, who was a key figure in allosteric regulation of ATCase, died in 2016 at the age of 97. The video (2012): https://www.youtube.com/watch?v=tktkwABvf6k

MEET THE NEW CMB STUDENTS

Elizabeth Gensterblum-Miller

Mentor: Chad Brenner
Fun Fact: One of her favorite hobbies is crochet

Mara Hardwood

Mentor: Billy Tsai
Fun Fact: She has an 8 year old dog named Ruby

Marshall Howington

Mentor: Scott Leiser
Fun Fact: He was once stalked at 2:00 AM, then terrified by a blind, blueberry pop-tart eating donkey named Ford Ranger

NEW CMB STUDENTS

Michael McMillian

Mentor: Sami Barmada
Fun Fact: He is a die hard Boston sports fan

Ariel McShane

Mentor: Mats Ljungman
Fun Fact: She played viola for 10 years

Anna Michmerhuizen

Mentor: Corey Speers
Fun Fact: In high school, she was a Dutch Dancer as part of the annual Tulip Time Festival

NEW CMB STUDENTS

Maria Virgilio

Mentor: Kathy Collins
Fun Fact: She is currently teaching herself the ancient art of glove-making

Alex Vizurraga

Mentor: Gregory Tall
Fun Fact: He enjoys playing the cello and has performed in several orchestras

Candilianne Zayas

Mentor: Manoj Puthenveedu
Fun Fact: Worked in a small town in Greece studying bottlenose dolphins

Q & A WITH THE NEWEST CMB ASSOCIATE DIRECTOR: DR. BEN ALLEN

Q1: What other positions do you have at UM?

Ben is involved with a number of departments and organizations in the Medical School. He is an Associate Professor in Cell and Developmental Biology. In addition, he is a faculty director of the Microscopy and Image Analysis Lab, and he helps coordinate a post-baccalaureate program for under-represented students.

Q2: What does your lab study?

The Allen Lab is "All Hedgehog, all the time." Ben's lab studies Hedgehog signaling, which is a major developmental signaling pathway in almost every tissue in the body. This pathway is also disrupted in certain cancers. His lab seeks to better understand this pathway both in terms of development and cancer progression.

Q3: What advice do you have for incoming students?

When choosing rotations and ultimately a thesis lab, Ben advises to focus on communication with the mentor. In particular, being comfortable with showing your advisor data that "blows a hole" in your model. Even though this may seem frightening (especially if you have been working on the project for several years), this data is often what leads to some of the most exciting, and unexpected scientific discoveries.

Q & A WITH THE NEWEST CMB ASSOCIATE DIRECTOR: DR. BEN ALLEN

Q4: What are your favorite things to do in Ann Arbor?

Ben's favorite restaurant in Ann Arbor is Cardamom. He even knows the owners; they were the first people he met when his family moved to Ann Arbor! Fun fact: the dumplings are named after the owners' two sons; the larger dumpling is named after the eldest and the smaller dumpling is named after the younger son.

His favorite activity in Ann Arbor is kayaking on the cascades of the Huron River. On one adventure with his lab, one of his students went through part of the cascades backwards, then flipped their kayak, before realizing they could just stand up!

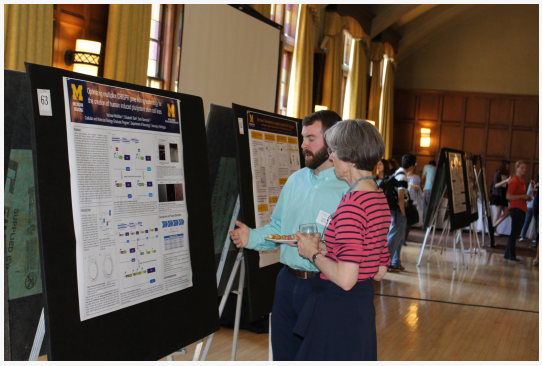
Q5: What is a fun fact that most people don't know about you?

Ben has a twin brother, who is also a biology professor at the College of William & Mary. Following a field expedition, he discovered that he had a parasitic nematode living in his cheek! He not only removed the worm himself, but went on to study the worm he affectionately named "Buddy" in his lab. In doing he, he discovered he was only the 13th documented case of human infection by *Gongylonema pulchrum.*

For a dramatic recreation as featured on Animal Planet's "Monsters Inside Me," follow the link below:

https://www.animalplanet.com/tv-shows/monsters-inside-me/videos/biologist-removes-parasite-from-his-own-mouth

WHAT ARE CMB STUDENTS UP TO?



CMB students present their research...

Michael McMillian presenting at the 2018 CMB Symposium

...they know how to have fun...

Henry Kuang dressed as a sharps waste bin for Halloween

And love volunteering within the scientific and local communities!

(Top): Shahana Ahmed at a Scientist Spotlight event at the UM Natural History Museum
(Bottom): CMB students & faculty at Food Gatherers