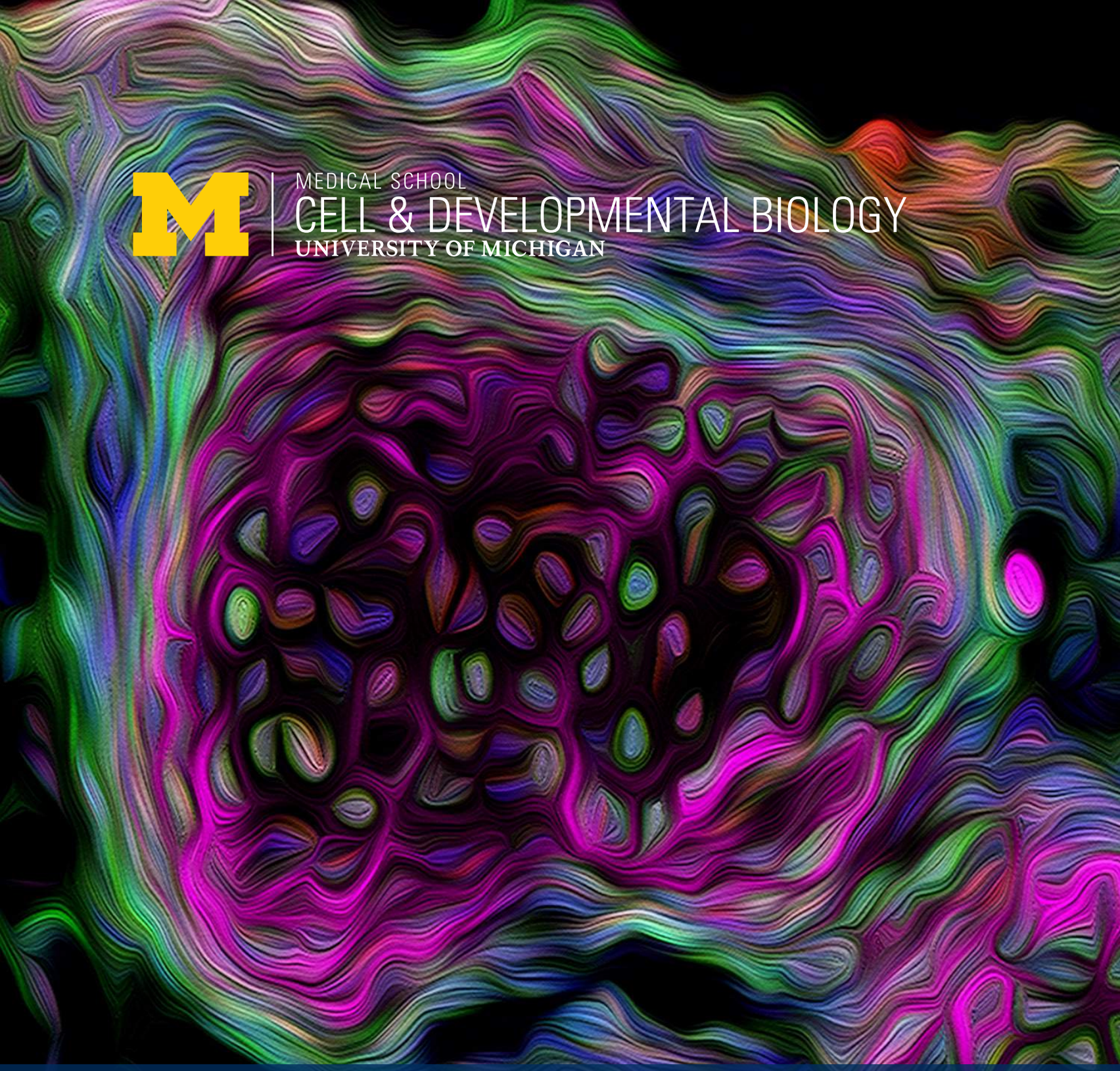


MEDICAL SCHOOL
CELL & DEVELOPMENTAL BIOLOGY
UNIVERSITY OF MICHIGAN

DEPARTMENT NEWSLETTER

Fall 2016

This image is from an experiment in which mouse stem cells (in green) were treated to form a 3D cartilage nodule (pink/purple) in a dish. The image was taken by Kyriel Pineault in the Wellik lab with a confocal microscope and edited to create the psychedelic effect. It is a part of the 2016 BioArtography collection.

MESSAGE FROM THE CHAIR

Kristen Verhey, Ph.D.

What a great time to be part of CDB! This summer I took over as Interim Chair and I am most grateful to Doug Engel and Deb Gumucio who have worked tirelessly to develop a department that is collegial, collaborative, exciting, engaged in a variety of cutting-edge research endeavors, and dedicated to training the next generation of scientists.

In addition to the stimulating science, wonderful awards, and fantastic outreach programs you will read about in this newsletter, CDB has lots of exciting stuff going on. We are implementing new career development activities for our graduate students. We have initiated a new program for our postdoctoral fellows and research faculty. Our faculty continue to be rewarded for their efforts with highly competitive grants despite the tight funding climate. The search process for a new Chair of CDB has begun and we look forward to welcoming a new leader to our corner office.

Beyond CDB, there are many important and interesting things happening at U of M. The President has issued a challenge to the university community to develop and implement plans to "create an inclusive and equitable campus; recruit, retain and develop a diverse university community; and support innovation and inclusive scholarship and teaching." The Medical School continues to push forward efforts that support basic science research, increase innovation, and drive translational science.

Kristen Verhey

We hope that you will continue to stay in touch with us over the year. Join us on Facebook, Twitter and LinkedIn. Visit our website https://medicine.umich.edu/dept/cell-developmental-biology. Or send us an email cdbinfo@umich.edu. We would love to hear from you and share in your successes as well!

Kristen J. Verhey, Ph.D.
A. Kent Christensen Collegiate Professor
Professor and Interim Chair of Cell and Developmental Biology

EHRA Excellence in Hemoglobinopathies Research Award

In 2012, the National Heart, Lung and Blood Institute issued a Program Announcement calling for proposals to advance our knowledge and to develop new treatments and possible cures for sickle cell anemia (SCA), the most common inherited human disease. Dr. Doug Engel teamed up with researchers and clinicians from the University of Illinois-Chicago and the Cleveland Clinic and was successful at securing one of these 5-year research grants. It has been known for more than two decades that simply by increasing the levels of fetal hemoglobin (HbF) by inducing γ-globin expression in patients suffering from SCA, most of the symptoms and pathologies of the condition can be ameliorated. Beginning around 2000, they began to uncover the repressor and co-repressor molecules in red blood cell precursors that block the synthesis of HbF. Thus, the aim was to develop small molecule therapeutics that would inhibit the activity of these co-repressor molecules.

In the first four years of this award, lead compounds that target two different co-repressor molecules, DNMT1 and LSD1m, have been identified and shown to be effective in inducing HbF expression in human tissue culture model systems, as well as in mice bearing the sickle cell gene, and in baboons, the best animal model for human disease studies. While the anti-LSD1 lead compound is still being improved, the anti-DNMT1 drug has been shown to be a safe and effective compound with no significant side effects in human phase I clinical trials, and a phase II/III clinical trial is currently planned. The goal is to provide a superior alternative to the current standard of care in this field, and relief for the millions of people worldwide who suffer, and die, from this devastating disease.

FACULTY HONORS & AWARDS

Doug Engel

Ajit Joglekar

Daniel Lucas-Alcaraz

Xuyun Zhao

Doug Engel presented the President's Lecture at the 89th Annual Meeting of the Japanese Biochemical Society.

Michael Hortsch was awarded the 2015 Teaching Award for Cell and Developmental Biology from the Endowment for the Basic Sciences (EBS).

Ajit Joglekar was awarded a 2016 ASCB-Gibco Emerging Leaders Prize by the American Society for Cell Biology (ASCB). He was lauded for showing how the kinetochore implements mechanochemical signal transduction, especially that kinetochore–microtubule attachment mediates silencing of the spindle assembly checkpoint in budding yeast.

Lei Lei was a 2016 recipient of the Jones Foundation Young Investigators Achievement Award for her project "Role of Balbiani body-associated RNP complexes in determining oocyte developmental potential."

Daniel Lucas-Alcaraz received an Undergraduate Research Opportunity Program Outstanding Research Mentor Award. These exceptional mentors demonstrate an interest in the college experiences, academic goals, and career plans of their students.

Yukiko Yamashita was awarded a Faculty Recognition Award from the Rackham School of Graduate Studies for her substantive contributions to the university through achievements in scholarly research or creative endeavors; excellence as a teacher, adviser and mentor; and distinguished participation in service activities of the university.

Xuyun Zhao, a Research Investigator in Jiandie Lin's lab, was awarded an NIH K99/R00 Pathway to Independence Award.

Maria Castro's application was selected for a Jacob Javits Neuroscience Investigator (R37) Award, a conditional seven-year research grant given to highly meritorious scientists selected by the NIH Advisory Council for the National Institute of Neurological Disorders and Stroke (NINDS).

Michael Hortsch

Lei Lei

Yukiko Yamashita

Maria Castro

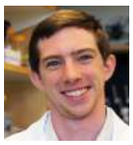
21 Primary Faculty

18 Joint Faculty

12 National ranking of Cell Biology Departments 2015

GRADUATE STUDENT AWARDS

Martha Echevarria-Andino
Allen Lab
Shelley J. Almburg Graduate Student Service Award



Michael Scales
Allen and Pasca di Magliano Labs
Bradley Merrill Patten Fellowship, Center for Organogenesis Predoctoral Fellowship

David Lorberbaum
Barolo Lab
Defended his Ph.D. Thesis

Aaron Seth Tooley
Fingar Lab
Bradley Merrill Patten Fellowship

Yevgeniya Mironova
Giger Lab
Defended her Ph.D. Thesis

Ryan Passino
Giger Lab
Sarah Winans Newman Graduate Student Teaching Award

Lucas Huffman
Giger Lab
NIH NIGMS Pre-doctoral Fellowship

Andrew Freddo
Gumucio Lab
Defended his Ph.D. Thesis

Ashley Velez
Pasca di Magliano Lab
Bradley Merrill Patten Fellowship

Rabia Malik
Sivaramakrishnan Lab
Defended her Ph.D. Thesis

Carter Swanson
Sivaramakrishnan Lab
Defended his Ph.D. Thesis

Emily Holloway
Spence Lab
Bradley Merrill Patten Fellowship, Cellular Biotechnology Training Program Fellowship

Briana Dye
Spence Lab
Defended her Ph.D. Thesis

Breane Budaitis
Verhey Lab
NSF Graduate Research Fellowship

Michael Lang
Weisman Lab
Defended his Ph.D. Thesis

Sara Wong
Weisman Lab
University of Michigan Medical School Graduate Student Excellence in Service Award

Kyriel Pineault
Wellik Lab
Center for Organogenesis Predoctoral Fellowship

Danielle Rux
Wellik Lab
Bradley M. Patten Award for Excellence in Graduate Research, Endowment for the Basic Sciences EDGE Award, Defended her Ph.D. Thesis

Ason Chiang
Yamashita Lab
Defended his Ph.D. Thesis

POSTDOCTORAL AWARDS

Martin Engelke
Verhey Lab
EMBL Advanced Training Centre Corporate Partnership Programme Fellowship

Mary Lee
Engel Lab
NIH NRSA Individual Postdoctoral Fellowship

Ashley Kalinski
Giger Lab
NIH Training in Clinical and Basic Neurosciences Grant

Chia-Jui Ku
Engel Lab
Bradley M. Patten Award for Excellence in Postdoctoral Research

Bethany Strunk
Weisman Lab
NIH NIGMS K99 Pathway to Independence Award

DIVERSITY, EQUITY AND INCLUSION

In 2015, the University of Michigan's President Mark Schlissel, M.D. Ph.D., launched a campus-wide effort on Diversity, Equity, and Inclusion (DEI) (follow the link on our website: https://medicine.umich.edu/dept/cdb/diversity-cdb). Each school, college, and department was charged with creating a strategic plan. We held a series of focus groups for students, faculty and staff and the first of what will become an annual Diversity Discussion luncheon. The CDB department has had a long-standing commitment to preserving and enhancing diversity, equity and inclusion in all of its educational, research and administrative efforts. Yet there is more to do and we continue to push innovative approaches to building a cohesive and committed atmosphere where diversity thrives. For example, CDB has been the home for the university-wide NIH-sponsored Post-baccalaureate Research and Education Program (PREP) since 2009. This program brings a dozen post-bac students from underrepresented groups to U of M for an intensive year-long research experience and helps them apply to and thrive at excellent graduate programs in the biomedical sciences, chemistry, public health and engineering. Our own Kate Barald is the Director of this program and Ben Allen is an Associate Director. Our faculty and students have also pushed diversity efforts in the founding and implementation of the Developing Future Biologists program.

CDB alumnus Brandon Carpenter and 2015 DFB participants in Puerto Rico

Below (L-R): 2016 DFB Team - Jorge Martinez, Justine Pinskey, Eden Dulka, Samhitha Raj, Leilani Marty Santos, Martha Echevarria-Andino, Alana Chin, David Lorberbaum, Ben Allen, Scott Barolo

DEVELOPING FUTURE BIOLOGISTS

2016 was year two for our Developing Future Biologists (DFB) program and was again a huge success! In May, our DFB members traveled to Puerto Rico to give a short course on developmental biology. This year we opened the program to the entire University of Puerto Rico (UPR) system. We provided educational instruction using several model organisms (mice, fruit flies, frogs and chick embryos) and through interactive lectures and hands-on experiments, we were able to teach students about embryogenesis, organogenesis, developmental signaling, and the role of developmental genes in disease. We also provided career development exercises such as learning to present a poster, practicing public speaking, and writing a CV.

As a result of providing developmental biology education in an engaging manner, the students who attended the course were excited to discover the intricacies of development in model organisms. After participating in the DFB short course, several students applied and were accepted to perform undergraduate research in labs in Puerto Rico. Additionally, several students who took the course successfully applied and were awarded travel grants to present their undergraduate research at the 2016 Annual Biomedical Research Conference for Minority Students. Furthermore, the impact of the DFB short course can be seen in plans to add a developmental biology course at the UPR-Ponce campus. This course has been developed in part due to the collaboration between the DFB team and UPR-Ponce over the past two years. Two other UPR campuses plan to offer a development course for the first time in several years.

What's next? The 2017 DFB team has decided to bring the DFB short course to the University of Michigan! This will allow us to use the resources of our campus for the benefit of local underrepresented students from UM and from other colleges throughout MI. We are currently recruiting new DFB members so that we can expand the course curricula, reach more students, and continue the course for years to come. We recently became an official UM student organization with CDB as our sponsor! To learn more and follow us throughout the year, go to http://www.developingfuturebiologists.com/. If you want to contribute funds to help support our goals, go to https://leadersandbest.umich.edu/find/#!/give/basket/fund/325765. Every bit helps!

ALUMNI UPDATE

We recently had an opportunity to catch up with two of our alumni.

Above: Matt Velkey (Ph.D. CDB 2005) and his wife, Susan Johnson

J. Matthew Velkey
(O'Shea lab, 2005)

https://www.linkedin.com/in/matthew-velkey-79974317

Kaleena (Bernardi) Dezsi
(Tsai lab, 2009)

https://www.linkedin.com/in/kaleena-dezsi-ph-d-903b1175

Above: Lynn Kee (Ph.D. CDB 2012), Kaleena Bernardi-Dezsi (Ph.D. CDB 2009) (holding son Austin), Chris Dezsi (holding daughter Lauren), Jay Pieczynski (Ph.D. Biochem 2010)

What is your current job and title?

Matt: Assistant Dean for Basic Science Education, Assistant Professor of Medical Education, Duke University School of Medicine, Department of Cell Biology; Adjunct Lecturer
University of Michigan, Department of Cell & Developmental Biology

Kaleena: Clinical Research Associate – Having joined the regulatory world of clinical trials, I am currently leading the implementation of the OneIRB Coordinating Center at the Health Informatics Institute, University of South Florida.

What do you do on a typical day?

Kaleena: I actively work with IRBs and clinical sites across the country to facilitate the transition to a central IRB model for studies under the Rare Disease Clinical Research Network and TrialNet.

Matt: I teach histology, embryology, anatomy, and neurobiology to medical students, students in a doctor of physical therapy program, and students in Duke's new Masters of biomedical science program. As such, my "typical" day is either spent in a lecture hall, classroom, or lab or otherwise engaged in activities related to teaching or assessment. I also help manage many of Duke's online learning resources in anatomy, embryology, histology, and pathology so I am very frequently online updating these websites. In addition to these teaching responsibilities, I provide administrative oversight of the pre-clinical curriculum at Duke as the Assistant Dean for Basic Science Education. Luckily, I get to work with a lot of equally dedicated educators who serve as course coordinators and do most of the actual work in running each of the courses, so I'm not so much involved with the day-to-day administration of the curriculum. However, my administrative role is to look at the pre-clinical curriculum as a whole to see where there are gaps or redundancies or if there are opportunities for improvement and to help implement these changes.

What do you like most/least about your job?

Matt: I really enjoy getting to work with each of the students and my colleagues in the various health professions programs and the continual challenge of trying to improve our curricula. Just as a research lab's body of work is continually evolving, so too are the curricula we use to train the next generation of health professionals and scientists and it is great to be a part of that process. However, as much as I enjoy being so engaged in so much teaching, I feel that it sometimes pulls me in too many directions and I am not as able as I would like to really focus on a project and see it come to fruition sooner. Instead, the projects all get put into the background and I spend time here or there tending to each a little at a time.

Kaleena: Most: I really enjoy working with a variety of individuals in the regulatory field to troubleshoot and develop best practices to implement a program that has the ability to save researchers and administrators time and effort, while still protecting research participants.

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

Kaleena: Your career goals and interests may change, and that's okay! What's important to remember is that the skills you develop during your graduate training prepare you for a variety of career paths, allowing you to make a difference and have a strong impact in whatever field you choose.

Matt: As a grad student, I always knew that I really wanted to teach, and, in hindsight, I know there is no way I could do what I do now were it not for the graduate training I received in anatomy, cell biology, and developmental biology. However, I wish I had known just how focused I would become on teaching in the health professions and how much my teaching could have been informed by actual clinical practice, so there is a piece of me that wishes I had more seriously considered trying to fit medical school into my training.

We asked Billy Tsai, What would we be surprised to learn about Kaleena?

Kaleena is an amazing softball player, with rumors that she has a "cannon" for her arm, throwing a softball at > 60 mph!

We asked Sue O'Shea, What would we be surprised to learn about Matt?

Despite his many accomplishments, Matt is a country boy at heart - his nickname in the lab was "Bubba."

Always seeking answers to life's important questions, our graduate students wondered, "What would you do in a zombie apocalypse?"

Emily Holloway: "I would figure out how to melt the pipettes and make an archery set. And be like Katniss Everdeen with all of the serological pipettes."

Diane Fingar: "Teamwork. I would gather a team of good people, not the bad people. I would find a defendable structure, with a team of good people, where we are all trying to help each other survive. Weapon of choice would be a super long machete."

Ben Allen: "I would take the heavy duty orange gloves that you use for the liquid nitrogen and crazy glue on as many layers of the ultra sharp razor blades as I can, and use that to weave through them until I can get out of the building. That would get me outside, and then I'd lock myself in a bar and wait it out."

Roman Giger: "Run away. And then I'd fight back. I'd recruit volunteers from my lab and fight back. Weapon of choice? Pulp Fiction samurai sword."

Mike Scales: "Isolate a region. Find food and water access. Basic self defense. And sustainability. Weapon of choice? Close range would be a long machete or some sort of semi automatic rifle for more general use."

Jing-Ping Lin: "Zombies?? How many of them? Like the whole world was zombies? I'd act like a zombie and join them. There's no way you can fight them so might as well be one of them."

Seth Tooley: "If I'm here in lab and it happened outside, I would lock myself in a room that had key code access and I would go outside to that fridge and get everything I could. I wouldn't go outside. Unless they were really slow zombies. Then I would go to the hospital because it's a bigger building and there are multiple places to go."

Kristen Verhey: "Play dead."

Above: Resident zombie and 2014 Halloween costume contest winner Diane Fingar

PHILANTHROPIC SUPPORT FOR RESEARCH AND STUDENTS IS PLAYING AN INCREASINGLY IMPORTANT ROLE IN CDB.

We were fortunate to receive new support from the family of Shelley J. Almburg. Shelley was a long-time, very valued member of the MIL staff who passed away in June 2015. The Shelley J. Almburg Graduate Student Service Award was initiated by Shelley's family to award a student in Cell & Developmental Biology who exhibits the same spirit as Shelley in being supportive, kind, patient and having an amazing sense of humor. There was no one she couldn't help. This year's recipient was Martha Echevarria-Andino, who exactly fits these criteria!

Gifts of any size help us initiate high risk research projects and to support our students.

To donate to any of our initiatives use the online giving site: https://leadersandbest.umich.edu/find/#/med/med/cdb

The Department was also fortunate to receive funding from the Beattie family to support stem cell research. In January 2016, four CDB faculty were selected to receive "Idea Grants" to allow them to take on high-risk projects. Dr. Dawen Cai has used the funds to develop a novel single cell mRNA sequencing platform to isolate and profile very rare populations of neural stem cells from Drosophila and mouse brain. In a project led by Dr. Lei Lei, Idea funds were used to identify new mRNAs that play an essential role in determining mammalian oocyte developmental potential. In Dr. Scott Barolo's lab, the Idea award allowed them to identify novel stem cell populations in the Drosophila testis and ovary. Dr. Qing Li used her funds to test compounds that alter the metabolism of human leukemia cells to determine if modulating their metabolism can sensitize leukemic stem cells to chemotherapy and radiation.

New research funds from the Tam Foundation to support stem cell research and the origins of bipolar disorder allowed us to purchase an IncuCyte Zoom microscope, which takes repeated photomicrographs of cells inside an incubator. The movie (https://medicine.umich.edu/dept/cdb/news/archive/201508/new-incucyte-zoom-live-cell-imaging-system) illustrates neuronal differentiation of neural precursor cells derived from induced pluripotent stem cells (iPSCs) over a 7 day period of culture.

The Research Fellows program is an inaugural program led by Drs. Jiandie Lin and Shiying Jin to facilitate the careers of our research faculty and postdoctoral researchers. Support for this important program comes from the Carl Huber Postdoctoral Fellows Fund.

A lecture to honor Dr. Sun-Kee Kim, who served for many years as director of the medical histology course and made innumerable improvements to the teaching materials, will be held on October 25, 2017. Consistent with Dr. Kim's long-term research interest in secretory pathways, Dr. Tom Rapoport of Harvard Medical School will present the inaugural lecture.

Outreach continues to be a high priority and is carried out in many venues, including events at the Ann Arbor Public Library, Osher Lifelong Learning Institute, and via BioArtography. We are also planning an event to "Open Our Labs" to the public in the new year.

Thank you for your support!

Left: Shelley Almburg

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