Content

- From the CDB chair 3
- Introducing a new CDB course 4
- Welcome to the New CDB Faculty, Shyamal Mosaganti 6
- CDB students update 7
- My experience as a CDB postdoc 8
- Alumni Update 10
- Discovering the new generation of Biologists! 12
- A Vibrant Celebration of Black Microbiologists 14
- Story from CDB Admin team: working at COVID-19 situation 16
- A tale of how the intersection between music and science has sculpted the ideas of a cell biologist 18
- Honors & Awards 20

On the Cover:
Photo by: Sarah Kearns, Graduate Student, Chemical Biology (Cianfrocco and Verhey Labs), Life Sciences Institute and Department of Cell & Developmental Biology

Like human cities and towns, which have sidewalks for humans and roads for vehicles, cells use different kinds of tracks for particular types of transport. Here we see one such network, called the microtubular network, the cell’s molecular highway. As the saying goes, “all roads lead to Rome,” and microtubule highways are no different: their central hub or organizing center is located towards the middle of a cell near the nucleus. Cargo-carrying motor proteins travel on these molecular roads to bring their freight to different parts of the cell, following organized chemical and protein-based traffic signs that decorate the microtubules. Just as in rush hour, these highways are heavily used by motor proteins traveling to and from the organizing center. They are also constantly under construction, growing and shrinking as needed. Watching this frenzied movement, the goal is to decipher the dynamics of microtubules and explore how the traffic signs bring some order out of this chaos.
FROM THE CDB CHAIR

Welcome to our 2020 Newsletter. With great pride, I invite you to read about some of the impressive accomplishments of the Department of Cell & Developmental Biology (CDB), and the wonderful people that are part of it, over this past year.

2020 has been challenging in many ways given a viral pandemic raging worldwide, the social unrest and national soul searching triggered by tragic police brutality events in our country, and divisive politics. Like most other institutions across the country, the University of Michigan has been operating in a partial capacity since mid-March owing to the COVID-19 pandemic. The medical school and health system have turned on a dime to meet the challenges of caring for individuals infected with the COVID-19 virus. As I write these lines, we are experiencing a surge of new cases ahead of the winter months. But, we have adapted to these crises – magnificently so. Here in CDB we are learning new ways to fulfill our mission of discovery research, training, and teaching. And, just as importantly, we are learning new ways to strengthen our sense of community and make it more diverse, equitable, and inclusive.

The industry of our trainees and faculty has resulted in a plethora of publications reporting on significant advances in fields related to cell and developmental biology. This industry helped cement our position as the third-ranked department of its kind in the country for funding from the National Institutes of Health (NIH), an enviable position. Our two most recent additions to the primary faculty, Drs. Swathi Yadlapalli and Idse Heemskerk, each succeeded in obtaining substantive grant awards from the NIH, thereby contributing to the funding success. Partnering with the University’s Bioscience Initiative and the Life Science Institute, we recruited a new faculty member, Dr. Shyamal Mosalaganti, with expertise in the exciting field of cryoelectron tomography. Thanks to the efforts of several faculty led by Drs. Ajit Joglekar and Kristen Verheye, we launched a new, exciting and innovative graduate course, Quantitative Cell Biology, this Fall. Many of our students graduated with a PhD degree, and many of our postdoctoral trainees completed their training and left the department to continue on their professional journey. You can read about some of these accomplishments, and several others, in the newsletter.

While much uncertainty remains, the past few months have revealed an even deeper resiliency than previously realized in our department and community. I take this opportunity to extend a very special thank you to the departmental staff, in the admin office and laboratories, for their efforts to keep the department running while maintaining a safe and supportive environment. The trainees and faculty also deserve kudos for devising new ways to achieve progress in our activities. Like many of you, I am looking to 2021 with a renewed sense of hope and confidence in our potential as a department. Please stay engaged – your support means a lot to us.

Pierre A. Coulombe, Ph.D.
G. Carl Huber Professor and Chair
Introducing a new CDB course
QUANTITATIVE CELL AND MOLECULAR BIOLOGY

Over the last two decades, advanced technologies and quantitative analyses have become mainstays in cell and molecular biological research. Moreover, the focus of cell biological research has shifted to establishing deep connections between biological phenomena and biophysical and biochemical principles. Therefore, last year a team of faculty from CDB, Biophysics, and Biomedical Engineering came together to design a new course to introduce graduate students to new technologies, quantitative analyses rooted in biophysics and biochemistry, and computer programming. We unveiled this course (CDB 560) in fall 2020, refusing to let the Covid pandemic affect our plans.

The course incorporates individual modules that exemplify how key advances in molecular and cellular biology depend critically on quantitative methods and reasoning:

1. Introduction to programming using Python (lead: Ajit Joglekar)
2. Quantitative analysis of biological interactions (lead: Ajit Joglekar)
3. Protein structure (lead: Melanie Ohi)
4. Molecular basis of cytoskeletal organization (leads: Kristen Verhey, David Sept, Biomedical Engineering)
5. Membrane biology (lead: Sarah Veatch, Biophysics)
6. Signaling, cell fate, and patterning (lead: Idse Heemskerk)
7. Hypothesis generation using bioinformatic analyses (leads: Mara Duncan, Craig Johnson)

Each module spans two weeks and integrates the following principle elements:
(a) theory and foundational knowledge
(b) experimental design and techniques
(c) hands-on quantitative data analysis
(d) statistical inference.
The emphasis is on in-class discussions and group
problem-solving exercises designed to build mastery of basic concepts, methods, reasoning, and computational skills for modern cell biology. No prior training in Python or computer programming is required to attend the course.

The educational goals of the course are straightforward: we want to get biology students out of their comfort zone and open their eyes to the exciting and deep field of quantitative cell biology. We also want to give new students the basic training in quantitative analyses and Python scripting so that they can develop a quantitative analysis skill set over the next 4-5 years. This training and development will obviously help the students in enhancing their own research. I am also confident that quantitative analysis and programming skills will make CDB graduates competitive candidates for the Biomedical industry.

I have tremendously enjoyed teaching the first version of CDB560 this fall. Remote teaching in the time of Covid has presented us with some unique challenges. However, I am especially grateful to the first batch of 12 students, who have been extremely patient with us as we figure out the right balance of breadth and depth for this course. I am already looking forward to Fall 2021 to launch the next version of CDB560!
Welcome to the New CDB Faculty, Shyamal Mosalaganti

- Research Focus:
  Cyro-electron tomography, in-situ structural biology, lysosomes, membrane proteins

- Research Statement:
  Lysosomes are highly dynamic and multifaceted organelles that play a critical role in various intra and extra-cellular functions. Our team will employ in situ structural biology techniques to elucidate the principles that govern lysosomal function, positioning, biogenesis and how they engage in intra-cellular crosstalk with other organelles.

- Mentor Leader who inspires you?
  I owe a lot to my post-doctoral advisor - Dr. Martin Beck. A brilliant scientist with a great sense of humor. Always has time and patience to guide and support people in the right path.

- Favorite app on your phone?
  Twitter, ViVino

- Favorite Book?
  It is a long list to pick from. "The God of Small Things" by Arundhati Roy was one of my first favorites.

- Favorite place to relax or go on vacation?
  Algarve, Portugal or one of the Greek islands.
CDB students update

I am a first generation Latina scientist and my identity fuels me. When I was ten family circumstances resulted in my father working three jobs to maintain a roof over our heads and food on the table while I became the primary caretaker for my siblings who were one and three years old at the time.

Proudly, I am the first in my family to graduate high school let alone complete college and now be in a dual degree program (MD/PhD) at University of Michigan. I’m originally from Los Angeles and I started college at the local community college while caring for my family and trying to figure out my life goals.

After meeting Dr. Martin Diaz, my first mentor, he opened my eyes to a career in STEM and planted the seed of research in my head. Culturally, having an interest in science meant I could be a doctor or a teacher so up until that moment I was premised.

Thanks to his guidance I transferred to UCLA. The summer before officially starting the academic year, I was invited to apply to a summer undergraduate program. This was my first exposure to research. What was originally supposed to be an 8-week research program in Dr. David Walker’s lab ended up being 3 years of pursuing a better understanding of the biology of aging in the context of mitochondrial activity in fruit flies. It was my time in the Walker lab that really made me think critically about how much we don’t know about aging and it motivated me to pursue a Gerontology minor in addition to my Physiology Science major.

Armed with new knowledge of the bio-psycho-social factors that go into aging, I decided that I would pursue an MD/PhD program, but I had major imposter syndrome. I hoped I’d be a competitive applicant for a PhD program but I wasn’t sure if I had what it took to be in a dual degree program so I decided to apply to PREP programs to broaden my knowledge of biology of aging research and find the strength to believe in myself.

I knew I wanted the PhD, regardless of my path and applied during my PREP year to PhD programs that had strong cores dedicated to biology of aging research. This decision was further reinforced after meeting with Dr. Ron Koeng, the director of the University of Michigan’s MSTP program at the time, when he shared with me that first and second year PhD students were able to apply internally to the MSTP program. I made my decision then that I would apply to grad school and apply to MSTP during my first year of grad school and if I failed, I’d apply my second year and if I failed again, I would apply to med school after obtaining my PhD.

During my PREP year, Dr. Kate Barad was an amazing mentor to me and through the program helped fund a summer MCAT bootcamp for me. The support that I received from my new community at Michigan motivated me to purposefully invest in myself and not give into fear anymore. I decided to stay at Michigan for graduate school because of the amazing support. The staff, faculty, students, they all in some way really cared about me and my advancement, which empowered me.

I didn’t realize at the time how different CMB and CDB were when I was applying and actually joined the PREP program as an incoming CMB student but my heart was already with CDB. My PREP lab was a CDB lab and so I had already started to interact with the faculty and students and felt a belonging and didn’t want to lose that.

Jacqueline Graniel M.D.
PhD Student

I loved how close knit the people were and the ease in interacting with the department since it wasn’t as large as other programs. What I continue to love about CDB is their willingness to connect as a community and how responsive they are to the needs of the community.

I used to love all the Bar Louie social events CDB hosted and will greatly miss the holiday party and recruitment there but I’m excited for the creative ways we can still connect.

I’m not in a CDB lab yet I am a CDB student and I’ll always be grateful to Ben Allen for advocating for me.

My suggestion/advice for new CDB students is communicate. Communicate to your peers, to your mentors about what it is you need, how you feel and I bet you’ll find the support you need. I grew up thinking that my problems were my own and my struggles should be silent but I’ve grown the most during my time here at Michigan and I attribute that to embracing who I am and not being afraid to ask for help. While I’m not in a position of power (yet!) I’m happy to be here for anyone and fight for whatever it is you need.
My experience as a CDB postdoc

Jorge Martinez-Marquez
Research Fellow

- Tell us about yourself and your research interest
I was born and raised in the city of Caguas in Puerto Rico. I finished my undergraduate studies in Biology at the University of Puerto Rico at Cayey. I am the first from my family to acquire a doctoral degree, which I obtained from the Department of Cell and Developmental Biology at the University of Michigan. As a researcher from an underrepresented minority (URM) group, I feel very proud of accomplishing this goal of obtaining a PhD degree. Also, as an URM researcher, I feel the responsibility of sharing my experiences with the next generations of scientists to ensure a strong and diverse scientific community.

Generally speaking, I am interested in membrane trafficking. I am fascinated with understanding how the cell instructs certain anchored and integral membrane proteins to reach their location of action. At the same time, I am interested in understanding how these instructions are not followed by mutated proteins. Currently, I am studying the traffic of rhodopsin, which is the protein that detects light in the rod photoreceptor cells of the retina in the eyes.

- What was your experience in CDB and what is your favorite event at CDB?
The CDB Department offers a great environment where postdocs feel appreciated beyond the "postdoc appreciation week." I think one of the main reasons for this is the emphasis that CDB gives to the postdocs coming together in our own monthly meetings. This space pushes us to actually meet other postdocs and takes us out of our own lab "bubble" comfort zones. These monthly meetings enable us to bring forward any concerns we may have and provide a space for us to practice our presentation skills in a friendly environment. These have also provided space for career development discussion with faculty and other resources from the University.

My favorite events were the Annual Retreat, Summer Picnic, and Colloquiaums. Between those, I would have to pick the Annual Retreat since it combines the research networking and social networking aspects of the other two in a single event. The annual retreat is an event that I always look forward to, since I get to learn about all the research that is happening at the Department, while also catching up with my colleagues from the department.

- What is your success story
I am the first from my family to obtain a PhD. To get to where I am now, I first obtained a bachelor's degree in Biology at the University of Puerto Rico in Cayey. I then spent one year at the University of North Carolina at Chapel Hill (UNC) in a Post-Baccalaureate Research Program (PREP),
where I performed research and was provided with career development assistance for my next step - my goal of obtaining a PhD. Following my Prep year, I started my PhD training at UNC. During my PhD training, my mentor accepted a position at the University of Michigan. I decided to also move to Michigan, where I finished my PhD in 2018. Since then, I have been a postdoc in the lab of Jillian N. Pearring at the Kellogg Eye Center. Throughout all the milestones in my career I have had great mentors that ensured my success at each step. Importantly, I made sure to take advantage of many opportunities for (grants/proposals) available for URM researchers (ASCB, NIH, etc.) to further push forward my career.

- **What is your advice for new CDB postdocs?**
  Take advantage of the highly collaborative environment of the department. I would also encourage new postdocs to look for mentors among the faculty. Many, if not all, of the faculty members in the department are very open to speak to junior scientists to help push their careers forward. This includes things directly related to research (e.g. experiments, reagents, alternatives) as well as indirect aspects of postdoctoral careers, like career development and work-life balance.

- **Tell us about yourself and your research interest**
  I grew up in a small town outside of Boston that is famous for its yearly agricultural fair (one of the oldest in the country)!. Although both of my parents worked for the Department of Environmental Protection, I swore I would never become a biologist. But as an undergraduate at Haverford College, I developed a love for developmental biology. How does a single fertilized egg give rise to complex organs and, in particular, a functional nervous system? I returned to the Boston area to pursue my PhD in Neurobiology at Harvard University, where I used C. elegans genetics to study how neurons get the right shape and form appropriate cell-cell connections. I am now pursuing my interest in developmental neurobiology as a postdoc in Bing Ye’s lab. My previous work focused on how single cells develop. Here, I am studying neural development not at the level of a single cell, but rather at the population level. How do populations of neurons coordinate their development to establish a network that accurately encodes information as a collective?

- **What was your experience in CDB and what is your favorite event at CDB?**
  A highlight of my time in CDB came just before the shutdown, when I had the unique opportunity to attend a chalk talk by one of our faculty candidates. This experience gave me new insight into the academic track, yet I don’t know of other departments that allow postdocs to take part in candidate chalk talks. I am grateful to be part of a department whose leadership and admin team prioritize supporting the wellbeing and professional development of trainees, especially in light of the pandemic and newfound attention to anti-Black racism. I am thankful that CDB continues to grow and change in an effort to become a more supportive place for diverse trainees.

- **What is your success story**
  This past January, I had two unrelated papers from my graduate work accepted on the same day! One was a middle authorship from a collaboration. The second was a co-first author publication on my main project, describing interactions between two C. elegans neurons and their partner glial cell. (The C. elegans lineage is so invariant that we can give each cell a name and study the same exact cell-cell connections across many animals!) We identified two highly conserved genes that are required for these neuron-glial connections. Interestingly, both genes are also found in epithelial cell-cell adhesion complexes, consistent with the idea that the nervous system evolved from epithelia.

- **What is your advice for new CDB postdocs?**
  I have two pieces of advice. First, fill out an Individual Development Plan (IDP) when you first arrive at U-M. Don’t treat this as more paperwork! Rather, use it as the basis for a productive conversation with your PI about goals and expectations for your time here. CDB requires a yearly IDP, and I have greatly appreciated the incentive for reflection and honest dialogue. Second, get involved in the postdoc community in CDB and beyond. Forming relationships with colleagues outside my lab has been such a joy! The transition from grad student to postdoc can be a challenge, but it is made better by the supportive community we have - you just need to plug into it.
Alumni Update

This year and in the middle of the pandemic, we had an opportunity to catch up with two of our alumni, Briana Dye & Brandon Carpenter!

BRIANA DYE
ASSISTANT SCIENTIFIC DIRECTOR AT PROED COMMUNICATIONS (MEDICAL WRITER)
MENTOR: JASON SPENCE
GRADUATED IN 2016

- What is your current job and title?
Assistant Scientific Director at ProEd Communications (medical writer)

- What do you do on a typical day?
My typical day moves quickly with deadlines fast approaching on various projects and meetings with clients (pharma both global and US) and leaders in the field. My work focuses on CAR-T cell therapy for patients with leukemia or lymphoma. I work on variety of projects including educational material for healthcare professionals, manuscripts reporting on the latest clinical trial results or specific topics such as management of toxicities or key biomarkers, comprehensive reviews, and presentations/posters for meetings and symposia for healthcare professionals. We also help our client strategize their publication plan such as what are the gaps in the field and what are competitors focused on.

- What do you like most/least about your job?
I like the strategizing part of my job on how best to present the material. All the material I work on has an indirect impact on patients. For instance, I have worked on presentations and manuscripts that will impact how physicians

manage adverse events in patients treated with CAR-T cell therapy. Overall, my goal is for patients to gain access to the latest therapy which means increasing awareness to healthcare providers to refer patients in addition to increasing the number of centers that can provide CAR-T cell therapy to allow for easier access globally. The least favorite part of my job is the paper trail part of it. I have to fill out my hours under different job codes for each project. And for drafts to move forward we need all authors’ approval. Good news is we have client services who takes care of timelines and client emails, thank goodness!

- What do you wish you had known when you were a grad student?
When I was a grad student, I truly enjoyed being in the lab doing research. However, even in the academic environment, I didn’t realize my passions didn’t line up with being a PI. I was driven by my competitive spirit of trying to reach the ultimate academic position instead of realizing what I truly enjoy. My career now allows me to easily move to other scientific fields and engage in different types of work other than medical pubs including regulatory, commercial, startups. Overall, the opportunities seem endless. There’s definitely an exciting scientific world outside of academia!

- Anything else you would like to share?
The career I am in now is very flexible for work-life balance. Most if not all job opportunities as a medical writer can be remote, which helps with starting a family and not making your family move if you switch jobs. Also, I did a ton of informational interviews to figure out what is best for me. Don’t be afraid to reach out to whoever on LinkedIn and get to know about their career. I would definitely do this well before you go on the job market. Lastly, GO BLUE!
- What do you like most/least about your job?
I love mentoring! The best part of my day is watching students make breakthroughs in their research and become inspired by the science. The worse part for me is still feeling like I am living like a graduate student...which isn't terrible by any means! Because postdocs are short, it is hard to commit to buying a house and becoming part of the community when you know you are only there temporarily. The academic track is a long one and I am ready to settle down.

- What do you wish you had known when you were a graduate student?
The most important advice I can give a graduate student is to find a mentor who will teach you how to become a critically thinking scientist. The science isn't as important as finding a PI who cares about you and is invested in your future. Worry about the science when you are a postdoc! Also, I wish I would have known how long it takes to actually get a manuscript to press. From putting the first figures together to getting it published, it takes well over a year, and if I had really internalized this as a graduate student, I would have worked a little more efficiently...Sorry Ben Allen!

- Anything else you would like to share?
My passion for mentoring the next generation of scientists keeps me motivated through the tougher aspects of the academic career path. When I burn out at the bench, I re-fuel by witnessing my mentees succeed. If I can give a little more advice to graduate students and early postdocs it would be to make sure you love what you are doing, and that you find your passion. If you do, then all the work you put in will be worth it. I identified my passion for teaching and mentoring while I was a graduate student in the CDB Program. Ben Allen, the CDB department, and the University of Michigan provided the pedagogy training, TA opportunities, and professional development that allowed me to take this passion to the next level. Finally, I can't stress enough that there are lots of career options out there outside of academia, so get yourself connected and spread your network as wide as you can through conferences, social media, and job sites. This has been critical to my success and is paying dividends as I navigate the academic job market.

CDB ALUMNI?
WE WANT TO HEAR FROM YOU! SEND US AN EMAIL AT CDBINFO@UMICH.EDU
Discovering the new generation of Biologists!

Developing Future Biologists (DFB) began in 2015 when Andrea Ramos, a UM graduate student working in Scott Barolo’s lab, conceived the idea of bringing the resources available at the University of Michigan to her home of Puerto Rico. She envisioned an organization that could provide hands-on research experience in developmental biology to students in Puerto Rico who did not have access to these opportunities. To make this idea a reality, she assembled the founding DFB team, composed of herself, and four other grad students in CDB labs: Brandon Carpenter, David Lorberbaum, Justine Pinskey and Martha Echevarria Andino. Andrea also recruited four CDB faculty, Drs. Ben Allen, Scott Barolo, Deneen Wellik and Deb Gurnucio to help develop the course. For two years, DFB instructors traveled to Puerto Rico to engage undergraduates in research and expose them to careers in STEM. In 2017, the course moved to Ann Arbor where students from around the country, including a significant number from Puerto Rico, traveled to UM to experience research at a top university. Despite changes over the years, the mission of DFB remains the same: to ensure that the next generation of biologists, regardless of race, gender, or socioeconomic status, can learn core biology concepts and be made aware of the many opportunities to pursue a career in science. Since its inception, DFB has engaged with over 145 students, many of whom are now pursuing the next stage of their scientific careers.

- DFB students’ successful story
Choosing just one student out of the 145 DFB participants is an impossible task. Each student is unique and successful in their own ways. In thinking about where DFB is headed, one student that comes to mind as a DFB ambassador is Nayanna Mercado-Soto, a 2018 DFB alumna. Then a junior from the University of Puerto Rico at Mayaguez, Nayanna had no previous research experience but was highly enthusiastic and eager to learn. Based on her exceptional performance in the 2018 course, Nayanna was invited to return in 2019, where she served as the first DFB Teaching Assistant—her perspective as a DFB alum proved invaluable in engaging students throughout the course. Nayanna then remained at UM to conduct research in Dr. Ben Allen’s lab, work that she later presented at the Annual Biomedical Research Conference for Minority Students (ABRCMS) in a poster titled “Investigating the Role of Hedgehog Signaling in the Pancreatic Cancer Microenvironment.” Since her involvement with DFB, Nayanna has continued to excel. She is currently a PREP scholar at the University of Michigan and is applying to graduate school as we speak.

- Challenges in the COVID-19 situation
We originally planned to bring students from across the U.S. and Puerto Rico to UM for the 2020 iteration of DFB. However, the COVID-19 pandemic and ensuing research ramp-down rendered this impossible. Impressively, the DFB Team adapted the course to a virtual format, integrating several tech platforms to deliver course content, including the virtual lab simulator Labster. To ensure that all student could fully participate, we provided laptops to students in need. An unexpected benefit of the virtual format was that we were able to have panels featuring many diverse speakers across the U.S. that would not have been possible if the course were held in person. To maintain the hands-on components so crucial to our course, we also sent each student a lab kit to conduct experiments in their own homes. These kits included USB-powered and foldable paper microscopes, prepared slides of blood smears, live Planaria flatworms, live Drosophila melanogaster (wild-type and mutants) and other necessary supplies. Despite the many challenges facing our students, they successfully learned core developmental biology concepts, engaged in career development activities, and networked with both their fellow classmates and outside panelists.

- DFB future plan
The DFB Team is hard at work planning the 2021 course, whether it be virtual or in-person. We will continue to expand our program to reach even more students in the next year. In the meantime, we are working on several exciting new initiatives to engage DFB alumni and provide them with further opportunities to advance their careers in STEM. These include: (1) Conference Attendance Awards to lower the financial barriers of attending scientific conferences, and (2) Summer Research Fellowships for a longer and more in-depth research experience in a UM lab. Both serve to fulfill our mission to inspire students to pursue science beyond our one-week course.
The 2020-2021 Instructors

Senior Instructors (from left to right): Anna Shirazy, Tyler Hoard, Kaylee Steen, Angela Guo, Samantha Kemp.

Junior Instructors: Jessica McAnulty, Becky Glineburg, Matt Schnizlein, Jackie Granier, Krista Armbruster, Mirella Hernandez-Lima

The Teaching Assistants: TAs Nhi Vuong and Paola Medina-Cabrera

The Faculty: Ben Allen, Scott Barolo, and Laura Buttilta
A VIBRANT CELEBRATION OF BLACK MICROBIOLOGISTS

Chelsey Spriggs has always been interested in science. She explained that she has always been one of the few Black scholars in the departments and programs she has been a part of throughout her career. Through her connection with Dr. Kishana Taylor, and their realization that many Black scholars felt similarly about their experiences, Black in Microbiology was formed. Black in Microbiology has connected Black scholars across the globe, and, given them the chance to share their accomplishments. Take a moment to check out this article about Black in Microbiology, and how it originated. The article was featured in the New York Times!

**Chelsey Spriggs, Ph.D.**: Growing up, I was always interested in science. I loved the scientific process and even won the Detroit City Science Fair as a high school freshman! This gave me an opportunity to participate in the International Science and Engineering Fair where one thing became clear; I was way out of my league. Students had professional presentations with experiments that were performed in university laboratories. Not in their basements with help from their moms. This didn’t seem like the sort of place where I belonged, solidified by the fact that no one really looked like me. By the time I entered college, I thought that the only available STEM careers were medicine or veterinary medicine.

Even after participating in undergraduate research, I never considered becoming a scientist, and had no idea that graduate schools in biomedical research existed. Thankfully my mentor encouraged me to apply and helped me through the application process. Throughout my entire career, I have always been the only, or one of few, Black scholars in my programs and departments. It was not until last year that I met another Black female virologist, Dr. Kishana Taylor, at a conference where we realized that this is a common experience for most Black scientists.

When she messaged me this summer to ask if I wanted to help organize an event aimed at connecting Black microbiologists, showcasing our accomplishments, and amplifying our voices in STEM, I knew that I had to be a part of it! She reached out to others that she knew and put out a call for help on Twitter and Black in Microbiology was born!

**Ariangela Kozik, Ph.D.**: I am currently a postdoctoral research fellow in the division of Pulmonary and Critical Care. I work in the laboratory of Dr. Yvonne Huang to understand how the respiratory microbiome is involved in the presentation and pathogenesis of asthma. I also serve as the Chair for the Postdoctoral Family Association and the President of the University of Michigan Medical School Postdoctoral Trainee Senate.
were dedicated to the vision.

Black In Micro Week was an overwhelming success. We have established a vibrant community and formed many positive relationships with scientific organizations, departments, and others. We are working hard on future programming and other organizational goals, and we look forward to our future. Black In Microbiology is here to stay!

Filipe Cerqueira, B.S.: Born in Bahia, Brazil. I immigrated to Texas when I was 7. I graduated from the University of Texas at Austin in 2017 where I majored in Microbiology. I also took courses in social justice education and practiced the art of effective facilitation to engage with STEM colleagues about diversity and inclusion. I joined PIBS in 2017 and joined the Koropatkin Lab in 2018 where I am studying starch-active proteins from bacteria in the human gut microbiome. I was on the programming committee of Black in Micro which means that I played a part in the creation and execution of the events for the week. I also was a facilitator for two events: a Q&A with Black scientists about COVID-19, and a talk about how the Black queer community is impacted by the HIV global pandemic.

Filipe Cerqueira, Ph.D. Student, Department of Microbiology & Immunology at the University of Michigan Medical School

Earlier this spring and throughout the summer, there were many movements formed in the wake of continued racial inequality and violence. In the academic community, this included Shut Down STEM, Black Birders Week, and others that gathered a coalition of scientists and STEM professionals to speak out more openly about the challenges faced by their Black colleagues and to amplify the presence of Black scholars in their fields.

I, along with Dr. Kishana Taylor (a postdoctoral scholar at Carnegie Mellon) were very encouraged by the ‘Black In _____’ movements that we were seeing and felt that we needed to start the movement within Microbiology. In the context of a pandemic with disproportionate impacts on the Black community along with widespread misinformation about microbiology, we felt a sense of urgency. About a week after officially making the decision to start BlackInMicro Week, we had our first organizing meeting. We ended up with a team of approximately 30 people from all professional levels and subfields in microbiology, including fellow UMich postdoc Chelsey and UMich doctoral student Filipe. Over the next few weeks the vision and programming took shape. We were very fortunate to gather such a PHENOMENAL group of organizers and volunteers that
Black in Micro was a unique opportunity to connect Black microbiologists from around the globe. Concentrating Black scholars into one space led to an exceptional transaction of science and mentorship, emphasizing the great loss due to the on-going exclusion of Black people from science. Black in Micro is a small glimpse of what can be accomplished when Black people are not only included but celebrated for their intellect, expertise, and talent.

---

**Story from CDB Admin team working at COVID-19 situation**

*By Brian Rogers*

---

**We're coping!**

We use individual skill sets, but we are coping very nicely with the new normal of working at home.

**Tamika Mohr** calls the experience “a mixed bag of the most epic proportions.” She struggles daily to make sure her four-year-old and two-year-old have the attention they crave while she meets the expectations of her job. “I consider myself to be technologically savvy, but this challenge has forced me to up my game,” she says. On a positive note, she is glad her children have had the opportunity to observe how she meets the needs of her family while managing a career.
In the early stages of the pandemic, Brooke Lorigan liked having more time at home with her fiancé and her dog, however, she misses the social interaction of being in the office with co-workers. “There is a certain energy,” she says, “the work environment brings that does not exist at home.” Something Brooke does NOT miss is the UM parking situation.

Brittney Longeway was already working from home two days a week and had a nice set up at home, but things quickly got very busy. “I found myself working a lot more hours in one day than I typically would if I was working in the office.”

Kristen Hug notes that, before COVID19, working from home was a luxury. She had the house to herself two days a week and thoroughly enjoyed the silence. Add home schooling of her two sons, and the challenges have been many, but, she says, “I can appreciate the rewards.”

Lori Mirabitur at first loved not having to get up at 4:30 a.m. and drive to Ann Arbor from Livonia or her lake home in Brighton, yet she misses her co-workers. “They are my second family,” she says. But “thank God for Zoom, or I would be lost. I enjoy our happy hours, staff and faculty meetings,” she adds.

Annette Klomparens says, “When COVID first hit and we were all locked down, it was scary. No one knew what the future would hold and how long this would last.” The experience has given her and her husband an inkling of what the future will hold when they retire. She is glad the lockdown is relaxing a bit and they are able to go to restaurants and visit their two children, and three grandchildren.

Karen Lang recalls that when COVID first hit, “I assumed it would not impact us for long and remember leaving work with the idea we would be back in two weeks. Then reality hit when the UM ramped down the labs.” Karen hopes that someday soon, life will get back to normal. “In the meantime,” she says, “we are making the best of it.”

Mohi Shakibafar points out that COVID-19 brought a lot of challenges and issues for families with little kids, such as his own, however, with the challenges came opportunities to learn a lot of positive things. He concludes with a commonly shared sentiment: “Go Blue!”

Deontae Hooks is taking our new way of life day by day; and while everything else is going on, he is planning his wedding for August 2021. He has already pared the guest list by 100 people.
I am a cell biologist, and have directed a basic research lab for 13 years. For 10 of these years (2007-2017), I was on faculty at Vanderbilt University. I have been at the University of Michigan since 2017. My lab studies mitosis, the process by which eukaryotic cells pass their genetic blueprint on to their daughter cells. This process has fascinated me for decades because its proper execution requires precise coordination of many cell machineries. Indeed, the cytoskeletons of the cell (microtubules and actin) are leveraged to engage and move many cellular structures, most notably chromosomes and the cell cortex. The choreography of cell division is accomplished by signaling pathways that act on a time scale of seconds. The dynamic nature of cell division also makes it beautiful to watch. After 30 years, I still get excited by observing cell division through a microscope. Lastly, my strong commitment to studying mitosis is galvanized by its relevance to human health: failures during cell division cause many human pathologies, including infertility, congenital birth defects, and cancer. Knowledge of the workings of mitosis can also lead to the development of valuable tools to stop cell division when it is deemed necessary, for example, in cancer patients.

The study of cell division has a long and distinguished history. In the late 1800s, the German cytologist Walther Flemming described the process in detail through an analysis of fixed specimens, and his work is summarized in the seminal book Zellsubstan, Kern und Zelltheilung. Interest in the mechanistic underpinnings of mitosis has not subsided, and the field is now large and thriving. In part, this is because modern studies of cell division are sophisticated, and rely on a broad spectrum of technical innovations, ranging from high tech microscopes, to genetic engineering methodologies and proteomics. Mitosis has also become a favorite study of theoreticians, because first principles in physics and chemistry may be sufficient to explain many fundamental aspects of cell division. Lastly, mitosis is a robust target for therapeutic development.

In the 1970s, biomedical researchers discovered that tubulin-targeting anti-mitotic natural products, e.g., taxanes and vinca alkaloids, were potent anti-cancer agents. Chemical biologists are now working to identify anti-mitotics that work by targeting proteins specifically involved in cell division, as such agents may have reduced toxicity relative to tubulin poisons. Indeed, the tapestry of mitosis that scientists have woven over the last 120 years is complex and beautiful. How does one establish and sustain a research program in such a venerable field? I believe the answer to this question involves thinking differently than other researchers in the field. Only then will it be possible to identify (and answer) questions that are unique and timely. In the remainder of this essay, I will try to identify key elements of my past experiences that have helped me to build a unique research program, with a focus on the intersection of music and science.

My parents are from Japan. They came to the U.S. in the early 1970s because my father carried out his Ph.D. in the Department of Biology at Princeton University. From an early age, my parents urged my siblings and I to take up music, and we all learned how to play violin. Music and science were a major part of my adolescent life. I remember performing experiments to test the effect of different toothpastes on the growth of bacteria scraped from my teeth, and then heading off to violin lessons. Indeed, the pursuit of music provided structure in my life. I learned at an early age that it takes a long time to accumulate the skills to be good at a craft. But perhaps more importantly, music taught me focus, and the ability to connect seemingly disparate parts of my brain.
Certain melodies would cause me to dwell in specific memories. Others would inspire new ideas. Some had a meditative quality, causing my mind to go completely blank, and just be present in the moment. Remarkably, all of these cerebral experiences could be communicated to others through the physical action of playing an instrument.

As my skills increased, so too did the effectiveness with which I could communicate my thoughts and feelings. Participation in symphonies and orchestras caused an equally remarkable epiphany. I was able to connect with my section, with the goal of making tens of instruments sound like 1. Broader yet, my section would communicate with other stringed, woodwind or brass instruments. What a rush!

College came with transitions. Science became a central focus in my life, and I opted to play an electric bass in a rock band instead of a violin. The switch was appropriate for my more rebellious nature at the time. Guns and Roses and Pearl Jam felt more natural than Mozart and Beethoven. While rock music is perhaps less sophisticated than classical music, the experience was equally enriching. There is nothing like the wordless conversations that take place between an audience and a band on stage - it is a positive feedback loop at its best.

Mirroring my musical activities, I found myself drawn to cutting edge areas of research that burstled with energy. I found myself in a young (at the time) lab that studied cell cycle control. Cdci2 had just been discovered to be a universal driver of the cell cycle, and the field was ablaze seeking to identify other proteins that played key roles in cell cycle control. This research area connected signaling, the cytoskeleton, and chromosomes in ways that I hadn't been taught in my undergraduate classes. Naturally, there was space in this burgeoning field for new thinking and raw energy. I was hooked, and studied cell cycle control as a graduate student. Unfortunately, music then took a back seat in my life for nearly 20 years. However, I benefitted from the foundation that my music education had established. I found myself capable of making connections between what seemed to be disparate areas of knowledge, and found comfort working in these less well characterized spaces.

For my post-doctoral work, I chose to train with Dr. Tim Mitchison at Harvard Medical School. Tim is well known for thinking unconventionally, and is knowledgeable in many areas of biology, chemistry and physics. As I aspire to do, Tim deftly wields his broad knowledge to raise questions that few are able to. His style of doing science is as unique as art and music.

Music entered my life again -5 years ago. It was my son, Calvin, who encouraged me to start playing music again. He is a mandolin player with jazz and bluegrass inclinations. When he first started playing, he would ask me to tune his instrument. I happily did this, but would go on to play his mandolin for long periods of time. Violins and mandolins are tuned in the same way, so it was natural for me to have basal skills in playing the mandolin. Ultimately, Calvin grew tired of me playing his instrument, and he suggested that I buy my own instrument. At 45, I picked up the guitar, with the goal of developing songwriting skills. Learning how to play the guitar was, and continues to be, difficult. By comparison, songwriting, and playing and singing at the same time proved nearly impossible. It took ~1 year of practicing 5-6 hours a day to uncouple my hands from my voice! My career and background in music gave me the patience, focus, and knowledge to acquire musicianship in an area that was new to me. Today, I enjoy playing solo ‘coffee-shop’ style gigs, and also perform with the rock band Mad Pursuit.

How has music prepared me for a career in science? Music allows me to express my ideas and emotions in ways that words and science cannot. Similarly, science is, in part, a form of expression for me. I tend to work on problems that are aimed at overturning convention, or that give rise to a new understanding of biology. As an individual, the ability to emote using multiple forms of communication is helpful to me. Second, the pursuit of music reminds me that mastery of a specific skillset takes dedication, commitment, and lots of time. Obviously, this is also true in science. Indeed, answers to questions sometime take decades of research. Lastly, music has prepared me to connect seemingly disparate ideas and facts. These connections are often made in times least expected. As I mentioned above, the ability to think differently is critical to success in biomedical research today. In my opinion, any activity that promotes innovative thinking is valuable, and should be practiced on a regular basis. For me, that is music.
FACULTY HONORS & AWARDS

Maria Castro
- Named a Fellow of the American Association for the Advancement of Science (AAAS)
- Elected as member of the Latin American Academy of Science based on their outstanding contributions to research and innovation

Jianping Fu
Promoted to Professor in the Department of Cell & Developmental Biology

Deb Gumucio
- Awarded the American Gastroenterological Association's Morton I. Grossman Award, in recognition of outstanding research related to the discipline of gastroenterology
- Awarded the Michigan Medicine Alumni Society Distinguished Service Award

Michael Hortsch
Guest editor for a special collection of articles in FASEB BioAdvances written by leaders in biomedical education which showcase some central aspects and paradigm-shifting developments of this quickly evolving field

Jiandie Lin
Recipient of the American Diabetes Association (ADA) 2020 Outstanding Scientific Achievement Award

Pedro Lowenstein
Elected as member of the Latin American Academy of Science based on their outstanding contributions to research and innovation

Marina Pasca di Magliano
Promoted to Professor in the Department of Surgery and in the Department of Cell & Developmental Biology

POSTDOCTORAL AWARDS

Clarissa Durie
OMI, M Lab
Chosen as a HHMI Leading Edge Fellow

Chelsey Spriggs
Tsal Lab
- Selected as a 2020 Cornell University Rising Star, a program that provides “individuals with the opportunity to polish their skills in preparation for seeking faculty positions”.
- Recipient of the prestigious 2020 Burroughs Wellcome Fund Post-doctoral Enrichment Program Fellowship.
- Featured in an article in the New York Times, Black Microbiologists Push for Visibility Amid a Pandemic. She is the Black in Microbiology sponsorship team lead

Nina Steele
Allen and Pasca di Magliano Labs
- Won the Short Talk at the S1 Annual Moses Gunn Research Conference in Ann Arbor
- Won the Short Talk at the Pancreatic Cancer Symposium in Toulouse, France
- Invited as Teaching Assistant for a CSHL workshop on Pancreatic Cancer
- Won the Short Talk at the AACR Annual Meeting, Mini-Symposium on Innovative Approaches and Tools to Study the Tumor Microenvironment
- Selected participant for Building Up Pipeline for Diverse Biomedical Research Faculty
- Received the Company of Biologists Travelling Fellowship Award
- Selected participant for You3 Postdoctoral Leadership and Management Program

Dan Schill
O'Shea Lab
Appointed to the Medical School Postdoctoral Senate
Breane Budaitis
Varkey Lab
Defended her Ph.D. Thesis

Alyssa Miller Caddick
Spence Lab
Defended her Ph.D. Thesis

Renee Conway
Spence Lab
Awarded an NIH Predoctoral Fellowship

Martha Echevarria
Allo Lab
Defended her Ph.D. Thesis

Amanda Erwin
Oh, M Lab
Defended her Ph.D. Thesis

Jaclyn Fingerhut
Yamashita Lab
Defended her Ph.D. Thesis

Emily Freeburne
Hawkins Lab
Awarded a spot in the Cellular Biotechnology Training Program

Jacqueline Graniel
Narashkumar Lab
Won best talk in the Cellular & Molecular Biology discipline at the 2020 SACNAS National Conference

Mara Harwood
Tsoi Lab
Awarded a NIH F31 predoctoral fellowship

Fatima Javed
Pant Lab
- Awarded an American Heart Association (AHA) Predoctoral Fellowship
- Selected as a fellow for the Yale Science Academy

Rafi Kohen
Giger Lab
Defended his Ph.D. Thesis

Henry Kuang
Lin Lab
Received an EBS Excellence in Basic Science Award

Hao Liu
Cai Lab
Defended his Ph.D. Thesis

Flor Mendez
Consortium Lab
Defended her Ph.D. Thesis
**Rosa Merivar**  
*Pasca di Maglano Lab*  
- Elected as Vice President of SACNAS (Society for Advancement of Hispanics/Chicanos and Native Americans in Science at the University of Michigan Chapter)  
- Awarded the 2020 CMB Student Service Award

**Nafisa Nuzhat**  
*Pebring Lab*  
- Awarded a training fellowship from the UM Center for Cell Plasticity and Organ Design

**Chris Pineda**  
*Coitanoz Lab*  
- Elected as Communications Chair of SACNAS (Society for Advancement of Hispanics/Chicanos and Native Americans in Science at the University of Michigan Chapter)

**Kenny Trieu**  
*Wong Lab*  
- Awarded a NIH F31 predoctoral fellowship  
- Awarded a Rackham Graduate Student Research Grant

**Ashley Velez**  
*Pasca di Maglano Lab*  
- Selected as a Scholar for the 2020 Scientist Mentoring & Diversity Program for Biotechnology (SMDB Biotech)  
- Awarded a NIH F31 predoctoral fellowship  
- Won best talk in the Cancer Biology discipline at the 2020 SACNAS National Conference in October.

**Bridget Waas**  
*Allan Lab*  
- Awarded a training fellowship from the UM Center for Cell Plasticity and Organ Design

---

**Image: Give Me Air**

By: Ramee Conway, Graduate Student (Spence Laboratory), Department of Cell and Developmental Biology, University of Michigan Medical School

This image shows a cross-section through the embryonic trachea, commonly known as the windpipe. This is the tube through which air enters the body and reaches the lungs. Each gray dot is the nucleus of a single cell. The cells outlined in blue are the cells that line the trachea, and the cells marked by green make up cartilage, the hard rings you can feel if you touch your throat. Interestingly, the different cell types in this image actually communicate with one another, using molecular messengers to guide the proper formation of a functional trachea. The pink dots represent specific messenger RNA molecules that are part of this cellular communication process. In the condition known as tracheomalacia, the cartilage component of the trachea fails to properly develop and this weakens the walls of the trachea, proper, causing them to collapse. Tracheomalacia can also develop in people who have been intubated for prolonged periods of time, a new worry in this age of COVID-19. For more information please visit: biocartography.com
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:

- Ph.D. student education supported by gifts to the Bradley M. Patten Memorial Fund (795360)
- Postdoctoral student education supported by gifts to the G. Carl Huber Postdoctoral Fellows Fund (300450)
- Bold, innovative science supported by gifts to Watching Molecules at Work: Building Technologies for the Future (324124)

**Giving**

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

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](http://www.umichcdb.com).

Thank you for considering!