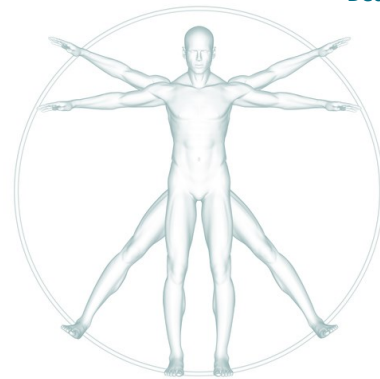




Molecular & Integrative Physiology



MESSAGE FROM THE CHAIR



Dear Friends,

The legacy of our Physiology Department continues with 134 years and counting. I wish to take this opportunity to highlight some of the activities of our faculty and trainees in education, research, and outreach. In terms of faculty, we were very fortunate to recruit Dr. Ling Qi, from Cornell University, as Professor of Physiology and Medicine/Division of Metabolism, Endocrinology, Metabolism and Diabetes. Ling is an internationally-renowned expert in protein folding and he has already established collaborations with several faculty at the U-M. On the educational front, our PhD and MS programs continue to flourish. Sue Moenter and Dan Michele are gearing up for the upcoming PhD recruiting season during Jan/Feb 2017. Kudos to Sue for organizing a department PhD Program Workshop, with terrific input from our PhD students and faculty, that concluded with specific recommendations that will not only enhance some of our course offerings but also improve the career development of our students. Congratulations are also in order to our PhD students who have secured a wide range of fellowships and other recognitions, and to Devika Bagchi and fellow students, who organized our department’s first community outreach effort at Wiley Elementary School . The MS program is now in its sixth year and includes 34 students who are looking to become physicians, dentists or scientists; two MS students from class V were selected for the MS Altshuler Scholarship. The undergraduate summer research programs continue to thrive and grow (now up to 45 students), because of the hard work and passion that Santiago, Jimo, Ormond, Dan and Yatrik have put into them, with a special thank you to Michele Boggs, who has administered the programs over several years. Another cornerstone of our educational and research missions is postdoctoral training. MIP’s Postdoctoral Society (overseen by Elise, Nicole and Mark) is active and Yatrik Shah started serving this year as its faculty advisor. This newly-created MIP role provides further mentoring, instituted postdoctoral recognition (e.g., our first postdoc symposium), and provides other opportunities such as teaching.

Our NIH research portfolio ranking is projected to place us 1st nationally for US physiology departments, the highest ranking we have received. While this ranking is nice and we have been working to move to the top, our foremost priority is to provide a supportive and nurturing, yet exciting, scientific environment for all our students, trainees, faculty and staff. It is this collaborative environment that allows our department members to achieve excellence.

To our alumni and former co-workers and colleagues, I hope you will stay in touch and visit us or browse our website, medicine.umich.edu/dept/molecular-integrative-physiology. It is an honor and privilege for me to be part of MIP and on behalf of our department I wish to thank everyone who has given so generously to our fund-raising efforts. Philanthropy provides critical resources to our research and educational efforts, be it providing travel awards and scholarships to our students or allowing our faculty to pursue risky or out-of-the-box experiments that standard support venues would not consider.

In closing, I am very thankful to Sarah Lawson for her hard and creative work in assembling this annual Newsletter and to all who have contributed to its sections.

With very best wishes for the holiday season and a healthy, happy and fulfilling New Year,

Bishr Omary

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FACULTY HONORS & AWARDS 2016

Charles Burant - Associate Editor, *Diabetes*

Christin Carter-Su - Piero P. Foa Endowed Lecture, Department of Physiology, Wayne State University; Aspire, Advance & Achieve Mentoring Award, University of Michigan

Roger Cone - National Academy of Medicine; Scientific Advisory Board of the Keystone

Symposium; Awarded Obesity Society's TOPS Research Achievement Award; Phi Beta Kappa commencement address at Vanderbilt University

Justus Anumonwo - AHA Young Investigator Award for Excellence

Carol Elias - Clinical Research Fellowship Mentor Award - Mentorship of Erica Mahany in Endocrine Research. Supported by Pfizer, Inc. - Endocrine Society

Thomas Gardner - Associate Editor, *Diabetes*; Associate Editor, *Clinical Diabetes and Endocrinology*; Eva Kohner Lecture, European Association for the Study of *Diabetes Eye Study Club*; Retina Research Foundation Jules Gonin Prize, Club Jules Gonin; Keynote Lecture, Swedish Ophthalmological Society; Keynote Lecture, NEURODIAB Meeting

Malcolm Low - Rackham Distinguished Faculty Achievement Award

Carey Lumeng - Associate Editor, *Diabetes*

Costas Lyssiotis - Editorial Board, *Gastroenterology*; Lefkofsky Family Foundation Scholar; Sidney Kimmel Foundation Scholar Award; American Gastroenterological Association Augustyn Award in Digestive

Cancer; Melanoma Research Alliance Young Investigator; The V Foundation Junior Scholar Award

Ormond MacDougald - Adjunct Professor, Department of Biochemistry and Molecular Biology, University of Southern Denmark; Associate Editor, *Diabetes*; Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award, American Physiological Association

Daniel Michele - MICHR Distinguished Clinical & Translational Research Mentor Award; Eleanor and Larry Jackier UM-Israel Collaborative Research Award

Martin Myers - Editor in Chief, *Diabetes*

Bishr Omary - American Physiological Society, Horace Davenport Distinguished Lectureship; Abo Akademi, University of Finland, Adjunct Professor; CIMG NIH Study Section

Donald Puro - Research to Prevent Blindness Stein Innovation Award

William Rainey - ICER NIH Study Section

Linda Samuelson - Lyman Briggs College Distinguished Alumni Award, Michigan State University

Yatrik Shah - Cozzarelli Prize, PNAS for published paper reflecting scientific excellence and originality

Santiago Schnell - President, Society for Mathematical Biology; Editorial Board, *Current Opinions in Systems Biology*; Editorial boards of *Cancer Research and Biophysical Chemistry*; Member, STRENDA (Standards for Reporting Enzymology Data) Commission

2016 Physiology Faculty (and Reigning CHAMPIONS - Faculty/Student 2016 Softball Game!!)



First Row: (L to R) Richard DeFazio, Jimo Borjigin, Christin Carter-Su, Lisa Larkin, Bishr Omary, William Rainey, Louis D'Alecy, Lei Yin, Liangyou Rui **Second Row:** Edward Stuenkel, Linda Samuelson, Susan Brooks, Lawrence Argetsinger, Costas Lyssiotis, Ormond MacDougald **Third Row:** Jun Hee Lee, Anatoli Lopatin, Amy Oakley, Pilwha Lee, Suzanne Moenter, Suzanne Mandrup, Brian Carlson, Ling Qi **Fourth Row:** Daniel Michele, Ranjan Pradhan, Hiroyuki Mori, John Williams, Shawn Xu, Elizabeth Rust, Yewei Ji, Carol Elias **Fifth Row:** Scott Leiser, Timothy Houchin, John Williams, Scott Pletcher, Santiago Schnell, Howard Crawford

WELCOME NEW FACULTY



Roger Cone
Professor
Molecular & Integrative
Physiology;
Mary Sue Coleman Director of LSI



Subramaniam "Sub" Penathur
Joint Associate Professor
Internal Medicine/Nephrology;
Molecular & Integrative
Physiology



Suzanne Mandrup
Adjunct Professor
Molecular & Integrative
Physiology;
Biochemistry and Molecular
Biology, University of Southern
Denmark



Ling Qi
Professor
Molecular & Integrative
Physiology;
Internal Medicine/ Metabolism,
Endocrinology & Diabetes

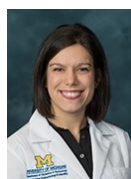
CAREER MOVES



Beatriz C. Borges (Elias Lab)
Instructor
Department of Physiology
University of Sao Paulo



Elisa Na (Low Lab)
Assistant Professor
Department of Psychology
Texas Woman's College



Erica Mahany (Elias Lab)
Assistant Professor
Obstetrics & Gynecology
University of Michigan



Rui Xiao (Xu Lab)
Assistant Professor
Department of Aging & Geriatric
Research
University of Florida

FACULTY PROMOTIONS



Justus Anumonwo, PhD
- *Associate Professor* with Tenure
Internal Medicine, Cardiology
- *Associate Professor*
Molecular & Integrative Physiology



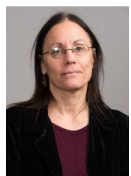
Hiroyuki "Hiro" Mori, PhD
- *Associate Research Scientist*
Molecular & Integrative
Physiology



Todd Herron, PhD
- *Associate Research Scientist*
Internal Medicine, Cardiology
- *Associate Research Scientist*
Molecular & Integrative Physiology



Michael Wang, MD, PhD
- *Professor*
Neurology
- *Professor*
Molecular & Integrative Physiology



Lisa Larkin, PhD
- *Associate Professor* with Tenure
Molecular & Integrative Physiology
- *Associate Professor*
Biomedical Engineering



Lei Yin, MD, PhD
- *Associate Professor* with Tenure
Molecular & Integrative Physiology
- *Associate Professor*
Internal Medicine



Christopher Mendias, PhD
- *Associate Professor* with Tenure
Orthopedic Surgery
- *Associate Professor*
Molecular & Integrative Physiology

SPOTLIGHT ON ALUMNI



Dr. **Lisa Leon** received her Ph.D. from the Department of Physiology at UM in 1996. She conducted the last two years of her

Ph.D. work at the Lovelace Institutes in Albuquerque, NM (while still a UM Physiology Ph.D. student), where she studied the role of cytokines in fever responses to sepsis and local inflammation. Her first year of postdoctoral work was performed at the NIDDK examining the role of leptin and uncoupling protein 3 in core temperature and energy balance responses to fasting. She subsequently spent two years in the Department of Psychology at University of Delaware, examining the effect of maternal separation on the fever response to open field stress and bacterial infection. In September 2001, Dr. Leon accepted a Research Physiologist position in the Thermal and Mountain Medicine Division of the U.S. Army Research Institute of Environmental Medicine (USARIEM), in Natick, Massachusetts. Rapid deployments to the hot, desert environments of Iraq and Afghanistan following the 9/11 attacks resulted in renewed emphasis on the development of better prevention and treatment strategies to protect U.S. Service Members from heat stroke. The last 15 years, her lab has focused on developing novel animal models that simulate responses that are most commonly observed in military heat stroke patients, while supporting identification of circulating biomarkers of heat stroke risk and/or multi-organ damage that will guide better intervention and treatment strategies. Her lab currently conducts animal, field and clinical work to facilitate the transition of experimental findings to heat stroke patients. As of September, 2016, Dr. Leon was appointed Chief of the Thermal and Mountain Medicine Division at USARIEM, with a research portfolio focused on the effect of cold, heat and high altitude on physical and cognitive performance of Service Members. She also serves as an Adjunct Associate Professor in the Department of Health Sciences at Boston University.

PHD PROGRAM

"I have never let my schooling interfere with my education." - Mark Twain



Sue Moenter,
Director

This might seem a rather cheeky quote with which to start a summary on the PhD program, but we chose it as a way to emphasize the diversity of training opportunities our students can, and should, utilize during their time in MIP. This fall, the department hosted an all day workshop to evaluate our PhD program. Both students and faculty participated in discussions on curriculum content, analytic and quantitative training, transferrable skills, and career development. The goal was to evolve the program and make sure it stays aligned with the needs and goals of our current trainees and their future employers in academia and beyond. Two of our alums, Jennifer Davis and Kristen Ruka, presented on their career paths as a part of this program. We also thank Mary O’Riordan, Associate Dean for Graduate and Postdoctoral Studies and Scott Barolo, PIBS Director, for participating in our workshop.

The graduate education fund has continued to grow thanks to the generous support of many of you. These funds are being used to help students travel to scientific meetings and also to meetings

for professional development for the diverse career choices our students are now pursuing. The growth in this fund is terrific as it parallels growth in the program. We welcomed a second consecutive large cadre of PIBS students with a primary interest in MIP (10!) along with a new MSTP student. Three students defended in the past year, our class size has grown to about 40, not including first year students.

We have continued an evening lecture series “A Night at the Academy” to provide students and faculty an opportunity to take advantage of the institution beyond the Medical Center in an informal social setting. Our own John Williams stepped out of the exocrine pancreas to talk about carbon footprint and Shai Revzen from Electrical Engineering and Computer Science told us about using insect movement to inform robotic design. This and other programs help maintain the sense of community that makes graduate education in our department so unique.



Dan Michele,
Associate Director

MIP COMMUNITY OUTREACH EVENT

We are excited to announce the success of a new community outreach initiative spearheaded by MIP. The pilot event was held on Tuesday, November 29th at Wiley Elementary School in Dexter, Michigan. This semester’s theme, “Our Amazing Human Body”, focused on the physiology of five major organ systems in the human body. A group of MIP graduate students spent the day teaching 250 4th graders about the functions of the cardiovascular, respiratory, gastrointestinal, nervous, and immune systems through hands-on, interactive activities.

Throughout the fall semester, MIP graduate students worked in teams to develop the learning materials and exercises for each station. At the cardiovascular station, teams of students competed against each other in a race to pump 4L of water from one bucket to another, trying to beat the time in which their heart can complete this feat. They also measured their heart rates at rest and following exercise to underscore how the cardiovascular system adjusts to the needs of the rest of the body. At the respiratory station, students constructed lung models out of plastic bottles and balloons to learn how the lungs expand and contract when we breathe. They also played a relay beanbag toss game to learn the path that oxygen and carbon dioxide take when we inhale and exhale. At the gastrointestinal station, students simulated the digestion and movement of food from the stomach to the end of the digestive tract in an activity that involved mashing together graham crackers, bananas, and orange juice and then squeezing the mixture through pantyhose. At the nervous system station, students built model neurons out of pipe cleaners and beads, measured their reaction times by catching a falling ruler, and learned how the olfactory and gustatory systems interact during a jellybean taste test. Finally, at the immune station, students learned about the role of phagocytes and lymphocytes in the protection of our immune systems during a rowdy game of sharks and minnows. At the end of the day, students were able to take home a completed booklet containing all the teaching materials and activity results.

The event was a great success, and we are looking forward to our next event, which will no doubt be even bigger and better! Special thank you to Sue Moenter, Michele Boggs, Bishr Omary and everyone else in MIP for all your support and invaluable help, Susan Karsch and the other 4th grader teachers at Wiley Elementary School for their hospitality, and most of all, all the graduate student volunteers who devoted countless hours to planning and executing this fun event.

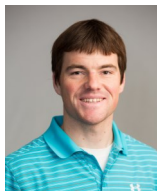


Back row, L to R: Sue Moenter, Ally Cara, Rudi Starrett, Drew Marquis, Kristy Holme, Meggie Hoffman, Brenda Cisneros Larios, Ben Abdon **Front row,** L to R: Liz Ronan, Devika Bagchi, Jeanine Ruggeri, Hanh Truong, Edith Jones

*Graduate student Participants in Outreach Event:

Devika Bagchi, Kristy Holme, Kevin Swift, Natalie Warnsinger-Pepe, Jeanine Ruggeri, Hanh Truong, Edith Jones, Meggie Hoffman, Ben Abdon, Liz Ronan, Ally Cara, Drew Marquis, Brenda Cisneros Larios, Rudi Starrett, Tova Berg, Caroline Adams, Eden Dulka, Marin Augusto Silveira

2016 PHD GRADUATES



Mark Bolinger

Mentor: David Antonetti, Ph.D.

Thesis: Phosphorylation of the Tight Junction Protein Occludin Regulates Epithelial Monolayer Proliferation and Maturation.

Current Position: TechStart Intern, University of Michigan Technology Transfer

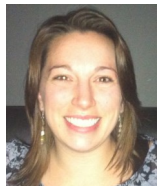


Zachary Harvanek

Mentor: Scott Pletcher, Ph.D.

Thesis: Sexual Deprivation, Emotion, and Longevity: Neuropeptidergic Regulation of Aging in *Drosophila*

Current Position: Returned to third year clinical rotation at UM Medical School



Amy Sutton

Co-Mentors: Dave Olson, M.D., Ph.D. and Martin Myers, M.D., Ph.D.

Thesis: Dissecting Paraventricular Hypothalamic Neural Circuits Involved in Energy Balance Control

Current Position: Postdoc Fellow at MIT's Picower Institute in the laboratory of Dr. Kay Tye.

PHD HONORS & AWARDS 2016

Ben Abdon (*PIBS MIP*) - Rackham Merit Fellowship

Asmita Bhattacharya (*Qi Lab*) - AHA Predoctoral Fellowship

Devika Bagchi (*MacDougald Lab*) - Tylenol Future Care Scholarship Awardee; Center for Or-

ganogenesis Training Grant Predoctoral Fellowship

Tova Berg (*Moenter Lab*) - NIH F30 NRSA

Ally Cara (*EliasLab*) - Career Training in Reproductive Biology Training Grant Fellow

Brenda Cisneros-Larios (*PIBS MIP*) - Rackham Merit Fellowship; Bernard Maas Fellowship

Margo Emont (*Wu Lab*) - NIH F31 NRSA

Joanne Garbincius (*Michele Lab*) - John Williams Outstanding Graduate Student Service Award; Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Award, APS; Rackham Predoctoral Fellowship, UM

Amelia Glazier (*Day/Michele Labs*) - NIH F31 NRSA

Ian Gonzalez (*Olson/Myers Lab*) - John Bean Award for Academic Excellence; Systems & Integrative Biology Training Grant Fellow

Jonathan Gumucio (*Mendias Lab*) - Horace W. Davenport Research Award

Allison Ho (*Lee/Schnell Labs*) - Systems & Integrative Biology Training Grant Fellow

Meggie Hoffman (*Crawford Lab*) - Arthur J. Vander Teaching Award

Jacob Johnson (*Pletcher Lab*) - Biology of Aging Training Grant Fellow

Edith Jones (*PIBS MIP*) - NSF-GFRP Honorable Mention; Rackham Merit Fellowship

Haocheng Lu (*Chen Lab*) - AHA Predoctoral Fellowship

Andrew Marquis (*PIBS MIP*) - Bernard Maas Fellowship

Andrew Schwartz (*Shah Lab*) - Systems & Integrative Biology Training Grant Fellow

Joseph Starrett (*PIBS MIP*) - Bernard Maas Fellowship

Tami Stevenson (*Lawrence Lab*) - Training Program in Translational Cardiovascular Research & Entrepreneurship Fellow

Kristoffer Sugg (*Mendias Lab*) - Cabaud Memorial Award, American Orthopaedic Society for Sports Medicine

Kevin Swift (*Poe Lab*) - Systems & Integrative Biology Training Grant Fellow

Matthew Taylor (*Rainey Lab*) - AHA Predoctoral Fellowship

Fangyun Tian (*Borjigin Lab*) - AHA Predoctoral Fellowship

Danny Triner (*Shah Lab*) - Training in Basic and Translational Digestive Sciences Training Grant Fellow

Keita Uchida (*Lopatin Lab*) - AHA Predoctoral Fellowship

Luhong Wang (*Moenter Lab*) - Endowment for the Development of Graduate Education (EDGE) Award

Natalie Warsinger-Pepe (*Yamoshito Lab*) - HHMI Funds



1st Row (L to R): Thomas Vigil, Kris Sugg, Caroline Adams, Allison Ho, Fangyun Tian, Jeanine Ruggeri, Lindy Jensen, Ben Abdon, Hyo Sub Choi **2nd Row:** Judy Baek, Edith Jones, Margo Emont, Devika Bagchi, Liz Ronan, Ally Cara, Eden Dulka, Tova Berg, Luhong Wang, Surajit Sural, Brenda Cisneros Larios, Huilun Wang, Jonathan Gumucio **3rd Row:** Joanne Garbincius, Natalie Warsinger-Pepe, Francisco Alvarado, Ian Gonzalez, Meggie Hoffman, Keita Uchida, Amelia Glazier, Kristy Holme **4th Row:** Jon Dean, Andrew Schwartz, Rudi Starrett, Kevin Swift, Matt Taylor, Danny Triner, Jeff Phumsatitpong, David Bushart, Andrew Marquis, Haocheng Lu, Vi Tang

MASTER'S PROGRAM

The Class of 2016 in the Master of Science in Physiology program recently graduated, with twenty-one coursework track students finishing in June 2016 and seven research track students finishing by August. The fifth annual Graduation dinner was held at Palmer Commons on June 18th to share the gift of good food, good drink, and short speeches by the Program Director Beth Rust, Associate Program Director Amy Oakley, and MIP Department Chair Bishr Omary.

The primary objective of the M.S. program is to enhance students' preparedness and credentials to successfully compete for positions in (1) academic, pharmaceutical or other research positions, (2) basic science doctoral programs, (3) medical school or dental school or (4) other health related professional programs. So how are our students doing? Success is defined as a student having matriculated to their desired graduate program (i.e. medical, dental, PhD, PA or other program) or having found a job in their career field of choice. Our first class graduated in 2012 and the success rate for the 2012 through 2015 graduates is 81% with a few still applying to medical school during the current cycle. Our 2016 graduates saw about 40% matriculate into medical school immediately following MS completion, with the rest applying during the current cycle or next cycle. We are pleased to have alumni attending many excellent schools across the country, but focusing right here in Ann Arbor, we have an M2 and three M1's at University of Michigan Medical School, a D3 and two D2's at University of Michigan Dental School and two 3rd year PIBS students and two 2nd year PIBS students at the University of Michigan likely to stay in MIP for their PhD re-

search. Feedback from our graduates continues to be very positive regarding the relevance of the M.S. program as preparation for admission to and successful completion of their next programs.

From our first graduating class of 2012, we now have four alumni in their first year of medical residency at the following locations: Sidney Kimmel Medical College – Surgery, Western Michigan University – Internal Medicine, University of Michigan Medical School – Pediatrics, Henry Ford Hospital – Internal Medicine) and one alumna has begun practicing dentistry in Miami, FL.

The class of 2017 consists of 34 total students, 29 in coursework track and 5 in research track. Research students are in the labs of the following mentors: Sharlene Day, Lisa Larkin, Chris Mendias (2) and Costas Lyssiotis. The curriculum is relatively unchanged from last year. We are pleased to have welcomed Peggy Zitek, Ph.D. to our staff as Coordinator of Advising, Professional Development and Student Affairs. Peggy started in February, 2016 and has already made a tremendous positive impact, assisting both alumni and enrolled students with their application process and interview preparation.

In closing, we wish to congratulate the 2016 recipients of the Altshuler Scholarship, with special thanks to the family for making this possible. The class of 2017 is well on its way to great success and we look forward to another outstanding application cycle this Spring for the class of 2018!

Beth Rust

MS Physiology Class of 2016-2017

MASTER'S HONORS & AWARDS 2016

Alexie Larson
- 2016 Altshuler Scholarship

Zaid Mohsen
- 2016 Altshuler Scholarship



SUMMER FELLOWSHIP PROGRAMS

This year we received over 200 applications for our four undergraduate summer research programs:

- Summer Undergraduate Research Fellowship program (SURF)
- Short Term Educational Program (STEP)
- Summer Undergraduate Research in Physiology (SURP)
- Cancer Research Summer Fellowship Program

Our programs engage students in a 12-week summer research experience, with a long-term goal of inspiring them towards a career in biomedical research and in the short term - recruiting them back to graduate programs at the University of Michigan. The laboratory hands-on research experience is complemented by a weekly noon lecture series with presentations on responsible conduct of research, several aspects of normal physiology, how disorders of physiology lead to disease, and career advice. Students concluded their research experience by participating in undergraduate research forums, which were held in August 2016. Many of the students contribute substantially to research papers, and are included as co-authors.

The SURF is the longest running program for undergraduate education in MIP, with students supported in part by the department, from research grants, and philanthropy. This year we supported 13 undergraduate students: seven students from the University of Michigan, two students from Calvin College, and one student each from John Hopkins University, Hope College, University of Maryland, and University of Washington. The STEP program is funded by an NIH/NDDK R25 grant. It is specifically targeted to encourage students from quantitative engineering backgrounds to apply their training to research relevant to digestive and metabolic diseases. This year, the STEP program supported seven undergraduate students from John Hopkins University, Dartmouth College, Columbia University, University of Pennsylvania, Georgia Tech University, University of Pittsburgh, Northern Michigan University, and Canisius College. The STEP R25 was just renewed for five years (2016-2021, PI - Santiago Schnell).

The SURP Program is supported by another R25 (PI - Jimo Borjigin, NHLBI). Its goal is to attract students from underrepresented groups to pursue research in heart, lung and blood diseases. The recruitment of the SURP students and selection of the summer seminar speakers were conducted in collaboration with the summer program at the Cardiovascular Center directed by Dan Michele. We supported 13 students through the SURP program this year. The renewal R25 applica-



tion by Jimo, received an outstanding score and is likely to be refunded.

The Cancer Research Summer Fellowship Program, directed by Yatrik Shah, was supported by MIP, Translational Oncology Program, Comprehensive Cancer Center and PIBS. The goal of the program was to recruit students from underrepresented backgrounds to conduct research in Gastrointestinal-related cancers. The inaugural class supported five undergraduates from: University of Texas, University of Puerto Rico, University of Rochester, Saginaw Valley State, and Southern Georgia University. Due to the success of the pilot program, a R25 will be submitted to NCI in January.

Our summer programs show our department's commitment to encourage and foster the success of students from all backgrounds to attain advanced degrees, research careers, and positions of leadership in physiology and biomedical sciences. We have continued to increase the proportion of underrepresented undergraduate students participating in the SURF and STEP programs thanks to the generous support of the University of Michigan Rackham Faculty Allies for Diversity in Graduate Education, which provided support for two additional underrepresented students. Feedback on these programs from our undergraduate researchers has been extremely positive, and we are all looking forward to next summer's programs.

*Jimo Borjigin
Ormond MacDougald
Dan Michele
Santiago Schnell
Yatrik Shah*

POSTDOCTORAL SOCIETY

Tammy Barnes - ADA Postdoctoral Fellowship Award

Kavaljit Chhabra - Novel disease Model Award, American Physiological Society; ABRCMS Abstract Reviewer, Physiology Section

Elise Demitrack - Debbie's Dream Foundation-American Association for Cancer Research Career Development Award in Gastric Cancer Research

Mark Jimenez-Canet - Ruth L. Kirchstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship by the NIH (NIDDK)

Callie Corsa - Multidisciplinary Training Program in Basic Diabetes Research Fellowship (T32)

Dongil Kim - AHA Postdoctoral Fellowship Award

Geun Hyang Kim - American Diabetes Association Postdoctoral Fellowship

Kazutaka Namba - Meeting of the International Aldosterone Conference Young Investigator Competition Finalist

Minjung Park - MICHR Postdoctoral Translational Scholars Program, UM

Sadeesh Ramakrishnan - AHA Postdoctoral Fellowship; AHA James & Donna Dickenson-Sublett Award for Advancement of Cardiovascular Research; Cozzarelli Prize from National Academy of Sciences; NIH Pathway to Independence Award

Juilee Rege - MICHR Postdoctoral Translational Scholars Program, UM; Partial Judges' Travel Subsidy, ABRCMS; New Investigator Award. Adrenal Cortex Conference; Outstanding Abstract Award, Endocrine Society Meeting; Presidential Poster Competition Finalist, Endocrine Society

We are happy to report that the MIP postdoctoral society has continued to be a successful avenue of support for our department's postdoctoral fellows and research investigators. This has been our first full year with Dr. Yatrik Shah as our faculty advisor. He has been instrumental in working with us to brainstorm ideas for our monthly meetings, secure the speakers that we have had for those meetings, and serve as a valuable resource for career advice and mentorship in addition to what we receive from our research mentors. We look forward to continuing with Dr. Shah as our advisor for the upcoming year.

This year, we had two "themes" for our monthly meetings. One theme focused on both academic and non-academic career planning, featuring talks from the University of Michigan Technology Transfer Office and the Center for Entrepreneurship in the College of Engineering, as well as talks by two external speakers: Dr. Ian Moench, a MIP postdoctoral alumnus who now works for GlaxoSmithKline and Insook Kim from the Food & Drug Administration. We were also fortunate to have a panel discussion led by our very own Dr. Bishr Omary and Dr. Eric Fearon who discussed how to prepare for an academic job interview, with specifics related to chalk talks, the recruitment process and how to be more competitive to a faculty search committee. We feel that is important to be aware of all possible career trajectories available to us as junior scientists and these meetings have been beneficial to those of us who will be entering the job market in the near future. The second

theme of our meetings this year was to highlight the different core facilities and other research services that are available to us here at University of Michigan. These meetings featured talks from Dr. Thom Saunders who heads the Transgenic Animal Model Core, and Brenda Eakin, the Translational Research Programs Manager at MICHR. Overall, the meetings continue to be informative and a great asset to our training in MIP.

We are also happy to report the hosting of the first MIP Postdoctoral and Research Investigator Research Symposium, held November 16. We were fortunate to host Dr. Susan Henning, from the University of North Carolina-Chapel Hill, as our keynote speaker. Dr. Henning is an expert in the field of intestinal stem cell biology, and has a very successful record of mentorship. In addition to her keynote lecture, she led a roundtable discussion on mentoring trainees, with a particular focus on the Symposium was mentoring women in their academic training. The Symposium was accompanied by the bestowing of a teaching/service award (recipient: **Kavaljit Chhabra**) and 3 Postdoctoral research awards (recipients: **Chris Halbrook**, **Sadeesh Ramakrishnan** and **Elise Demitrack**). The 3 recipients of the research awards gave short talks prior to Dr. Henning's keynote lecture.

We again would like to thank Dr. Omary for continuing to support the MIP postdoctoral society. Our meeting attendance remains strong and we appreciate the encouragement and support of our department and Dr. Shah for their commitment to our success. Thank you

also to Michele Boggs, Angie Tucker and the rest of the MIP staff for organizational help. We have had another wonderful year!

*Elise Demitrack
Nicole Bellefontaine
Mark Jimenez-Canet*



L to R: Kavaljit Chhabra, Chris Halbrook, Yatrik Shah, Sadeesh Ramakrishnan, Elise Demitrack and Susan Henning

New Training Opportunity for MIP & BME Postdocs

In a collaborative effort, MIP and Biomedical Engineering (BME) were recently awarded a five-year NIH/NIGMS K12 grant totaling \$3.64 million. This IRACDA (Institutional Research and Academic Career Development Award) grant allows MIP and BME to recruit and fully



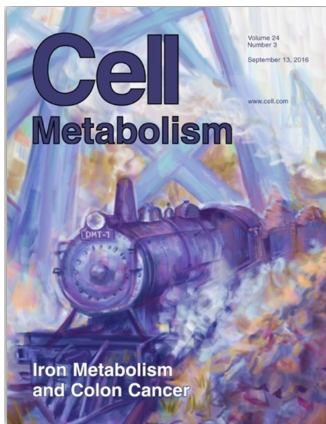
Victor Cazares

support 3 postdoctoral scholars a year for three years, with the stipulation that the fellows spend 75% of their time in research with a BME and/or MIP faculty mentor and 25% of their time working with a teaching mentor from Henry Ford College (HFC) or Wayne County Community College District (WCCCD) to teach the community college students from our partner schools. A fourth year of support is provided by the research mentor and allows the scholars to complete their research projects and publish their papers, carry out limited teaching and work towards securing a faculty position. The Co-PIs on this effort are David Sept (BME) and Bishr Omary (MIP), who are very excited about this opportunity and about working closely with colleagues at HFC and WCCCD. The first two Michigan IRACDA scholars, Victor Cazares (mentored by Geoff Murphy) and Wylie Stroberg (mentored by Santiago Schnell) were recently selected and have already met with their teaching mentors and will begin their teaching experience in January. We anticipate holding a half-day Spring term symposium at the U-M that brings together students and faculty from WCCCD and HFC. You can catch up on the latest activities of this program at <http://iracda.umich.edu>.



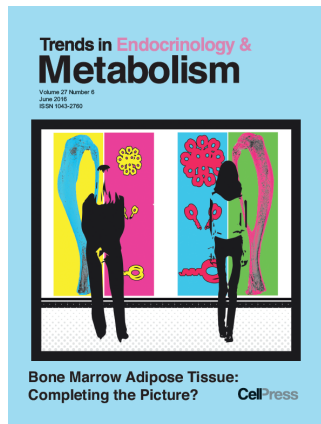
Wylie Stroberg

Covering the Covers

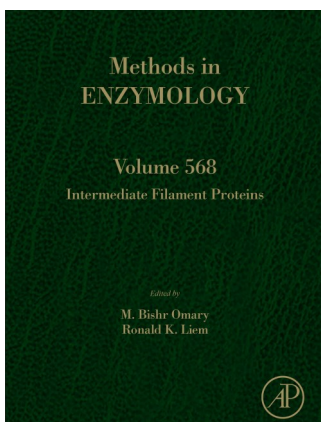


Yatrik Shah &

Christin Carter-Su Labs



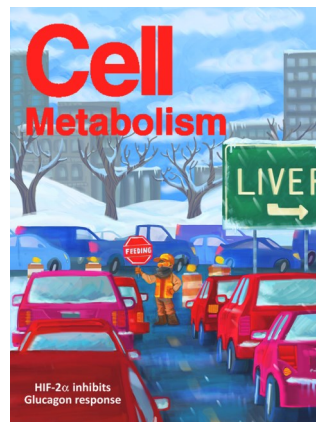
Ormond MacDougald Lab



Bishr Omary

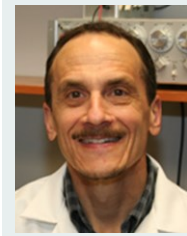


Santiago Schnell Lab



Yatrik Shah Lab

SPOTLIGHT ON ALUMNI



The microcirculation provides oxygen and nutrients to cells throughout the body and is integral to athletic performance. University alumnus

Steven S. Segal received a dual degree in Kinesiology (Education) and Physiology for his PhD in 1984, with a focus on skeletal muscle structure and function. He undertook postdoctoral training at the University of Virginia (Charlottesville) to study the microcirculation, where he identified a novel signaling pathway in the smallest arteries (“arterioles”) that control tissue blood flow. Steve’s first faculty position (1987) in the Noll Laboratory for Human Performance at Pennsylvania State University (State College, PA) established his research focus on blood flow control in the microcirculation of skeletal muscle. Steve was recruited (1992) to the John B. Pierce Foundation Laboratory with a concomitant appointment in Cellular and Molecular Physiology at Yale School of Medicine (New Haven, CT), where his laboratory resolved distinct yet complementary mechanisms of cell-to-cell communication underlying blood flow regulation in microvascular resistance networks. Steve was recruited to the University of Missouri in 2006, where he received a MERIT Award from the NIH. His research is concerned with understanding the cellular and molecular signaling events that orchestrate vasodilation and vasoconstriction and how these integrative processes are governed by the nervous system. He continues as an endowed professor in Medical Pharmacology and Physiology at Mizzou and as an Investigator for the Dalton Cardiovascular Research Center (Columbia, MO) with adjunct appointments in Medicine, Biomedical Sciences and Biological Engineering.

SPOTLIGHT ON ALUMNI



MIP alumna, **Jennifer Davis**, was a graduate student in Joe Metzger's lab and received her PhD in 2007. Jen is now an assistant professor in

the Departments of Bioengineering and Pathology at the University of Washington where her lab is housed in the Institute for Stem Cell and Regenerative Medicine. The Davis lab uses integrative and systems biology approaches to understand how the collective action of physical forces directs cardiac plasticity and remodeling during development, regeneration, and disease. The heart's mechanical milieu is primarily determined by the collective function of myocytes and fibroblasts. The integration of myocyte force generation and fibroblast production of matrix underlies the heart's mechanical state and structural integrity. Jen's lab recently developed a genome-guided biomechanics approach for quantifiable tuning of cardiac muscle or matrix mechanics in transgenic mice to define the mechanical mechanisms underlying pathologic remodeling of the heart (Cell, 2016). This approach, in combination with genetically coded fluorescent tension sensors, provides a unique platform for interrogating the role of forces in cardiac biology for the first time in vivo and to determine how the mechanical state and feedback inform their behavioral decision making to remodel. Jen believes that addressing these objectives will revolutionize clinical and regenerative medicine strategies for heart failure, with the potential for new targeted therapies to be more efficient than current chemical or genetic strategies. Her work in genetically tuning the heart's fibrotic matrix was recognized by the AHA (2014) with the Louis N. and Arnold M. Katz Prize for basic cardiovascular research.

FAULKNER LECTURE

The 5th annual endowed John and Margaret Faulkner Lecture was held on December 5, 2016. Dr. Stephen G. Young, Distinguished Professor of Medicine and Human Genetics at UCLA gave an exciting presentation regarding his work that defined the molecular mechanism for triglyceride hydrolysis in plasma, which had been misunderstood and based on erroneous assumptions for many years. Dr. Young's work included the identification of the essential role of the protein, glycosylphosphatidylinositol-anchored high density lipoprotein binding protein 1, in shuttling the parenchymal enzyme lipoprotein lipase to the capillary lumen. Dr. Young is an internationally renowned investigator and is a member of the National Academy of

Sciences. His visit included meeting with graduate student and postdoctoral fellows and provided us an opportunity to thank John and Margaret, and John's friends and past trainees, for their generous gift that made this lectureship possible.



L to R: John Faulkner, Stephen G. Young and Ormond MacDougald

Happy
Holidays

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GIFT OPPORTUNITIES

Graduate Education Endowment Fund

The Graduate Education Fund was established in the Fall of 2008 to support PhD education and research. This fund provides financial support in perpetuity for graduate education in Molecular & Integrative Physiology and is being used to propel the development of future generations of biomedical researchers. Your donations have been instrumental during the past eight years to create the endowment. Your donations are matched 1:1 by the Dean of the Medical School up to \$500,000 to allow us to reach our ultimate goal of a \$1,000,000 endowment. The return on this endowment is now being used to help subsidize attendance by our PhD students at scientific meetings. The current balance of \$763,000 includes \$310,000 in matching funds.

Christin Carter-Su Fund

As many of our faculty and alumni know, Christin Carter-Su has been an extraordinary colleague and mentor for decades, and the quality of her research is well-known and highly respected worldwide. We hope to raise \$250,000 to meet an equal match from the Carter and Carter-Su families and the Medical School – once this goal is achieved, Dr. Carter-Su will be the first of our female faculty to have a named Collegiate Professorship in her honor. If you're a colleague, friend or former trainee of Dr. Carter-Su, we hope that you'll join us in supporting this important effort.

Master's In Physiology Education Fund

This new Master's in Physiology Education Fund will provide scholarship support toward tuition for future M.S. students. A gift at any level is welcomed and greatly appreciated – and if you are interested in establishing a named, endowed scholarship, we would be happy to provide you with information on the Michigan Bicentennial Matching Initiative. This initiative is designed to establish endowed scholarships, and the University will match 50% of any gift in the range of \$50,000-\$250,000. Such gifts can be contributed by up to four individuals and be made over five years.

To provide a gift to one of our programs, please visit medicine.umich.edu/dept/molecular-integrative-physiology. Select the "Giving" link in the menu on the left side of the screen. Choose the "Give Online" link followed by the specific program and amount of your donation. If you prefer to donate with a check, please make it payable to the University of Michigan and indicate the program that you would like to support. Please send the check to: Anne Many, Dept. of Physiology, 1137 E. Catherine St., 7744 MS II, Ann Arbor, MI 48109-5622. If you have any questions whatsoever regarding the above funds, or questions regarding the Department of Molecular and Integrative Physiology, please contact Bishr Omary at mbishr@umich.edu. We thank you for your generous support!

