# DEPARTMENT OF MOLECULAR & INTEGRATIVE PHYSIOLOGY

### SCHOOL OF MOLECULAR & CELLULAR BIOLOGY

# **Greetings from the Head**

Welcome everyone to the 2022 edition of the MIP Newsletter!

I hope this year has been a good one for all of you, filled with good health, joy, and plans for the future. As I start my second five-year term as Head of the Department of Molecular & Integrative Physiology, I am glad to see our campus, our school, and our department returning to pre-pandemic mode. A highlight of this return to (semi) normalcy is that we have been able to hold in-person classes, seminars, and small gatherings again.

Indeed, this fall we had our first in-person C. Ladd Prosser Lecture and the first in-person departmental retreat since 2019. This year's Prosser Lecture speaker was comparative physiologist **Prof. Suraj Unniappan**, the Centennial Enhancement Chair and Professor of the Department of Veterinary Biomedical Sciences of the University of Saskatchewan. Also, this year's annual retreat speakers included our own Prof. **Benita Katzenellenbogen** and her former Ph.D. student, **Prof. W. Lee Kraus**, the Director of the Cecil H. and Ida Green Center for Reproductive Biology Sciences of University of Texas Southwestern Medical Center, Dallas.

This issue of the MIP Newsletter features interviews with **Prof. Milan Bagchi** (on occasion of his reappointment as Director of the School of Molecular & Cellular Biology) and **Prof. Jongsook Kim Kemper** (on occasion of her upcoming retirement); introductions to two new affiliate faculty members, **Prof. Pablo Pérez Piñera** (Bioengineering) and **Prof. Timothy Fan** (Veterinary Clinical Medicine); alumni highlights from **Dr. Valeria Sanabria Guillén** (former Ph.D. student with **Prof. B. Katzenellenbogen**), **Dr. Jiaren Zhang** (former Ph.D. student with **Prof. Hee Jung Chung**), and **Dr. Whitney Edward**s (former Ph.D. student with **Prof. L. Raetzman**); and an In Memoriam piece celebrating the life of **Prof. Eric Jakobsson** written by his former Ph.D. student (and current University of South Florida Associate Professor) **Dr. Sameer Varma**.

Finally, I hope that our alumni and friends remain actively committed to MIP. Such support is crucial to our scientific enterprise, and it helps us achieve our goal of keeping our department as one of the most prestigious places to do research and receive education in modern molecular and integrative physiology.

I wish you all a happy, productive, and healthy 2023!

### **Claudio Grosman**



2022

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# **Professor Milan Bagchi:** Decoding Extracellular Vesicles and Directing the School of MCB

By Manasi Inamdar (Ben Auerbach's lab )

Dr. Bagchi is the Deborah Paul Professor of Molecular and Cellular Biology and current director of the School of Molecular & Cellular Biology. Dr. Bagchi's lab focuses on the molecular pathways regulated by the steroid hormones estrogen and progesterone and the hormonal mechanisms that regulate embryo implantation and fertility.

## How did your passion for science develop and what led you to become excited about biology?

As far back as I remember about my childhood in India, biology has always fascinated me. I was interested in nature, plants, and animals, and I wondered how the diversity of life around us was created. I gravitated to science in high school, probably influenced by the fact that my three older siblings were already studying science. Initially, I was drawn to the mystery of chemistry, particularly how one thing interacts with another to create something entirely new. So, when I went to Presidency College, a premier academic institution in India, I chose chemistry as a major. Then, along the way, I discovered the discipline of biochemistry.

During the summer break of my final year in college, I came across a magical book – *Molecular Biology of the Gene* – written by Nobel laureate Jim Watson. I devoured it over a few days, totally fascinated by the new world of facts that was revealed to me. I was so inspired by the subject that there was no question in my mind that I would go to the United States of America to do research in molecular biology to understand the inner workings of a cell.

## How did your doctoral and postdoctoral research experience shape your work and career?

After completing a master's degree in biochemistry, I came to the U.S. as a graduate student to work in the laboratory of Professor Naba Gupta at the University of Nebraska, Lincoln. Professor Gupta was a former trainee of Nobel laureate Professor Gobind Khorana whose team cracked the genetic code at the University of Wisconsin. I worked on the biochemical characterization of cellular factors that regulated the initiation of protein synthesis. It involved a lot of hard work in the cold room but I became quite an expert in protein purification, which helped me in my later work.

After finishing my Ph.D., I sought postdoctoral training in the field of eukaryotic gene regulation. I went to Baylor College of Medicine, Houston, to train with Professor Bert O'Malley who made the pioneering discovery that steroid hormones act via their nuclear receptors to regulate the transcription of target genes. I had very successful postdoctoral training in the O'Malley lab, publishing several papers in journals like *Nature, PNAS*, etc. From that time forward, it became my life-long passion to fully understand the layers of mechanisms that control steroidregulated processes, and I am still working to decipher it.

## What motivated you to join academia and set up your research lab in MIP at UIUC?

Research is my passion and I also love to teach. The best way to combine these two interests is to become a faculty member in a university setting. I started my independent faculty career as Staff Scientist (Assistant Professor) at the Center for Biomedical Research of the Population Council at The Rockefeller University, New York, in 1992. I was recruited as a tenured professor to the Department of Molecular & Integrative Physiology in the School of Molecular & Cellular Biology at the University of Illinois Urbana-Champaign in 2001.

### Please tell us about your research program.

My laboratory is working to characterize, at molecular and cellular levels, the pathways regulated by the steroid hormones estrogen and progesterone during the development and differentiation of the female reproductive tract. A major goal of my research program is to explore the hormonal signaling mechanisms that regulate maternal-fetal interactions during implantation and establishment of the placenta. Gene expression profiling and ChIP-Seq analyses in our laboratory uncovered novel pathways regulated by the steroid receptors in the uterine tissue, providing important insights into the cellular mechanisms by which implantation and placentation are controlled.

The combination of this new knowledge with functional analysis in conditional gene knockout mouse models has led to the development of a blueprint of the molecular networks that mediate the hormonal regulation of these processes. A clear understanding of the gene pathways underlying the biological actions of the steroid hormones in various uterine tissue compartments will provide important insights that enable rational approaches toward clinical intervention in diseases, such as endometriosis, and various reproductive dysfunctions, including pregnancy loss, intrauterine growth restriction, and infertility.

### What is the current research focus of your lab and what do you find most exciting about this particular area of research?

We are currently investigating how hormonal pathways control cell-cell communications by regulating the secretion and uptake of extracellular vesicles (EVs) which carry a variety of molecular cargo. In two recent papers published in *PNAS* and *Endocrinology*, we have demonstrated that EVs secreted by the uterine cells regulate endometrial differentiation and angiogenesis and ensure coordination of these processes with trophoblast function during the progressive phases of implantation and placentation.

### You are donning multiple hats; in addition to being a PI, you are also the Director of the School of Molecular & Cellular Biology. What does a day in your life look like? I enjoy all my academic roles: researcher, teacher, and science administrator. However, it is a fine balancing act to manage my duties effectively. I do different things at different times of the day to maximize my productivity.

My brain is freshest in the morning, so I devote this time to reading, writing, and thinking creatively about my research. Later parts of the day are reserved for meetings and consulting with people, listening to various issues and problems that constantly come up, and trying my best to find solutions to advance the academic mission of the school. I spend my weekday evenings at home with my wife Indrani Bagchi, who is also a busy professor, to unwind and relax after a long day of work. I indulge in my hobbies during the weekend.

### Do you have any advice for young scientists and trainees?

Follow your instincts and passion. While in the laboratory, focus on your work and try to do quality science because your future career and success depend on it. Whether you select a career path in academia or



The secretion of extracellular vesicles (EVs) by human endometrial stromal cells (HESC) is induced by hypoxia and controlled by the HIF2a-Rab27 pathway. EVs mediate vital communications between stromal, endothelial, and trophoblast cells within the uterine tissue to support decidualization, angiogenesis, and trophoblast differentiation during early pregnancy.

industry does not matter. Working in academia can be extremely fulfilling, but it also has its challenges. These days, one can pursue many other avenues to build a satisfying science-related career. Do not ignore your personal life. It is important to have a proper work-life balance as you pursue your career.

## In addition to research, what are the other things that you enjoy the most in life?

Whenever I get a chance, I love to travel around the world, learning about new places and cultures. I go for culinary explorations in search of good food, try out new cocktails and recipes in my kitchen, read books that interest me, listen to music, and enjoy tending to my flower garden.

## If you were to choose a different field of research that's distinct from your current one, what would it be?

Certainly, it is neuroscience. It is the frontier of science that will allow us to understand brain function at multiple levels of organization, from molecular and cellular levels to behavior and information processing. This conviction drove me to work very hard as the school's director to oversee our launch of the new undergraduate degree program in neuroscience in MCB and help the Department of MIP hire several new faculty in this area.



## **Professor Jongsook Kim Kemper:** The Music Behind Autophagy

Dr. Kemper is Professor Emeritus of Molecular & Integrative Physiology. Her lab focuses on metabolic signaling and epigenomic control of metabolism and energy balance.

By D. Walker Gauthier (Ben Auerbach's Lab)

## How did you first get interested in science?

I was always interested in nature even when I was a young child. I was fascinated by how ants gathered in a mass like a micelle structure around a drop of ice cream (although it gave me goose pumps) or how leaves changed colors in the fall. I really wanted to know how these things in nature worked. In high school, I enjoyed and did very well in science courses.

When I had to choose a major in college, I had to decide which of my passions to follow: music or science. I came from a musical family – my father was a professor who taught piano at a university – so I grew up with constant music in the house. My three older sisters all majored in musical areas: voice, piano, and composition. My parents felt that three daughters in music was enough and encouraged me to go into science. So, I studied science at Seoul National University in Korea.

## What drew you to the University of Illinois Urbana-Champaign (UIUC)?

Interestingly, several of my older friends who graduated from Seoul National University were alumni of the Department of Molecular & Integrative Physiology at UIUC and spoke very highly of the graduate program. When family considerations brought me to UIUC, I was very happy to have the opportunity to undertake my graduate studies in MIP.

## What led you to your research area during your Ph.D.?

The faculty of MIP had diverse research interests and several areas interested me. A key experience was attending a seminar given by Dr. Byron Kemper on the research he had done on his sabbatical year at the National Institutes of Health. He had studied the role of chromatin structure in the gene regulation by DNase 1 hypersensitivity and in vivo footprinting approaches. I found trying to understand how genes are regulated to control cellular physiology very fascinating, so I joined Dr. Kemper's lab for my Ph.D. studies and have continued to study gene regulation ever since then.

### How did your doctoral and postdoctoral experience shape your research career?

In my doctoral studies, I studied the gene regulation of cytochromes P450 in drug metabolism, and in my postdoctoral studies in labs of Dr. David Shapiro, here at UIUC, and Dr. James Whitlock at Stanford University, I studied the role of nuclear receptors in gene regulation.

To begin my independent studies, I combined the nuclear receptor experience with that of the P450s, to examine the nuclear receptor regulation of the P450 CYP7A1, which catalyzes the conversion of cholesterol to bile acids. This first study evolved into my present research on the transcriptional regulation of bile acid and lipid metabolism and its dysfunction in diabetes, obesity, and liver disease.

Looking back, what do you think your favorite research finding was? This is a difficult question because there are many favorites. My earlier studies revealing the posttranslational regulation of nuclear receptor function in physiology and its dysregulation in obesity (published in *Cell Metabolism and EMBO Journal*) are near the top of the list.

However, probably my favorite is the study showing that autophagy is regulated by the feeding-sensing nuclear receptor FXR (published in Nature). Autophagy, meaning self-eating, is a fundamental biological process that is critical for cellular homeostasis and its dysfunction is associated with many diseases, including metabolic disorders, neurological disease, and cancer. Autophagy had been considered as a stress response under extremely stressful conditions like starvation, but we demonstrated that autophagic regulation occurs during the normal physiological

# Nature doesn't yield its secrets easily.

feeding/fasting cycles to maintain energy balance and that longterm transcriptional control by FXR is important for its sustained regulation.

Further, this study was the foundation of several important following studies in my lab. Because this research finding provided new insights into the autophagy regulation and raised interesting new questions for further research, I would have to say this is my favorite.

## Do you have any advice for young scientists and trainees?

Nature doesn't yield its secrets easily. For every successful experiment, there will probably be many preliminary and failed experiments. Rather than being discouraged by failures, we need to step back and think why it didn't work. Often, we learn more from "failed" experiments than successful ones. In choosing your research topic, it is important to follow your passions to give you the drive to persevere through the bad times to be successful. If you do, being the first to understand something new about how nature works and possibly to develop an approach to improve human health are extraordinarily rewarding.

## What do you enjoy most outside of your research?

I enjoy time with my family, especially talking about food with my sister and daughters. I also enjoy hiking and gardening with my husband and listening to classic music and watching K-drama. I also enjoy traveling - one of the fun things to do in science is traveling to meetings at interesting places. I hope to enjoy golf after retirement - I started taking lessons and it is already obvious that it will take the same passion and perseverance that I have for science to succeed at golf!



Assistant Head, Research & Graduate Studies, Veterinary Clinical Medicine, College of Veterinary Medicine

The accurate modeling of cancer processes is essential for advancement of scientific discoveries to expand our understanding of disease biology. Traditionally, cancer research has relied upon laboratory animal studies, and more recently has expanded to include sophisticated engineered platforms to

# **New MIP Affiliate Faculty:** Dr. Timothy Fan

more accurately recapitulate cancer initiation, progression, and metastasis. Complementing these model systems, recently, dogs with naturally-occurring tumors have been recognized as a valuable scientific resource for cancer focused investigations. In particular, conserved tumor biology between humans and dogs have been identified in six comparative tumor histologies, being lymphoma, mammary carcinoma, glioma, melanoma, urothelial carcinoma, and osteosarcoma. The availability of pet dogs with naturally-occurring cancers serves as a potential and unique resource for advancing non-invasive cancer-related investigations, including device and therapeutic development.

The Fan Laboratory within the Department of Veterinary Clinical Medicine has adopted and refined

the comparative oncology approach for accelerating the clinical translation of novel cancer therapeutics. Through a clinical trialing program and collaboration with basic scientists from diverse fields, such as chemistry and engineering, the Fan laboratory is pushing the boundaries for evaluating novel cancer treatments in pet dogs and cats, in which conventional therapies afford limited benefit. In particular, the Fan laboratory explores how to amplify immune recognition of cancers through either small molecules or immunotherapeutic manipulations including intratumoral cytokines, adjuvants, and adoptive cellular therapies. Current tumor types that remain central to the Fan laboratory exploratory efforts are metastatic sarcomas, glioma, melanoma, and carcinomas of the head, neck, and urinary system.



Associate Professor, Department of Bioengineering

## **New MIP Affiliate Faculty:** Dr. Pablo Pérez Piñera

Humankind is now on the cusp of a genome editing revolution sparked by the discovery and adaptation of the CRISPR-Cas9 nuclease system for modifying human genomes. The rapid technological advances in genome editing that followed that initial discovery enable facile, precise, and safe modification of genomic DNA in living cells, which we are harnessing in combination with state-of-the-art gene delivery techniques for biomedical applications. Our laboratory works at the intersection of engineering and physiology to create novel gene therapies for modulating expression of genes that play pathogenic roles in Duchenne muscular dystrophy, Huntington's disease, and amyotrophic lateral sclerosis amongst others.

# ALUMNI HIGHLIGHT



### **Dr. Valeria Sanabria Guillen** (Katzenellenbogen Lab)

### **Your current position and title:** Consultant, Boston Consulting Group

## Your career arc and key accomplishments:

I joined Benita Katzenellenbogen's lab in 2015, where I worked in collaboration with the John Katzenellenbogen lab to study various aspects of the oncogene FOXM1. Over my time at the K lab, I contributed to projects exploring the role of FOXM1 in resistance to breast cancer treatment, development of novel small molecule therapies targeting the oncogene FOXM1 for the treatment of aggressive and metastatic breast cancers, and combination therapies leveraging our novel compounds to synergistically inhibit breast cancer tumor growth. This work was supported by the NIH Chemistry **Biology Interface Training Program**, where I became a fellow in 2016.

I graduated from the university in Fall 2020. In 2021, I joined Boston Consulting Group, where I focus on supporting clients across a variety of topics in healthcare.

## How MIP training got you where you are:

It was a privilege to be mentored directly by Drs. Benita and John Katzenellenbogen, the members of their lab, and my thesis committee. In addition, I am grateful to the MIP faculty as a whole for their warm support during my classes and TAships.

## Your favorite memory related to the time you spent in MIP:

All the laughter and fun that accompanied daily lab work at the K lab!

### Fun fact about yourself:

I have two dogs: a golden retriever named Murph and a goldendoodle named Sprout!

# ALUMNI HIGHLIGHT



### **Dr. Jiaren Zhang** (Chung Lab)

**Your current position and title:** Scientist II, Novo Nordisk

## Your career arc and key accomplishments:

After graduation in 2021, I joined WuXi Biologics where I led multiple projects and worked with global biotech companies to develop large molecule drugs. I had the chance to learn about protein purification and delivered 50+ molecules in six months. I was also involved in highthroughput protein production, a powerful tool in molecule screening.

One accomplishment that I was particularly proud of was leading 8 individual projects involving monoclonal antibodies (Ab), bispecific Ab, and recombinant proteins by monitoring progress, leading weekly client calls, and presenting key findings to domestic and international clients. It was a great experience working with companies at various stages (top biopharma to start-ups) on projects from a diverse range of disease areas (cancer, metabolic disease, auto-immune disease, reproductive disease).

In August 2022, we left Shanghai and moved to Beijing where I joined Novo Nordisk Research Center China as a scientist. Our department is mainly focused on developing new biomolecular technologies and proposing new drug targets.

## How MIP training got you where you are:

A few things I learned in MIP:

1. Scientific communication. Graduate students have a lot of opportunities to present their research, e.g., department retreats, MCB recruiting events, department seminars.

2. Interdisciplinary collaboration. The collaborative environment enables everyone to reach out to another lab and propose a collaboration. At the time, we were working on a few projects with professors from other labs in MIP, as well as labs from the Center for Biophysics and Quantitative Biology and Departments of Psychology and Biochemistry.

3. How to quickly get into a new field: By collaborating with experts from diverse backgrounds, it was natural that we had to learn about new fields within a very short period of time. This experience helped me tremendously when I was at WuXi Biologics and has definitely been valuable for me at Novo Nordisk.

## Your favorite memory related to the time you spent in MIP:

My favorite memories at MIP include the Halloween parties and the department retreat at Allerton Park. The scavenger hunt was super fun, and it was nice exploring Allerton in May.

### Fun fact about yourself:

Not exactly "fun", but I didn't leave my house for 86 days during the Shanghai lockdown earlier this year. Prior to this, I didn't think this would have been possible.

# ALUMNI HIGHLIGHT



Left photo: From left: MIP Research Scientist Karen Weis, Professor Lori Raetzman, Kirsten Eckstrum (PhD, '17, MIP), Whitney Edwards (PhD '18, MIP).

*Right photo: Weis and Edwards during a lab trip to Chicago.* 

## **Dr. Whitney Edwards** (Raetzman Lab)

### Your current position and title:

Postdoctoral Research Fellow, University of North Carolina at Chapel Hill

## Your career arc and key accomplishments:

- B.S. Bochemistry, St. Edward's University, 2012
- Ph.D. Molecular and Integrative Physiology, 2018
- Postdoctoral Fellow, University of North Carolina at Chapel Hill, 2018-Present
- Visiting Professor, Department of Biology, North Carolina Agricultural and Technical State University, 2020
- Soon-to-be Assistant Professor Department of Cell Biology and Physiology, University of North Carolina at Chapel Hill (2023)

Key Accomplishments:

- Outstanding Contribution to MIP, UIUC, 2018
- Award for Academic Excellence, Graduate College Office of Diversity, Equity & Inclusion, UIUC, 2018
- Outstanding Thesis Award, MIP, UIUC, 2019
- IRACDA Postdoctoral Fellowship, UNC, 2018-2021

• American Heart Association Postdoctoral Fellowship, UNC, 2021-Present

## How MIP training got you where you are:

First and foremost, Dr. Lori Raetzman was an amazing mentor. When I joined Dr. Raetzman's lab, I had minimal research experience. Lori helped me develop into an independent scientist and showed me the qualities of an effective mentor and teacher. In addition to my immediate lab, MIP provided me with a close community of scientists that provided invaluable structure and support throughout my graduate studies.

## Your favorite memory related to the time you spent in MIP:

My favorite memories of MIP:

- Working with my labmates to organize/plan the MIP annual retreats at Allerton Park
- The holiday door decoration competition between the Raetzman, Bagchi, and Nelson labs
  The MIP Halloween parties
- The Mill Hanoween partie

### Fun fact about yourself:

As a graduate student, I developed a passion for baking and often used my labmates to test new recipes and ideas.





# **The 2022 MIP Annual Retreat**



The 2022 MIP Retreat Organizing Committee with keynote speakers W. Lee Kraus and Benita Katzenellenbogen (left to right: Anushna Sen, Sayee Anakk, Anasuya Das Gupta, Claudio Grosman, Xinzhu Yu, Lee Kraus, Benita Katzenellenbogen, Adam Nelczyk, Nicole Godellas, Shruti Vijay Bendre, Quang Nguyen, Hashni Epa Vidana Gamage, Anjana Asokakumar)

After a two-year hiatus due to the COVID pandemic, the MIP Annual Retreat returned! The retreat was held this October at the Illini Union, affording the MIP faculty, staff, and students a full day to socialize and hear about the amazing research being done in the department. This year's keynote addresses were delivered by MIP alumnus Dr. W. Lee Kraus, now a Professor of Obstetrics & Gynecology at UT Southwestern, and his former Ph.D. advisor, Dr. Benita Katzenellenbogen.

Dr. Kraus's seminar discussed recent work from his lab on ADP-Ribosylation. He also spent time discussing the importance of mentoring and provided advice for trainees. Dr. Katzenellenbogen provided a historical

and personal overview of her research and how her work interfaced with a nascent College of Medicine and growing Department of Physiology and Biophysics (as it was known when she first joined the department). The retreat also featured several excellent oral and poster presentations from students and postdocs from MIP labs as well as a scavenger hunt around campus!

Middle right photo: MIP Ph.D. students Anushna Sen, Quang Nguyen, Steven Hobbs, and Shruti Vijay Bendre

Bottom right photo: Steven Hobbs presents his poster to fellow MIP grad student Kenneth Samuel





## IN MEMORIAM: Professor Eric Jakobsson (1939-2021)

By Dr. Sameer Varma (PhD '05, biophysics and computational biology; Associate Professor, University of South Florida)



The last time I spoke with Dr. Jakobsson was a week before his passing. He was in a recovery room waiting for his physical therapist. After giving me a brief update on his health and spinning a positive web over it, we spent the next ten minutes discussing lithium biology and membrane proteins. He also asked me to send him a preprint of one of my lab's latest studies. He was intrigued by the new results that I shared with him and had suggestions for future directions. This conversation, although brief, was no different from the many that I have had with him ever since I was a Ph.D. student in his lab. Even in his last years, and despite his deteriorating health, he was still actively running simulations, devising new strategies to solve problems, and enthusiastically developing new course material.

There are times when you meet folk that you admire, and their success motivates you. But there are very few who not only inspire you through their achievements, but also take the time to help you in every possible way to achieve your own potential. To me and the many students and postdocs that he mentored over his long career at the University of Illinois at Champaign-Urbana, Dr. Jakobsson was the latter and our real hero — our "superman." We are truly fortunate to have had him as a mentor, colleague, and friend. During the celebration of his 80th birthday in 2018, I also learned that the positive impact that he had on us also extended to so many others inside and outside of academia. The Urbana community and academia worldwide will miss his him dearly, but his kindled spirit will live on through us.

## **PhD Graduates**

### Qiuyan Ma

(Bagchi Lab), "Role of Extracellular Vesicles (EVS) in Mediating Cell-to-Cell Signaling During Early Pregnancy"

### **Monika Makuraath**

(Chemla Lab), "Single Molecule Studies of Processes Involved in Genome Maintenance"

### **Daphne Eagleman Lodes**

(Tsai Lab), "Mechanisms of Translational Control by the Ubiquitin E3 Ligase Neuro Precursor Cell Expressed Developmentally down-regulated gene 4-Like, NEDD4-2"

## **2022 Student and Postdoc Awards/Fellowships**

Niraj Lawande (Christian-Hinman Lab) Howard S. Ducoff Award for Outstanding Senior Thesis in the Dept. of Molecular and Integrative Physiology | UIUC

### **Angelina Wilton**

(Chung Lab) C. Ladd Prosser Outstanding Achievement Award in the Dept. of Molecular and Integrative Physiology | UIUC

### **Jennifer Walters**

(Chung Lab) C. Ladd Prosser Graduate Student Research Award in the Neuroscience Program | UIUC

#### **Robbie Ingram**

(Christian-Hinman Lab) NIH Predoctoral Award "Epilepsy-Associated Dysfunction in the Kisspeptin-GnRH Neural Circuit."

## **2022 Newly Awarded Faculty Grants**

#### **Milan Bagchi**

NIH R21 | "Extracellular vesicles as mediators of cell-cell communication during implantation."

### **Catherine Christian-Hinman**

NIH R21 "Roles of neuroestradiol in comorbid hyperexcitability and seizure susceptibility in Alzheimer Disease."

### **Catherine Christian-Hinman**

American Epilepsy Society/Hope for Hypothalamic Hamartomas | "Developing a Mouse Model of Hypothalamic Hamartoma."

### Catherine Christian-Hinman (Yurii Vlasov, lead PI)

**NIH RF1** "Miniaturized silicon neurochemical probe to monitor brain chemistry."

### Benita Katzenellenbogen

**Breast Cancer Research Foundation** ("Genomic Profiling of the Estrogen Hormonal Pathway for Breast Cancer Prevention and Treatment."

Erik Nelson (Paul J. Hergenrother, lead PI) NIH R01 | "A Novel Therapeutic Strategy for Ovarian Cancer."

### Erik Nelson (Kai Zhang, lead PI)

Cancer Center at Illinois Seed Grant "Optogenetic modulation of the tumor microenvironment to improve cancer immunotherapy."

### Erik Nelson (Hua Wang, lead PI)

Cancer Center at Illinois Seed Grant | "Metabolic Tagging of Tumor Exosomes for Developing Enhanced Exosome Vaccines."

### Lori Raetzman

Campus Research Board | "Uncovering Notch signaling targets in pituitary stem cells."

### Patrick Sweeney

NIH R00 | "MC3R inhibition as a strategy to maintain weight loss in obesity."

### **Patrick Sweeney**

**Foundation for Prader-Willi Research** ("MC3R Inhibition as a Therapeutic Strategy for Treating Hyperphagia in Prader-Willi Syndrome."

### Nien-Pei Tsai

NIH R01 supplement | "Mechanism of Gp1 mGluR-dependent translation and plasticity."

## Selected MIP Papers (Nov. 2021-Oct. 2022)



Nguyen JT, Shaw RPH, & Anakk, S (2022). Bile Acids—A Peek Into Their History and Signaling. *Endocrinology*, 163(11).

Shaw RPH, Kolyvas P, Dang N, Hyon A, Bailey K, & Anakk S (2022). Loss of Hepatic Small Heterodimer Partner Elevates Ileal Bile Acids and Alters Cell Cycle-related Genes in Male Mice. *Endocrinology*, 163(6).

Zhou W, & Anakk S (2022). Enterohepatic and non-canonical roles of farnesoid X receptor in controlling lipid and glucose metabolism. *Mol Cell Endocrino*l, 549, 111616.

Sen A, Goforth M, Cooper KK, & Anakk S (2022). Deletion of constitutive androstane receptor led to intestinal alterations and increased imidacloprid in murine liver. *J Endocr Soc.* bvac145

Auerbach BD, Manohar S, Radziwon K, & Salvi R (2021). Auditory hypersensitivity and processing deficits in a rat model of fragile X syndrome. *Neurobiol Dis*, 161, 105541.

Liu X, Kumar V, Tsai NP, & Auerbach BD (2021). Hyperexcitability and Homeostasis in Fragile X Syndrome. *Front Mol Neurosci*, 14.

Auerbach BD, & Gritton HJ (2022). Hearing in Complex Environments: Auditory Gain Control, Attention, and Hearing Loss. *Front Neurosci*, 83.

Ma Q, Beal JR, Bhurke A, Kannan A, Yu J, Taylor RN, Bagchi IC, & Bagchi MK (2022). Extracellular vesicles secreted by human uterine stromal cells regulate decidualization, angiogenesis, and trophoblast differentiation. *Proc Natl Acad Sci USA*, 119(38).

Ma Q, Beal JR, Song X, Bhurke A, Bagchi IC, & Bagchi MK (2022). Extracellular Vesicles Secreted by Mouse Decidual Cells Carry Critical Information for the Establishment of Pregnancy. *Endocrinology*. Oct 11:bqac165.

Kim EC, Zhang J, Tang AY, Bolton EC, Rhodes JS, Christian-Hinman CA, & Chung HJ (2021). Spontaneous seizure and memory loss in mice expressing an epileptic encephalopathy variant in the calmodulin-binding domain of Kv7.2. *Proc Natl Acad Sci USA*, 118(51).

Ingram RJ, Leverton LK, Daniels VC, Li J, Christian-Hinman CA (2022). Increased GABA transmission to GnRH neurons after intrahippocampal kainic acid injection in mice is sex-specific and associated with estrous cycle disruption. *Neurobiol Dis* 172:105822.

Li J, & Christian-Hinman CA (2022). Epilepsy-associated increase in gonadotropin-releasing hormone neuron firing in diestrous female mice is independent of chronic seizure burden severity. *Epilepsy Res* 184:106948.

Cutia CA, Leverton LK, Ge X, Youssef R, Raetzman LT, & Christian-Hinman CA (2022). Phenotypic differences based on lateralization of intrahippocampal kainic acid injection in female mice. *Exp Neurol* 335:114118.

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