Building on Success

This year’s newsletter provides an excellent opportunity for us to reflect on our collective achievements over the past year and to peer into the future for the exciting prospects that lie ahead. According to the medical school’s metrics for excellence, which span from scholarship to education, IBP faculty and students performed at an outstanding level and we are in the top tier for the second consecutive year. Congrats to all for this outstanding achievement!

In the newsletter, you will find some of the key highlights from the past year. Some notable achievements include Dr. Alessandro Bartolomucci’s promotion from Assistant Professor to Associate Professor with tenure. Alessandro gets the additional great distinction of being the first IBP faculty member to attain promotion and tenure since the department’s formation in 2008. So a great “Minnesota Hats off to Thee” goes to Alessandro! As IBP continues to grow and flourish, we will certainly have many more of these celebratory events to enjoy in the years to come.

This past year IBP has significantly increased its interaction with the University of Minnesota Foundation (UMF) as a critical element to our future growth and success. Philanthropy has been emerging over the past years as an essential component of the three-legged stool, together with NIH, foundations, etc., in support of our collective research and discovery efforts. I am very pleased that UMF has directed two of their outstanding staff members toward IBP expressly to ignite our connections to friends of IBP and to grateful students and alums. Notably, Dr. DeWayne Townsend recently received a significant gift from the Jar of Hope Foundation to support his groundbreaking preclinical studies in muscular dystrophy. I am delighted that IBP is seeing tangible evidence of success in leveraging philanthropy to help propel discovery and that our program and faculty are included as key points of emphasis for the medical school and UMF.

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The IBP graduate students hosted the third annual Zukowska Lectureship in September. The invited speaker was Dr. Kathryn Sandberg, Professor and Vice Chair for Research in the Departments of Medicine and Physiology at Georgetown University in Washington D.C. Additionally, she serves as Director of the Center for the Study of Sex Differences in Health, Aging and Disease as well as the Translational Biomedical Science Program at Georgetown-Howard Universities. The title of Dr. Sandberg’s talk was “Hypertension: What’s sex got to do with it?”

Building on Success, continued

This new academic year also ushers in a key transition toward the continued growth and success of the IBP Graduate Program. Dr. John Osborn was instrumental in launching the new IBP Ph.D. program in 2009. With John's leadership the program has grown from its infancy into an outstanding graduate program in the medical school. We are indebted to John for all his efforts in establishing the IBP Graduate Program. Our graduate students routinely receive recognition for excellence as seen in the high success rate for IBP grad students receiving extramural fellowship awards. Starting this fall, Dr. Cathy Kotz took the Director of Graduate Studies baton from John and already has infused her own brand of exciting ideas and energy to continue the program’s vibrant upward ascent.

I am also thrilled to report that Dr. Kotz will be officially joining our faculty later this fall, which is great news for our department as we continue to grow our outstanding faculty. Welcome aboard Cathy!

IBP continues to enhance key ongoing partnerships across the medical school and university. This includes continued development of our ties to Cardiology and the Muscular Dystrophy Center, among many others. Over the past year, we formalized additional new ties with the Division of Endocrinology and Metabolism with Dr. Betsy Seaqquist's leadership. We are joining forces with Betsy to recruit outstanding new faculty to our units in the fields of obesity, metabolism and diabetes.

In addition, we recently joined forces with the U of M Center for Immunology under the leadership of Dr. Marc Jenkins. A faculty search has been initiated seeking faculty with outstanding training in immunology as applied to cardiovascular physiology and related fields. Collectively, these exciting new partnerships leverage excellence across campus to further advance IBP's mission of being a top tier program.

Enclosed you will also find snapshots of our annual marquee events, including the Visscher Symposium, Cardio-Palooza, the Zofia Zukowska Lectureship, and many others.

These are just some of the many accomplishments over the past year. As we look to the future, we see great opportunity ahead in 2017. Please visit the IBP Web site frequently for up-to-date announcements, accolades and kudos for our faculty, students and staff.

Looking forward to a great year ahead!

Sincerely,

Joseph M. Metzger
Maurice B. Visscher Endowed Chair in Physiology Professor and Head Department of Integrative Biology and Physiology
• In the course of the last year, IBP graduated two Ph.D. students: Evelyne Houang and Nathan Zaidman. Second year student, Carolina Ortiz Cordero, is working in the Perlingeiro Lab. Third year students Tanya Meyers (Townsend Lab), Kadambari Shekar (Yannopoulos Lab) and Amber Lockridge (Alejandro Lab) are working toward their oral exams this year.
• Ph.D. candidate Anthony Vetter received an AHA pre-doctoral fellowship award this year.
• Ph.D. candidate Tanya Meyers received the Lifson/Johnson Memorial Award recognizing excellence in physiology teaching by her students.
• Ph.D. candidate Nathan Zaidman received the Bacaner Research Award for exceptional research.
• Ph.D. candidate Amritha Yellamilli received the 2016-2017 Doctoral Dissertation Fellowship by the medical school.
• IBP also welcomed our newest graduate students: Naixin Zhang, Alexie Larson, and Michaela Jones (see right).

**IBP welcomes new DGS:**

Dr. Osborn has officially handed the baton to Dr. Catherine Kotz as the new Director of Graduate Studies in IBP. Cathy is an outstanding scientist working in the integrative biology of metabolism research area. Her lab is very well funded and her work is published in outstanding journals. She is highly visible in the field by serving on study sections, national society leadership, editorial boards and in speaking engagements nationally and internationally. IBP is fortunate to have someone of her stature and leadership skills in the role of DGS. Welcome Cathy!

**New Graduate Student Profiles**

**Naixin Zhang**

I grew up in China and graduated from Hunan University (China) in 2014 with a B.S. in Biotechnology. Then I went to Tufts University and finished my two-year master study majoring in Pharmacology. While I was there, I worked in Dr. Kopin’s lab where we characterized novel lipidated agonists of formyl peptide receptors (FPRs) and thus made them promising therapeutic candidates. After I graduated from Tufts, I chose to continue my graduate studies in the biomedical field in the IBP program of U of M and hope to get in-depth training on both lab work and theoretical knowledge.

**Alexie Larson**

I grew up in Baxter, Minnesota and graduated from the University of Minnesota Duluth in 2014 with a B.S. in Biology. Over the past year, I earned a M.S. in Molecular and Integrative Physiology from the University of Michigan. While I was at Michigan, I worked in Dr. Lisa Larkin’s lab where my primary focus was to study the effects of dexamethasone on our tissue-engineered skeletal muscle units. I chose to join the Integrative Biology and Physiology Graduate Program here at the U of M and plan to do research in the field of muscle physiology.

**Michaela Jones**

I was born and raised in Knightdale, North Carolina and in 2015 graduated from the University of Maryland Baltimore County with a B.S. degree in Biology. While at UMBC, I did research in Dr. Michelle Starz-Gaiano’s developmental biology lab investigating the role of the shep gene on border cell migration. Upon graduation, I completed a Post-Baccalaureate Research Education Program (PREP) at Virginia Tech. At VT, I worked with Dr. Tanya LeRoith to investigate the role of B and T Lymphocytes to further understand the pathobiology of Hepatitis E Virus.
The education mission of the Department of Integrative Biology and Physiology (IBP) focuses on physiology and anatomy classes aimed at undergraduate, graduate and professional students. For the year ending in June 2016, we offered more than 40 separate courses reaching over 3,000 students and yielding total revenue of over $6.1 million dollars, (including our January Short Courses for industry professionals). Our five full time teachers (Drs. Anderson, Barnett, Cook, Katz, and Weinhaus) are augmented with about a dozen additional faculty who teach part-time in IBP. In addition, the IBP research faculty all contribute to teaching, not to mention well over 50 student teaching assistants!

Our two medical school courses, Human Structure and Function (Anatomy) and Physiology, continue to place very well above the mean in each of 7 separate areas of medical school course comparisons. They placed first and second respectively in the most recent graduation questionnaire concerning course preparation for clerkships.

In 2014, we started a new program to prepare future physiology teachers for possible teaching roles in IBP and to provide advanced teaching experiences for our graduate students and post-docs who want to explore the rigors of teaching. Ninitha Asirvatham-Jeyaraj (Post-doc) was joined by Steven Wu (Research Associate) as part-time physiology teachers, and Dalay Olson (Post-doc) and Michelle Asp (Post-doc) completed their teaching efforts. We hope that some of these teachers blossom into full-time or part-time Physiology teachers, conceivably within IBP. In an analogous fashion, Jason Massey (anthropology graduate student) is acquiring valuable anatomy education experience.

The Undergraduate Physiology Society (UPS) kicked off the fall semester on Homecoming week, by providing a grilled hot dog lunch to students, faculty and staff on the Jackson Hall Church Street plaza. The informal meeting allowed freshmen who were contacted during the U’s welcome week to meet and mingle with the new slate of officers, upperclassmen and IBP staff and faculty. The officers were President: Kseniya Zeverva, Vice-President/ Treasurer: Alexandra Tsai, Historian/Photographer: An Nguyen, Public Relations Chair: Pragathi Paari, Social Media Chair: Rebecca Lorsung and Social and Philanthropy Co-Chairs: Julia Erkins and Drake Lindholm.

The kick-off event was followed by the U-PHYS students joining IBP faculty and staff on Friday for the Homecoming Parade! The students borrowed scrubs from the anatomy program for the parade and surprised parade watchers by handing out syringe-shaped pens and a variety of candies. The remainder of the fall semester was filled with Paint the Bridge and meetings centered on growing our undergraduate physiology community. During the winter break, the undergraduate major director, Vincent Barnett was part of a new initiative describing opportunities for pre-health students in the College of Liberal Arts (http://tinyurl.com/jfrka4). This program, along with Dr. Barnett’s participation in CLA “Sneak Peek” events for high school seniors, continues our promotion of the Physiology major as a gateway to health science careers.

Spring brought Regents approval for a new degree track for students interested in physiology, the B.A./M.D. degree. Selection will begin in fall 2017 for candidates eligible to complete both a B.A. in Physiology and a M.D. degree from the University of Minnesota in seven years. The first class will begin their studies in the fall of 2018.
IBP SPECIAL EVENTS

7th Annual Visscher Symposium – 2016

The 7th Annual Visscher Symposium was held May 31, 2016 featuring keynote speaker, Dr. Eric Olson of UT Southwestern. The title of his keynote was “Molecular control of heart development, disease and regeneration.” The auditorium in MMB 3-120 was filled to capacity for this event, which was followed by an evening reception and Young Investigator award ceremony.

Eric Olson, Ph.D.

SAVE THE DATE for the 8th Annual Visscher Symposium, featuring Dr. Jeffrey Friedman of Rockefeller University, June 6, 2017.

Jeffrey Friedman, M.D., Ph.D., is the Marilyn M. Simpson Professor and Head of the Laboratory of Molecular Genetics at the David Rockefeller University in New York City and a Howard Hughes Medical Institute Investigator. He received the Albert Lasker Basic Medical Research Award in 2010.

IBP AT THE STATE FAIR

IBP faculty, staff and graduate students helped with the “IBP Has Heart” exhibit at the State Fair again this year.

IBP, in collaboration with the Lillehei Heart Institute and Cardiology, led another highly successful cardiovascular retreat this past July, 2016. Cardio-Palooza 8 featured over 200 faculty, students and fellows in attendance at the CCRB. It featured 85+ posters and three short talks by young investigators representing both basic and clinical CV sciences.
Alumni Profile
Mark T. Marshall

Mark Marshall has been the Senior Principal R & D Engineer at Medtronic’s cardiac division since 1995.

He received his M.S. in Anatomy & Cellular Physiology from the U of MN in 2010. Last year, Mr. Marshall lectured in the Advanced Cardiac Anatomy and Physiology Course on the “Uses of Pacemaker for Treatment of Cardiac Arrhythmias.” He is the author of 24 patents in the area of medical lead implants in the heart and continues to work with leaders in research and industry on state-of-the-art pacemaker technology.

Dr. Catherine Kotz Joins IBP Faculty

Catherine, “Cathy” Kotz comes to us from the Department of Veterans Affairs in Minneapolis, where over the last 25 years she established a large research program focused on obesity and energy metabolism, and where she recently served as the Associate Director of Research for the Geriatric Research Education and Clinical Center. Cathy’s training and background is in basic science obesity research. For her Master’s degree in Nutrition, Cathy studied the microbiome in relationship to clindamycin-induced colitis, and the antibacterial effects of live culture yogurt. She then moved from the gastrointestinal tract to the brain for her Ph.D., where she studied neuropeptide regulation of feeding and energy expenditure, including effects on circulating hormones and enzymatic activity in white and brown adipose tissue. In her post-doctoral research, Cathy developed an interest in the neuropeptide orexin and her current grants (NIH and VA) are related to the role of orexin in body weight regulation, particularly physical activity related energy expenditure, and orexin effects on learning and memory during aging. (See photo, page 3). Welcome aboard Cathy!

FACULTY HIGHLIGHTS: Dr. DeWayne Townsend

This spring, Dr. DeWayne Townsend, Assistant Professor in IBP, was presented with the Jar of Hope Award by founder and CEO of the Jar of Hope Foundation, Mr. James Raffone (left). The Jar of Hope Foundation is an organization that supports scientific research seeking to find a cure for Duchenne Muscular Dystrophy, a devastating disease that causes severe muscle degeneration in boys. Dr. Townsend will use his award to fund pre-clinical studies in Duchenne Muscular Dystrophy.
The IBP Phenotyping Core is an Internal Service Organization (ISO) created to offer University of Minnesota faculty highly specialized equipment, surgical and technical expertise and data analysis capability in the area of metabolic and cardiovascular phenotyping and stress physiology (http://www.researchservices.umn.edu/services-name/integrative-biology-and-physiology-phenotyping-cores ). Alessandro Bartolomucci, Ph.D., is the Core Director, Pilar Ariza-Guzman, D.V.M., M.S., is Core Manager, and Maria Razzoli, Ph.D., is the Metabolism and Behavior Specialist.

The Core was launched in June, 2015 to offer a fee-for-service, state-of-the-art comprehensive range of metabolic and cardiovascular analysis, as well as surgical expertise for small rodents. In the first 12 months since its launch, the Core has served over 20 PIs affiliated with more than 10 different departments spanning three different schools at the U of Minnesota.

Major services include:

- Whole animal energy expenditure: Oxymax/CLAMS Lab Animal Monitoring System (Columbus Instruments, Columbus, OH).
- Echo-MRI 3-in-1 (Echo Medical Systems LLC, Houston, TX) delivers precise body composition measurements of fat, lean, free water, and total water masses in live mice.
- Automated Food Consumption and meal pattern analysis (BioDaq, Research Diets, Inc.).
- Cardiovascular functions in freely moving rodents using Data Science’s radiotelemetry system (Data Science International, St Paul, MN, USA).

The main Core facility is located in the Cardio-Cancer Research Building (CCRB), while select services are also available in Jackson Hall.
MISSION STATEMENT

Department of Integrative Biology & Physiology
University of Minnesota Medical School

Dedicated to an integrative systems biology approach to bio-medical discovery. We partner with colleagues across disciplines to investigate questions ranging from the gene/molecule to the intact animal, while striving for excellence in research and dissemination of new knowledge with local, national, and global impact.

Committed to mentoring and training graduate students and fellows.
We empower students to develop a deep understanding of the complexity of physiological systems to enable them to pursue unique career pathways spanning from academia to bio-industry.

Devoted to excellence, innovation and scholarship in education.
We educate undergraduate, graduate and professional students in the integration of structure and function of cells, organ-systems, and living animals, providing a strong foundation for knowledge discovery in basic science and human health fields.

Make a Gift to IBP

The generosity of individuals who recognize the importance of our department's work is indispensable to our success. Donate online at http://www.give.umn.edu/give/physiology.