**COVID-19**

CLICK HERE to read about Booster Shots. Hopkins encourages 3rd doses of COVID vaccines for all adults. Make an appointment for a booster through MyChart.

Johns Hopkins has moved to Phase 3 of reopening efforts, resuming higher-risk activities but still relying on distancing and mask-wearing in addition to providing online alternatives to in-person activities.

Universal masking: all personnel must wear masks in JHM facilities, regardless of vaccination status, unless alone in an office with the door closed.

Meetings and gatherings indoors and outdoors should not exceed 50 people. Food and drink should be individually wrapped in a "grab-and-go" fashion.

If you experience COVID-19 symptoms, call the Johns Hopkins COVID-19 Call Center at 443-287-8500 for evaluation and guidance.

**Physiology Newsletter**

**Welcoming women awarded for their scientific wins in the world:**

Hopkins hosts 2022 Kizzie Vallee Distinguished Lecture, includes Dr. Jen Plunzick on mentoring panel

Dr. Jen Plunzick
Physiology Faculty

On Tuesday, January 25, Johns Hopkins hosted the Kizzie Vallee Distinguished Lecture, Dr. Eva Nagales. This lecture was sponsored by the Valentine Foundation to highlight women’s major achievements in science and is named for Dr. Kizzie Vallee, who earned her EdD in 1952 and spent 27 years as a Professor at Lesley College, later serving as a Lecturer in Biocybernetics at Harvard University. Dr. Eva Nagales of the University of California at Berkeley gave a lecture entitled, “Structural Dynamics, and Regulatory Interactions in Large Human Transcriptional Complexes” which showcased the power of single particle Cryo-EM to reveal molecular function. For example, she outlined work from the Nagales Lab which solved the structure of the human SAGA complex, an evolutionarily conserved complex which contributes to chromatin modification, gene regulation, and repair of DNA damage. By comparing the structure of SAGA in humans and in yeast, her group identified similarities between the human and yeast complex - and, surprisingly, three conserved domains of functional elements between these two species.

In addition to the lecture, there were two Mentoring Panels featuring Dr. Eva Nagales along with women from the Johns Hopkins faculty, which included breakout sessions on topics such as Mentorship, Sustainability, and External Impact. One session was focused on networking the junior faculty years, and the other was focused on navigating the postdoc experience and becoming a PI. Despite the fact that this event was necessarily held on zoom (where else?), Dr. Hopkins’ science certainly captured the imagination, and the discussions of career development were engaging and interactive. Fun fact: past awardees of this prestigious lecturehip include Dr. Geraldine Seydoux of Johns Hopkins (2018).

Hello from the other side...of CMP recruitment

Manuella Ribas Andrade
1st Year CMP Graduate Student

A year later, I am getting to experience in-person interviews! But this time on the other side, helping plan and coordinate the events... As a first-year student, I remember very vividly the interview process, which I participated exactly a year ago from my bedroom. While I was warm and comfortable wearing slippers in my house in Boynton, Florida, I missed the excitement of being in a different city that could soon become my reality. As we learn how to live with the restrictions of this new reality with COVID-19, I am so glad we got to have this year’s interview weekend in person - one of the many perks from being a small program! It was definitely a different and unique experience of its own - from eating outside in 70°F weather (to follow Johns Hopkins’ requirements) to planning hybrid presentations and social events restricted to seven people. But I can confidently say we were able to successfully welcome eight people for in-person interviews in 2022.

The highlight of meeting the recruits in-person and learning about their research experiences was that it emphasized to me the great diversity and potential we have in this program. Even though it feels like I just arrived as a newby at Johns Hopkins, during recruitment weekend I was the one showing the campus and answering questions. It was a weird feeling, but it made me look back on what a great experience this first year has been – I get to meet many amazing, smart people, caring colleagues, and great mentors. I might not know how to get around using the tunnels yet, but I sure learned how to get to the closer coffee shops around. At the end, it was very easy to sell them our program and show how to make science fun!  

**Opportunities**

The 2022 Lasker Essay Contest opens February 9th. The Lasker Essay Contest engages early career scientists and clinicians from the US and around the globe in a discussion about big questions in biology and medicine and the role of biomedical research in our society today.

[1] list of grad student funding sources
[2] list of postdoc funding sources

[3] Welcome (back)!

[4] Contacts of each Physiology Laboratory team present short “fascinators” of their lab’s research to the prospective students.

[5] Photo courtesy of Manuella Ribas Andrade
Welcome back Dr. Shubhrajit Roy, Ph.D.

Shubhrajit obtained his B.S. and M.A. degree in Zoology from the University of Calcutta, India. He then pursued his Ph.D. in Neuroscience at the University of Calcutta under Prof. Jharna Ray and Prof. Kunal Ray, elucidating the molecular basis of Wilson disease, a copper metabolism disorder. Shubhrajit was offered several different scholarships in China, including the China National Doctoral Program (USIEF) in 2018, doing part of his thesis work under the supervision of Dr. Lutsenko. He returned to the Lutsenko lab as a postdoc fellow in December 2021. Currently, Shubhrajit is trying to understand the molecular mechanism associated with the regulation of copper transporters in the differentiation of intestinal stem cells. During his free time, Shubhrajit enjoys painting, reading books, cooking, listening to music and travelling.

Calendar

February is:

Black History Month

Starting with Gerald Ford, every U.S. president since 1976 has officially designated the month of February as Black History Month. The story of Black History Month begins in 1915, half a century after the 13th Amendment abolishing slavery in the U.S. That September, the Harvard-trained historian Carter G. Woodson and the prominent minister Jesse E. Moorland founded an organization dedicated to promoting the accomplishments of Black Americans and others of African descent, known today as the Association for the Study of African American Life and History (ASALH). That year, the group sponsored a national “Negro History week” in 1926, choosing the second week of February to coincide with the birthdays of Abraham Lincoln and Frederick Douglass. The event inspired schools and communities nationwide to organize local celebrations, establish history clubs and host performances and lectures.

Department Events

Feb 11: Department Research Seminar at Noon
Yi (Henry) Cheng
“PAC regulates macrophage function in bacterial infection”
Kevin Chen
“Endosomal PAC in neurons regulates synaptic plasticity”

LOCATION: WEST LECTURE HALL, GROUND FLOOR PCT
OR ZOOM

Feb 25: Department Research Seminar at Noon
Allatah Mekile
Yingzhi Yi

LOCATION: WEST LECTURE HALL, GROUND FLOOR PCT

March 4: Journal Club at Noon
IN-PERSON IN THE PHYSIOLOGY LIBRARY
Jessica Hernandez, Kevin Chen

Other Events

Feb 1: Lunar New Year

Feb 12: Groundhog Day

Feb 14: Valentine’s Day

March 1: Mardi Gras

Dr. Roger Reeves graduates from work!

Professor Reeves - now Professor chromium - successfully concluded his work at Johns Hopkins University, School of Medicine, on Dec. 31, 2021. Sort of.

As a postdoc, Reeves tirelessly faced some of the challenges adjusting to American culture. His photo courtesy of Roger Reeves.

From many cells in a random pattern at different stages of development. Although there were many publications based on this, the mosaic was never properly acknowledged in their assessments.

Mitsuo Ohkuma and colleagues were also making a model mouse with HA21. Their research took them far into the field of artificial chromosomes and in an amazingly absurd set of experiments, they succeeded in “storing the long HA21 (around some of the genes) as a mouse artificial artificial chromosome, moved it into mouse embryonic stem cells, from there to the testis and then to the mouse germ line at the same time, with state of the art reproductive techniques, it was moved into a background which we’ve transmitted. He contacted me about characterizing these “TA21CMC” mice, and I’m very happy to participate in this, publishing this work at the height (two hoops) of the pandemic.

In 2020, Mitsuo also mentioned that his group had succeeded in pushing HA21 into rat. We also collaborated on a study recently and his character assassination this past week, I want to say, was actually falsely accepted for publication on Dec 21, ten days before my retirement.

I stress that these models were all the result of extraordinary and productive collaborations within my lab and with many people in the small international research community. Contribution to animal models began with a focus on comparative mapping, and the characterization described in this study has a comparatively successful career.

2 years later, the project was completed by others essentially as a complete genome-identification project, but this required technological developments that did not exist when I attempted the project.

Dr. Roger Reeves graduates from work!

A collaborative work between the Rao and Claypool labs has been published recently, entitled “Secretory pathway Ca2+-ATPase SPCA2 regulates mitochondrial respiration and DNA damage response through store-independent calcium entry.” Golgi-secreatory pathway Ca2+-ATPase isoform SPAC2 plays a crucial role in Ca2+ homeostasis. Separately from its ATPase-dependent pumping activity, SPAC2 interacts with Orai1 ion channels to elicit robust Ca2+ entry at the plasma membrane. In the absence of SPAC2, or brief depletion of extracellular Ca2+ to block SICE, single and double stranded DNA breaks appeared, activating the ATM/ATR-p53 DNA damage response pathway. In collaboration with Dr. Claypool’s lab, they uncover an unexpected link between SICE, mitochondrial Ca2+ entry and mitochondrial respiration that is critical for protection against ROS-mediated DNA damage. One therapeutic implication is that elevated levels of SPCA2 confer cancer cell resistance to DNA damaging agents in receptor positive breast cancer. The first author of this work, Dr. Makena mentioned that “we describe novel pump-independent functions of SPCA2 that have far reaching cellular consequences for mitochondrial function, redox homeostasis, and DNA damage response.” He added, this study couldn’t be possible without Dr. Rao’s support during challenging times, and thanks to American Association of Cancer Research (AACR) and AstraZeneca for awarding the 2020 Breast Cancer Fellowship to carry out this project.

The work of Feng Gao is featured in a recent publication from the Reeves lab entitled “A transchromosomal rat model with human chromosome 21 shows robust Down syndrome features.” Progress in earlier
detection and clinical management has increased life expectancy and quality of life in people with Down syndrome (DS). However, no drug has been approved to help individuals with DS live independently and fully. Although rat models could support more robust physiological, behavioral, and toxicology analysis than mouse models during preclinical validation, no DS rat model is available due to technical challenges. Reeves group, by working with Kazuki lab (Tottori University) and other collaborators, characterized the first rat model of DS, TcHSA21rat, which contains a freely segregating and EGFP-labeled human chromosome 21 (HSA21) with >93% of its protein coding genes. TcHSA21rat exhibits learning and memory deficits and recapitulates well-characterized DS brain morphology, including smaller brain volume and reduced cerebellar size. In addition, the rat model shows reduced cerebellar foliation, which is not observed in DS mouse models. Moreover, TcHSA21rat exhibits anomalies in craniofacial morphology, heart development, husbandry, and stature. This work was published in the American Journal of Human Genetics. The co-first author of this work, Dr. Feng Gao mentioned that "TcHSA21rat is a robust DS animal model that can facilitate DS basic research and provide a unique tool for preclinical validation to accelerate DS drug development".