



UNIVERSITY OF GEORGIA

Research Opportunities at the University of Georgia for Visiting Undergraduate Students from Wuhan University

To promote scientific exchange, multiple research laboratories at the University of Georgia (UGA) offer research opportunities for current undergraduate students at Wuhan University. UGA, founded in 1785, is the birthplace of public higher education in America. It is one of the best public schools in the U.S. (2022 U.S. News Best National University Rankings #48), with historical strength in life sciences. UGA locates at Athens, GA, a safe and vibrant college town boasting sports, music, art, and foods. The city is just an hour's driving distance from the Atlanta, GA.

Application materials required:

- Transcript (minimum GPA of 3.2)
- TOEFL (minimum of 18 in all sections) or IELTS (overall band-width of 6.5, with no single band below 6.0) or Duolingo (105), or take an English test with the UGA Intensive English Program
- CV
- Select one to two UGA lab of preference and fulfill lab-specific requirements

A list of UGA research laboratories is as follows.

Dr. Pengpeng Bi Laboratory

Bi lab studies the molecular mechanism of muscle development and regeneration. Training opportunities under the direct guidance of Dr. Bi are immediately available to identify the novel genes that control the switch of myoblast fusion, a mysterious process that gives the remarkable syncytial form of muscle tissues that collectively account for around 40% of our body weight. This project will be based on recent breakthroughs from our continued efforts and accomplishments (Science, 2017; PNAS, 2017; PNAS, 2018; Science Advances, 2020; PLoS Genetics, 2021).

The unique strength of research tools in the Bi lab includes the versatile generation of genetically modified mouse (Genome Research, 2021) and human organoid models without relying on core facilities. This offers the valuable experience and maximal flexibility of performing significant and impactful biomedical research. Previous undergraduate trainees from Wuhan University have been awarded authorships on multiple papers and also the admissions into top-notch graduate programs and institutes including the University of Toronto. We are happy to schedule a Zoom meeting if you have any questions about our research or wish to learn more details on how we can support your success.

(Dr. Bi's email: pbi@uga.edu)

Lab-specific Requirements: None.

Lab website: <https://bilab.uga.edu/>

Dr. Houjian Cai Laboratory

Dr. Cai's lab is nested in the Department of Pharmaceutical and Biomedical Sciences, College of Pharmacy. The lab utilizes genetic, molecular, biochemistry, and cell biology approaches to study co/post-translational protein modifications. We have developed a novel strategy to encapsulate the CRISPR Cas9/sgRNA ribonucleoprotein (RNP) complexes into extracellular vesicles. The long term goal of this study is to manufacture extracellular vesicles to encapsulate CRISPR/Cas9 genome editing machinery for treatment of cancers. Please see the following reference.

- Joseph Andrew Whitley, Sungjin Kim, Lei Lou, Chenming Ye, Omar Awad Alsaidan, Essilvo Sulejmani, Jingwen Cai, Ellison Gerona Desrochers, Zanna Beharry, Catherine Bowes Rickman, Mikael Klingeborn, Yutao Liu, Zhong-Ru Xie, Houjian Cai (2022), Encapsulating Cas9 into extracellular vesicles by protein myristoylation, [Journal of Extracellular Vesicles](#), 11(4):e12196.

Additionally, my lab also discovered that protein myristoylation is associated with protein oncogenic activity and dietary effect in tumor progression. One ongoing project is to investigate how protein acylation regulates oncogenic signaling and tumor progression. High fat diets provide a tremendous source of fatty acids for the acceleration of oncogenic signaling. This project is to understand the molecular mechanisms behind, particularly in fatty acid metabolism, if and how high fat diets are associated with cancer progression. The lab use cell culture and animal models (mouse models) to study these biological processes. Dr. Cai could be reached by email: caihj@uga.edu

- Essilvo Sulejmani and Houjian Cai (2018) Targeting protein myristoylation for the treatment of prostate cancer, *Oncoscience*, 5(1-2):3-5 (mini-review).
- Sungjin Kim, Xiangkun Yang, Qianjin Li, Meng Wu, Leah Costyn, Zanna Beharry, Alicja Bielawska, Michael G. Bartlett, Houjian Cai (2017). Myristoylation of Src kinase mediates Src-induced and high-fat diet-accelerated prostate tumor progression in mice, [Journal of Biological Chemistry](#), 292(45):18422-18433. PMC5682955

Lab-specific Requirements: We will train you as long as you are highly motivated, ambitious, and willing to learn.

Dr. Hongxiang Liu Laboratory

The Liu Lab is in the headquarter of Regenerative Bioscience Center. We utilize genetic, molecular, biochemistry, and cell biology approaches (both in vivo and in vitro) to address fundamental issues regarding the development and maintenance of taste buds. (1) We have discovered a previously unrecognized stem/progenitor source that contribute primarily to the neuronal-like type III taste bud cells. Currently, we aim to localize these newly found taste bud progenitors and study the molecular regulation of cell differentiation. (2) We have demonstrated that early taste buds and surrounding non-gustatory epithelium share a common source of progenitors – homogeneous epithelial cells (Shh+Krt8+) of the tongue primordium, and during

early embryonic stages the cell fate is reversible. We strive to define the genetic programs or molecular signaling that control the cell fate. (3) We are expanding our research to include exploration of approaches for appetite control.

Lab-specific Requirements: highly motivated to learn and willing to handle mice.

Dr. Kaixiong Ye Laboratory

The Ye lab is a Human Genetics lab with a special interest in Human Nutrition. We strive to identify genetic variants that make each one of us unique in our nutritional requirements and risks of metabolic diseases. Our research employs computational and experimental methodologies from Evolutionary and Quantitative Genomics, Molecular Genetics, and Nutritional Sciences. The Ye lab is in the Department of Genetics and is also affiliated with the Institute of Bioinformatics at UGA. (Lab website: <http://yelab.genetics.uga.edu/>; Dr. Ye's email: kaixiong.ye@uga.edu)

Lab-specific requirements: We offer both computational and experimental research opportunities. For computational research, you are required to know at least one programming language (e.g., Python, R, Perl, or C). For experimental research, prior experience with molecular and cellular experiments are preferred.