Jiaze Liu

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Education

Cornell University, Ithaca, NY **May 2023 - July 2024 (Expexted)**
Weill Institute for Cell and Molecular Biology
Intern student co-hosted by **Prof. Scott D. Emr** and **Prof. Yuxin Mao**

Wuhan University, Wuhan, China **Sept. 2020 - July 2024 (Expexted)**
Hongyi Honor Class, College of Life Science
Major: Biological Science GPA: **3.91/4.00 (1/35)** TOEFL: 106 (out of 120)
Undergraduate researcher in lab of **Prof. Yanxun Yu**

Publication

Regulation of lifespan and proteostasis by sensory neural activity and CaMK, Ranran Zhao[1], Weiqi Ge[1], Weikang Xue[1], **Jiaze Liu,** Kaiqi Wang, Youngnam N. Jin* and Yanxun V. Yu* (In submission, preprint: https://doi.org/10.21203/rs.3.rs-3266506/v1, 1: co-first author)

Research Experiences

Structural Elucidation of adapter-diUbiquitin-E3 ligase Complex **May 2023-Present**
Lab of Prof. Yuxin Mao & Prof. Scott Emr Cornell University, Ithaca, NY

- Purified each subunit and reconstituted the E3 ligase-adapter complex.
- Optimized freezing condition for CryoEM.
- To address the challenge of small size of the complex, adapted protein fusion strategy and used filamentous actin as a fiducial marker to help particle picking.
- To overcome the relative flexibility of the complex and improve resolution, adapted GraFix, a gradient fixing method that use ultracentrifuge and glutaraldehyde to chemically crosslink the protein complex.

Exploring the neuronal circuit for ethanol sensing in *Caenorhabditis elegans* **July 2021-May 2023**
Lab of Prof. Yanxun Yu Medical Research Institute, Wuhan University

- Verified the phenotype that *C. elegans* displayed bidirectional ethanal chemotaxis under different salt concentrations.
- Discovered sensory neurons for ethanal, by performing chemotaxis essay with mutant strains defective in certain neuron, and strengthened this conclusion by rescue experiment and calcium imaging *(in cooperation).*
- Further characterized the function of each individual neuron by manipulating neuronal activity with chemical genetics and optogenetics *(in cooperation).*
- Explored the genetic basis of the phenotype by preforming chromosomal knockout and knockin using CRISPR/Cas9 system on two hits from a previous genetic screen.
- Investigated the implication of one conserved signaling pathway by rescuing a key pathway component within different neuron.
- Characterized the influence of temperature on IAA and ethanal sensing.

Exploring the role of cmk-1 and neural activity in longevity in *C. elegans* **July 2021-May 2023**
Lab of Prof. Yanxun Yu Medical Research Institute, Wuhan University

(Publication under review)

● Discovered the phenotype of lifespan extension of cmk-1 mutant under certain temperature, and excluded other nongenetic factors such as caloric restriction.

● To determine the neuronal basis behind the above phenotype, performed rescue experiment of cmk-1 and discovered the important neuron.

● Participated in calcium imaging and discovered a decrease in neuronal activity in the mutant.

● Participated in loss-of-function (optogenetic silencing) and gain-of-function (overexpression of a protein kinase which stimulate neurotransmitter release) experiments to verify the causal relationship between decreased neuronal activity and extended lifespan.

● Participated in sample preparation of whole body RNAseq and used reporter essay to varify the RNAseq result.

● Side Project: Essayed the effect of global neuronal activity decrease on longevity.

Honors & Awards

● Gold Award for **iGEM 2021** competition **Oct. 2021**

● Best Measurement Nomination for **iGEM 2021** competition **Oct. 2021**

● Top 10 students of Wuhan University (for **10 out of entire undergraduate students**, won this award as a member of iGEM team) **May. 2021**

● Merit student (for top 10% of students) **Sept. 2021**

● First class of Study Scholarship (for top 5% of students) **Sept. 2021**

● New Youth Pacesetter of Hongyi Honor College **June. 2022**

Skills

● **Abundant experience operating electron microscope (Talos Arctica, F200).**

● Proficient in Molecular cloning; Experiments concerning *C. elegance* such as transgenic *C. elegance* construction, behavior assay; mammalian cell culture; etc.

● Computer skills: C, HTML, CSS, Graphic Design, etc.