Jiaze Liu Resume

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Education

Cornell University, Ithaca, NY **May 2023-Present**

Weill Institute for Cell and Molecular Biology

Intern student co-hosted by **Dr. Scott D. Emr** and **Dr. Yuxin Mao**

Wuhan University, Wuhan, China **Sept. 2020-Present**

Hongyi Honor Class, College of Life Science

Major: Biological Science Cumulative GPA: **3.91/4.00 (1/35)** TOEFL: 106 (out of 120)

TA: Teaching assistant for *Biochemistry* and *Microbiology*

Undergraduate researcher in lab of **Dr. 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* (Under review)

Research Experiences

Intern Student, Lab of Dr. Yuxin Mao & Dr. Scott Emr **May 2023-Present**

Cornell University, Ithaca, NY

Structural Elucidation of adapter-diUbiquitin-E3 ligase Complex

● Purified each individual protein and reconstituted the E3 ligase-adapter complex.

● Optimized sample freezing condition for CryoEM, to get the most optimal ice condition on the grid.

● Fused my protein complex to an Actin Binding Domain and reconstituted the complex along with F-actin. To use the filament as a fiducial marker to help with particle picking, to overcome the challenge of the small size of the complex.

● Adapted GraFix, used glutaraldehyde to chemically crosslink my protein complex, to help to overcome the relative flexibility of the complex and improve resolution.

Undergraduate Researcher, Lab of Dr. Yanxun Yu **July 2021-May 2023**

Medical Research Institute, Wuhan University, Wuhan, China

Exploring the neuronal circuit for ethanol sensing in *Caenorhabditis elegans*

● Generated several transgenic *C. elegans* strains deficient in specific neurons by the expression of Caspase or miniSOG, and characterized ethanol sensing behavior in those strains, to find out the neurons implicated in ethanal sensing circuit.

● Obtained phenotypic rescued strains that can only sense signal through specific sensory neuron, by rescuing the expression of key ion channels required for sensation in mutant background, to verify the conclusion that 3 key neurons are the sensory neuron for ethanal sensing.

● Constructed strains that express ChR-2, gtACR-2, or HisCl within specific neuron, to use optogenetics or chemical genetics to manipulate neuronal activity, to further characterize the neuronal circuit for ethanal sensing.

● Obtained few worm strain to be used in calcium imaging.

● Preformed two consecutive rounds of chromosomal knockout using CRISPR/Cas9 system, targeting two different genes that has putative function in ethanal sensing, and performed behavior essay on the obtained strains. To find out the molecular basis behind ethanal sensing. And has also worked on the knocking-in of these two genes in wild-type background, but with no success.

● Constructed many transgenic strains that express a key protein in a signaling pathway in different neuron, and characterized their response towards ethanal, for phenotypic rescue that aims to find out the neuron in which this cell signaling pathway takes place and leads to ethanol chemo-sensation.

● Characterized the influence of temperature on IAA and ethanal sensing.

Exploring the role of cmk-1 and neural activity in longevity in *C. elegans* (Publication under review)

● Performed longevity essay on wild type and cmk-1 mutant strain under different temperature, to essay the effect of cmk-1 mutation on longevity under different conditions, and measured pumping rate of worms under different condition, to make sure the observed extended lifespan is not due to other factor such as caloric restriction.

● Molecular cloning for some of the plasmids used for rescuing cmk-1 in specific neuron, to determine the key neuron required for this cmk-1 dependent temperature influence on longevity.

● Did molecular cloning, microinjection, and processing image data for some of the strains used for calcium imaging, to essay neuronal response toward temperature change, to investigate the principle behind the influence of longevity by cmk-1.

● Constructed some of the strains used for optogenetic essays, to artificially manipulate excitation state in this key neuron, to see if artificially caused difference in neuronal activity can influence longevity.

● Also constructed strains that express gain-of-function PKC-1, which increase neurotransmitter release, or overexpress constitutively active cmk-1 in this key neuron, to further validate this hypothesis.

● Prepared some of the sample used for RNAseq, by picking transgenic worms raised under specific conditions. And processed some of the image data, to visually quantify some of the up- or down-regulated genes we discovered through the RNAseq.

● For another set of related experiment, backcrossed a mutant strain that lacks key ion channel required for signal transduction with wildtype, to eliminate background mutation, and further preformed longevity essay, to see the influence of global neuronal activity on lifespan.

● Rescued the abovementioned ion channel in individual sensory neuron and performed longevity essay, to discover the primary neuron that have an effect in longevity, and also used Cre-LoxP system to construct neuronal specific knockout strain.

Skills

● Have 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.

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 of Hongyi Honor College (for top 5% of students) **Sept. 2021**
- First class of Study Scholarship of Wuhan University (for top 5% of students) **Sept. 2021**
- New Youth Pacesetter of Hongyi Honor College **June. 2022**