Fuminori Tanizawa

UNDERGRADUATE STUDENT – Computational Biology

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EDUCATION

Harvey Mudd College Sep. 2021 - May 2025 (expected)
B.S. in Mathematical and Computational Biology (GPA: 3.88/4.00) Claremont, CA

- Selected Coursework: Molecular Genetics; Immunology; Evolutionary Biology; Developmental Biology; Math & CS Biology; Data Structures; Program Development; Differential Equations; Discrete; Environmental Analysis

PUBLICATIONS

2021 **Tanizawa, F.**, Takemoto, H. Sleep contributes to preference for novel food odours in *Drosophila melanogaster*. *Scientific Reports* 11, 9395 (2021)

EXPERIENCE

Scripps Research May 2023 – Aug. 2023
Neuroscience of C. elegans — Supriya Srinivasan, Ph.D. La Jolla, CA

Google Research Jan. 2023 – May. 2023
CS Research Mentorship Program — Albert Cohen, Ph.D. Online

National University of Singapore May 2022 - Aug. 2022
Evolutionary Development of B. anynana — Antonia Monteiro, Ph.D. Singapore, Singapore

Harvey Mudd College Dec. 2021 – Present
Molecular Genetics of D. melanogaster — Jae Hur, Ph.D. Claremont, CA

Japan Science and Technology Agency Jul. 2018 - Apr. 2021
Behavioral Biology of D. melanogaster — Hiroyuki Takemoto, Ph.D. Shizuoka, Japan

PROJECTS

Role of HAT Complex Protein EAF6 in Lifecycle Differentiation of *T. brucei* Sep. 2023 – Dec. 2023
Prof. Danae Schulz, Harvey Mudd College Claremont, CA

- Engineered an RNAi plasmid targeting the EAF6 gene in the HAT complex of *Trypanosoma brucei*, the parasite causing African sleeping sickness, to study its role in the parasite's lifecycle transitions, especially between Bloodstream and Insect forms.
- Electro-transformed an RNAi plasmid into *T. brucei*, incorporating an EP1-GFP reporter system to enable real-time monitoring of procyclin expression, encoded by the EP1 gene, as a proxy for lifecycle differentiation.
- Performed detailed flow cytometry to track EP1-GFP expression in *T. brucei*, uncovering EAF6's critical role in facilitating differentiation and indicating potential RNAi system leakage.

Genomic Regulators of Lipid Metabolism and Longevity in *C. elegans* May 2023 – Aug. 2023
Prof. Supriya Srinivasan, Scripps Research La Jolla, CA

- Constructed and cloned five rescue plasmids to explore a target gene's function, incorporating tissue-specific promoters, cDNA of interest, a fluorescent protein, and a UTR into the *pUC19* vector plasmid.
- Engineered a global knockout of a key gene, deleting all six exons (∼3,500 bp), designing the sgRNA and repair template with an EcoRI site, and screening using the *dpy-10* phenotype as a Co-CRISPR marker.
- Generated a worm strain by crossbreeding a gene mutation line with a rescue construct line of the target gene tagged with green fluorescent protein. Screened the crosses using PCR and microscopy.
- Conducted imaging of NeuroPAL line and GFP-tagged worm strains using an A1 Confocal Microscope.

Effects of Health on Mitochondrial Protein Degradation in *D. melanogaster* Dec. 2021 – Present
Prof. Jae Hur, Harvey Mudd College Claremont, CA

- Investigated the relationship between dietary stress (hormesis) and longevity in fruit flies
- Utilized biological tools such as genome analysis techniques (DNA isolation, qPCR, gene overexpression), mitochondrial protein degradation analysis, and various physiological assays (activity, longevity, and aspiration) to support the research
- Developed a compelling hypothesis on the relationship between protein degradation and longevity, and obtained statistically significant results in support of it

Inheritance of Learned Preferences for Host Plant Odors in *B. anynana* May 2022 – Aug. 2022
Prof. Antonia Monteiro, National University of Singapore Singapore, Singapore

- Selected as an Amgen Scholars Program participant at National University Singapore and performed fully-funded, full-time research (4% acceptance rate).
- Proposed and executed an evolutionary developmental analysis of food odor preference and its inheritance in *Bicyclus anynana*.
- Co-hosted the Asia Amgen Scholars symposium, orchestrated keynote speakers and presentations from four universities across three countries, and presented research findings.

Sleep Deprivation and Food Odor Preference in *D. melanogaster* Jul. 2018 – Mar. 2021
Prof. Hiroyuki Takemoto, Shizuoka Univeristy Shizuoka, Japan

- Selected as a high school scholar for fully-funded research by Japan Science and Technology Agency and carried out independent research in partnership.
- Conducted behavioral analysis of sleep and food odor preference in *Drosophila melanogaster* using unique self-made devices: a centrifuge for sleep deprivation and an infrared device to measure fly activity.
- Published first-authored, peer-reviewed paper on the international scientific journal *Scientific Report (Nature Publishers)* and orally presented research findings at the international Animal Behavior Society conference.

AWARDS & FELLOWSHIPS

Awards	Nov. 2020	**Grand Prize Winner, Minister of Education, Science and Technology Award**: Japan Science and Technology Agency National High School Student Research Presentation
	Aug. 2020	**Grand Prize Winner, Minister of Health, Labor and Welfare Award**: Japan National High School Student Biology Summit
Fellowships	2023	**Ben Huppe 14 Memorial Internships Fellowship** Summer Internship Aid. ($7K)
	2021 – 2025	**Tadashi Yanai Foundation** Full-ride scholarship. ($95K p.a.)
	2018 – 2025	**Masason Foundation** Research Grants. ($35K)
	2021 – 2023	**John and Miyoko Davey Foundation** Living-expenses. ($12K p.a.)

SKILLS

Languages	English & Japanese (Bilingual)
Programming Tools	Python, C++, Java, R, MATLAB, Mathematica, Arduino, HTML/CSS, LaTeX, Git
Biology Techniques	RNAi (Tet-On/Tet-Off), CRISPR-Cas9 (sgRNA & Repair Template Design, Genetic Screening), Plasmid Design, Gibson Assembly, PCR, qPCR, Gel Extraction, Miniprep, Transformation (Heat-shock, Electroporation), Western Blot, Microscopy (Multichannel, Nikon A1 Confocal)

Last updated: December 31, 2023