

# Fuminori Tanizawa

UNDERGRADUATE STUDENT – Computational Biology

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## EDUCATION

### Harvey Mudd College

B.S. in Mathematical and Computational Biology (GPA: 3.9/4.0; Dean's List all semesters)

Sep. 2021 - May 2025 (expected)

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

Neuroscience of *C. elegans* — Supriya Srinivasan, Ph.D.

May 2023 – Aug. 2023

La Jolla, CA

### Google Research

CS Research Mentorship Program — Albert Cohen, Ph.D.

Jan. 2023 – May. 2023

Online

### National University of Singapore

Evolutionary Development of *B. anynana* — Antonia Monteiro, Ph.D.

May 2022 - Aug. 2022

Singapore, Singapore

### Harvey Mudd College

Molecular Genetics of *D. melanogaster* — Jae Hur, Ph.D.

Dec. 2021 – Present

Claremont, CA

### Japan Science and Technology Agency

Behavioral Biology of *D. melanogaster* — Hiroyuki Takemoto, Ph.D.

Jul. 2018 - Apr. 2021

Shizuoka, Japan

## PROJECTS

### Role of HAT Complex Protein EAF6 in Lifecycle Differentiation of *T. brucei*

Prof. Danae Schulz, Harvey Mudd College

Sep. 2023 – Dec. 2023

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*

Prof. Supriya Srinivasan, Scripps Research

May 2023 – Aug. 2023

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*

Prof. Jae Hur, Harvey Mudd College

Dec. 2021 – Present

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*

Prof. Antonia Monteiro, National University of Singapore

May 2022 – Aug. 2022

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*

Prof. Hiroyuki Takemoto, Shizuoka University

Jul. 2018 – Mar. 2021

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

## SKILLS

Languages	English & Japanese (Bilingual)
Programming Tools	Python, C++, Java, R, MATLAB, Mathematica, Arduino, HTML/CSS, L <sup>A</sup> T <sub>E</sub> X, 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)