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; Developmental Biology; Mathematical & Computational Biology; Data Structures Program Development; Differential Equations; Environmental Analysis

PUBLICATIONS

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

RESEARCH EXPERIENCE

The Scripps Research Institute 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

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

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

Harvey Mudd College Aug. 2021 - Feb. 2022
Biophysics — Mark Ilton, Ph.D. Claremont, CA

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

RESEARCH PROJECTS

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

Biomechanics of Cone Snail Feeding Strikes Sep. 2021 – Feb. 2022
Prof. Mark Ilton, Harvey Mudd College Claremont, CA

- Developed a biophysical research project on the modeling of the Conus marmoreus injection latch, demonstrating strong skills in scientific research and collaboration.
- Engineered an energy efficient rail machine using dynamics of soft elastic solid movements, high-speed imaging, operational hardware and software, and presented the results as team leader at a department session, showcasing expertise in engineering and leadership.

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 Languages	Python, C++, Java, Racket
Programming Tools	R, MATLAB, Mathematica, Arduino, HTML/CSS, LaTeX, Git, Docker
Biology Techniques	**Molecular Cloning:** Plasmid Design (SnapGene), PCR, Gel Extraction, Gibson Assembly, Transformation, Miniprep
	CRISPR-Cas9: sgRNA & Repair Template Design, Genetic Screening
	Microscopy Multichannel Microscope, Confocal Microscope(Nikon A1)
	Animal Maintenance: Maintenance and Behavioral Assays of *D. melanogaster*, *C. elegans*, and *B. anynana*

Last updated: August 29, 2023