FUMINORI TANIZAWA

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EDUCATION

Stanford University — Stanford, CA
Ph.D. in Immunology — Sep 2025 – Present

Harvey Mudd College — Claremont, CA
B.S. in Mathematical and Computational Biology — Aug 2021 – May 2025
Concentration: Environmental Analysis — GPA: 3.93 / 4.00
Honors: High Distinction; Dean's List (all semesters); Departmental Honors in three departments: Biology, Computer Science, and Humanities, Social Sciences & the Arts; Mindlin Prize for Best Senior Thesis Research.

PUBLICATIONS

- **Tanizawa F**, Takemoto H. Sleep contributes to preference for novel food odours in *Drosophila melanogaster*. *Scientific Reports*. 2021 Apr 30;11(1):9395. doi: 10.1038/s41598-021-88967-1.

PRESENTATIONS

- **Tanizawa F**, So J., Beaver A., Singer L., Mugnier M. "Characterizing the Effect of the Extravascular Environment on *Trypanosoma brucei* Antigenic Diversity." *Johns Hopkins Career, Academic, and Research Experiences for Students Symposium*. Johns Hopkins School of Medicine, Baltimore, MD, July 2024.
- **Tanizawa F**, Liu C.C., Perez P.A., Srinivasan S. "Genomic Regulators of Lipid Metabolism and Longevity in *C. elegans*." *The 2023 Southern California Conference for Undergraduate Research*. California State University, Long Beach, CA, November 2023.
- **Tanizawa F**, Gowri V., Monteiro A. "Behavioral Effects of Odorant Injection on Larvae and Eggs of *Bicyclus anynana*." *2022 Amgen Scholars Asia Symposium*. National University of Singapore, Singapore, August 2022.
- **Tanizawa F**, Takemoto H. "Sleep Contributes to Preference for Novel Food Odours in *Drosophila melanogaster*." *The Animal Behavior Society Annual Meetings 2020*. The Animal Behavior Society, Virtual Conference, July 2020.

RESEARCH EXPERIENCES

Harvey Mudd College — Claremont, CA
Senior Thesis Student — Aug 2024 – May 2025
Mentored by Dr. Jae Hur, Department of Biology
Project: Mitochondrial Protein Degradation and Immune Response in *Drosophila melanogaster*

- Proposed and independently led a project investigating mitochondrial proteostasis and its role in immunity in *Drosophila*, leveraging recent Hur Lab findings.
- Characterized the role of mitochondrial matrix protease *ClpXP* in innate immune regulation using UAS/GeneSwitch-driven overexpression models in *Drosophila*.
- Designed and optimized immunological assays for *Drosophila*, including infection assay, antimicrobial peptide qPCR, cytokines profiling, and bacterial load quantification with antibiotic-resistant strains.

Johns Hopkins University — Baltimore, MD
Summer Undergraduate Research Fellow — May 2024 – Aug 2024
Mentored by Dr. Monica Mugnier, Department of Molecular Microbiology and Immunology
Project: Characterizing the Effect of the Extravascular Environment on *Trypanosoma brucei* Antigenic Diversity

- Investigated the role of the extravascular environment in driving antigenic variation and immune evasion in *Trypanosoma brucei*, a causative parasite for African sleeping sickness.
- Developed and optimized novel protocols for extracting extracellular fluid (EF) from key extravascular organs (heart, lungs, and gonadal fat) in *T. brucei*-infected mice using intravenous injections, cardiac puncture, and perfusion, followed by SDS-PAGE analysis.
- Performed ELISA on EF samples, identifying significantly reduced IgG/M antibodies levels, suggesting diminished

immune pressure in extravascular spaces as a potential driver of antigenic variation in *T. brucei*.

- Presented findings at the Johns Hopkins CARES Symposium with implications for understanding immune evasion in parasitic infections.

Harvey Mudd College Claremont, CA
Undergraduate Researcher Sep 2023 – May 2024
Mentored by Dr. Danae Schulz, Department of Biology
Project: Role of HAT Complex Protein EAF6 in Lifecycle Differentiation of *Trypanosoma brucei*

- Engineered an RNAi plasmid targeting EAF6, a chromatin-interacting protein within the HAT complex, to investigate its regulatory role in *Trypanosoma brucei* lifecycle transitions between bloodstream and insect forms.
- Transformed *T. brucei* with an EP1-GFP reporter system and RNAi construct to enable real-time monitoring of lifecycle differentiation under RNAi-induced conditions.
- Optimized flow cytometry protocols to quantify EP1-GFP expression, troubleshooting RNAi system leakage and confirming EAF6's critical role in facilitating lifecycle differentiation.

Scripps Research La Jolla, CA
Summer Undergraduate Research Fellow May 2023 – Aug 2023
Mentored by Dr. Supriya Srinivasan, Department of Neuroscience
Project: Genomic Regulators of Lipid Metabolism and Longevity in *C. elegans*

- Designed five rescue DNA constructs to investigate the role of the metabolic regulator *hlh-11* in *C. elegans*, incorporating tissue-specific promoters (neuron, coelomocyte, glia, intestine, hypodermis), *hlh-11* cDNA, a fluorescent protein, and a UTR for precise functional analysis.
- Engineered a global *hlh-11* knockout strain using CRISPR/Cas9, designing sgRNA and repair templates, and validated knockouts using the *dpy-10* phenotype as a co-CRISPR marker.
- Crossbred *hlh-11* knockout strain with GFP-tagged rescue constructs, confirming successful recombination through PCR and fluorescence microscopy, and demonstrated tissue-specific *hlh-11* expression for further analysis.

National University of Singapore Singapore, Singapore
Amgen Asia Scholar May 2022 – Aug 2022
Mentored by Dr. Antonia Monteiro, Department of Biological Sciences
Project: Behavioral Effects of Odorant Injection on Larvae and Eggs of *Bicyclus anynana*

- Conducted behavioral assays on the African butterfly *Bicyclus anynana* to explore the transgenerational inheritance of learned odor preferences, advancing the understanding of epigenetic mechanisms.
- Designed and executed experiments demonstrating that larvae acquire and transmit novel host plant odor preferences, providing insights into the heritability of learned behaviors.
- Provided evidence of learned preference transmission across generations, contributing to the Monterio Lab's projects in ecological speciation and host plant adaptation.

Japan Science and Technology Agency Shizuoka, Japan
Visiting High-School Student Jul 2018 – Apr 2021
Mentored by Dr. Hiroyuki Takemoto, Research Institute of Green Science and Technology
Project: Sleep Contributes to Preference for Novel Food Odours in *Drosophila melanogaster*

- **First-author publication in *Scientific Reports***, presenting research on the role of sleep deprivation in sensory-driven behaviors of *Drosophila* at the International Animal Behavior Society conference.
- Proposed and led an independent project for two-years, conducting comprehensive behavioral studies to examine the influence of sleep on olfactory food preferences in *Drosophila*.
- Designed and constructed custom apparatus, including a two-choice odor box, a sleep deprivation centrifuge, and an infrared activity monitoring system, to investigate the role of sleep on olfactory-driven behaviors in *Drosophila*.

TEACHING EXPERIENCES

Harvey Mudd College Claremont, CA
Teaching Assistant and Grader, BIOL046 Introduction to Biology Jan 2023 – Spring 2025

Teaching Assistant and Grader, BIOL113 Molecular Genetics Sep 2023 – Fall 2024
Teaching Assistant and Grader, MATH055 Discrete Mathematics Sep 2024 – Fall 2024
Teaching Assistant, CSCI060 Principles of Computer Science Sep 2024 – Fall 2024
Writing Fellow, Biology Department Writing Program Sep 2024 – Spring 2025
Teaching Assistant and Grader, CSCI005 Introduction to Computer Science Spring 2025 – Spring 2025

HONORS & FELLOWSHIPS

Academics
Dean's List, Harvey Mudd College 2021 – 2025

Research
Johns Hopkins University BSI-SIP Scholar May 2024
National University of Singapore Amgen Scholar May 2022
Grand Prize Winner, Japan Science and Technology Agency National Research Presentation Nov 2020
Grand Prize Winner, Japan National High School Student Biology Summit Aug 2020

Fellowships
Ezoe Memorial Recruit Foundation — Full-Ride Ph.D. Fellowship ($95,000/year) 2025–2027 (2030)
Tadashi Yanai Foundation — Full-Ride Undergraduate Fellowship ($115,000/year) 2021–2025
Masason Foundation — Full-Ride Secondary Education Fellowship 2018–2025
Ben Huppe '14 Memorial Fellowship — Summer Research Grant ($7,000) 2023
Google Research — CS Research Mentorship Fellow 2023
John and Miyoko Davey Foundation — Living Support Award 2021–2023

TECHNICAL STRENGTHS

Computational Tools
Proficient in R, Python, MATLAB, C++, Java, Git, HTML/CSS, LaTeX, and BLAST, with experience in statistical modeling, data visualization, and custom bioinformatics pipelines.

Molecular and Cellular Techniques
DNA Cloning and Assembly: PCR, plasmid design, gel extraction, Gibson assembly, heat shock transformation.

Gene Perturbation Methods: CRISPR-Cas9 (sgRNA and HDR template design), inducible RNAi (Tet-On/Tet-Off, UAS/GeneSwitch).

Protein and RNA Analysis: Western blotting, ELISA, RT-qPCR, immunoprecipitation, SDS-PAGE, BCA assay.

Cell and Imaging Methods: Flow cytometry, immunofluorescence, confocal microscopy.

Model Organism Experience
***Trypanosoma brucei*:** Parasite culture, electroporation, RNAi-based gene silencing.

***Drosophila melanogaster*:** Husbandry, bacterial infection models, AMP expression assays, lifespan and behavioral phenotyping, mitochondrial function, proteostasis assays.

***Caenorhabditis elegans*:** Lifespan analysis, immunofluorescent screening, basic genotyping.

***Mus musculus*:** Handling, IV/IP injections, blood collection, cardiac puncture, perfusion, tissue harvesting.

***Bicyclus anynana*:** Behavioral assays, neural tissue dissection, sex-specific phenotyping.

Languages
English and Japanese (bilingual)