Samantha Graham

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EDUCATION

PhD Molecular, Cellular, Developmental Biology and Genetics — In Progress
University of Minnesota – Twin Cities — Expected Summer 2025
Minneapolis, MN

BS Quantitative Biology - University of Southern California — May 2020
Cum Laude
Los Angeles, CA

RESEARCH EXPERIENCE

Ran Blekhman Lab and **Frank Albert Lab** — August 2020 – Present
PhD Candidate - University of Minnesota

- Collaborated to generate the largest publicly available dataset of uniformly processed human gut microbiome data (data is available at MicroBioMap.org)
- Analyzed global geographic patterns in gut microbiome diversity
- Regular use of bioinformatic tools and high performance computing cluster
- Currently implementing a deep learning framework to distinguish between diseased and healthy samples based on microbiome composition
- Use of Python, R, and C++ programming languages for analyses

Scott E. Fraser Lab, University of Southern California — January 2018 – May 2020
Undergraduate Research Assistant

- Studied gene regulation in heart development in a zebrafish model system
- Tested the role of putative genetic enhancers in heart development
- Examined the activity of lncRNAs in developing embryos
- Generated transgenic zebrafish lines using embryo microinjection technique

MANUSCRIPTS

Submitted Manuscripts

Integration of 168,000 samples reveals global patterns of the human gut microbiome.
Abdill R.J.*, **Graham S.P.*,** Rubinetti V., Albert F.W., Greene C.S., Davis S., Blekhman R.
doi: https://www.biorxiv.org/content/10.1101/2023.10.11.560955v1 (Accepted at *Cell,* anticipated publication February 2025)
*Equal contribution

PRESENTATIONS

Oral Presentation July 2024
Intelligent Systems for Molecular Biology Montreal, Canada
The Human Microbiome Compendium: Processing and analysis of 168,000 human gut microbiome samples

Poster Presentation May 2024
UMN Biomedical Research Recognition Day Minneapolis, MN
Processing and Analysis of 168,000 human gut microbiome samples

Poster Presentation April 2024
UMN Research Computing Symposium Minneapolis, MN
Processing and Analysis of 168,000 human gut microbiome samples

Poster Presentation May 2023
Biology of Genomes Conference Cold Spring Harbor, New York
Integration of 170,000 samples reveals global patterns of gut microbiome diversity

HONORS AND AWARDS

Robert K. Herman Student Award October 2024
This award is given to one student in the MCDB&G PhD program to recognize high quality research and the best performance in the field of genetics

Ray C. Anderson Zoology and Genetics Fellowship June 2024
This fellowship is awarded annually to a PhD student pursuing research in genetics or zoology at the University of Minnesota.

Provost Undergraduate Research Fellowship Summer 2019
A fellowship and stipend given to undergraduate students to fund summer research

Dean's List Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020
Award given to students who have a GPA above 3.5 in the given semester

TEACHING EXPERIENCE

Teaching Assistant, Bioinformatic Analysis (GCD 3485) Summer 2022
University of Minnesota

- Acted as TA for a course exploring online bioinformatic tools used for genome analysis
- Led lecture on QTL mapping
- Answered student questions and helped explain course material
- Organized student assignments and provided feedback to students

Teaching Assistant, Personal Genome Analysis (GCD 3486) Spring 2022
University of Minnesota

- Acted as TA for a course exploring analysis of personal 23andMe data
- Wrote Python and R scripts for student use to analyze their genetic data
- Curated annotated set of human genetic variants for student use
- Taught a class on use of high-performance computing in bioinformatics
- Organized student assignments and provided feedback to students
- Answered student questions and helped explain course material

SERVICE

Biology Saves the World, University of Minnesota
Focus Scientist, Spring 2024
All first-year undergraduate students in the College of Biological Sciences (CBS) participate in a semester-long project called Biology Saves the World. I served as a Focus Scientist for a group of 10 undergraduates, where I met with them multiple times and discussed my research and career path with them. The project culminated in their presenting a poster on the work that we discussed.

UROP Reviewer, University of Minnesota
Reviewer, Fall 2023
The Undergraduate Research Opportunities Program (UROP) provides University of Minnesota undergraduates the opportunity to gain research experience. I served as a reviewer for UROP applications, where I read and scored several students' applications.

COGS Grant Review Committee, University of Minnesota
Reviewer, Fall 2023
The Council of Graduate Students (COGS) funds grants for conference travel, career development, and research support. I served as a reviewer for the COGS Grant Review Committee, where I read and scored 8 grant applications for the Fall 2023 application period.

College of Biological Sciences (CBS) Outreach, University of Minnesota
Session Leader, 2021 - Present
As part of CBS Outreach's mission to bring science to the general public, I created a science experiment to be conducted at Farmers Markets. In the session, I walk children through a DNA extraction experiment using household materials. The goal is to increase interest in science and make science accessible to people of all backgrounds.

USC Quantitative Biology (QBIO) Mentorship Program
Program Organizer & Mentor, 2019 - 2020
Created mentorship program to support underclassmen students; mentored four first-year Students.

REFERENCES

Frank Albert, PhD
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Associate Professor
Division of the Biological Sciences
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