Janelle Arnold

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Education

University of California Santa Barbara, Santa Barbara, CA — Expected Sep. 2028
PhD, Chemical Engineering — **GPA:** 3.79
Advisers: Michelle O'Malley and Carolyn Mills
Thesis: "Developing a Cell-Free Protein Expression Platform for Anaerobic Gut Fungi"

Princeton University, Princeton, NJ — May 2023
B.S.E, Chemical and Biological Engineering — **GPA:** 3.63

Honors & Awards

ExFAB Fellow, UCSB — 2025
Racial Justice Fellowship, UCSB — 2023
NSF Graduate Research Fellowship — 2023
Joseph Clifton Elgin Prize, Princeton School of Engineering — 2023
Michelle Goudie '93 Senior Thesis Award, funded by DuPont Co. — 2023
Lanzante Southwest Airlines Scholar — 2020, 2021, 2022, 2024

Research Experience

Cell-Free Protein Synthesis in Anaerobic Gut Fungi, UCSB — Jan. 2024 – Present
- Independent PhD project co-advised by Prof. Michelle O'Malley & Prof. Carolyn Mills
- Developing a high throughput screening platform for novel anaerobic enzymes
- Anaerobic gut fungi contain CAZymes of interest for lignocellulosic biomass degradation

Novel Gene Editing Technology in Extreme Thermophiles — May 2022 – May 2023
- Independent Senior Thesis at Princeton University
- Introducing thermostable CRISPR-Cas9 machinery into *C.bescii's* genome
- *C. bescii* is used in industrial biofuel production to degrade lignocellulosic feedstock

Advanced Materials Science NSF REU, Clemson University — May 2021 – July 2021
- Modeled the effects of evaporation on molecular bottlebrush aggregation in thermoplastics
- Simulated various conditions 500+ hours using LAMMPS on supercomputing cluster

High Meadows Environmental Institute Researcher, Princeton — June 2020 – Dec. 2020
- Investigated genetic make-up of soil microbial communities in low nutrient environments
- Used bioinformatic tools and command-line programming to perform metagenomic analyses
- Prepared 15-minute oral presentation at AGU Fall conference to share findings

Voelcker Biomedical Research Academy, UT Health Science Center — June 2016 – Jan. 2019
- **Co-author:** "Molecular architecture of the antiophidic protein DM64 and its binding specificity to myotoxin II from Bothrops asper venom," *Frontiers in Molecular Biosciences, 2022*
- Researched the anti-viral properties of TRIM5α in relation to the production of ubiquitin and HIV

Mentorship Experience

ExFAB Masters Summer Scholars Research Mentor — June 2025 – August 2025
Chemistry Undergraduate Research Mentorship Program — Jan. 2025 – Present
Society of Women Engineers Graduate Student Mentor — Oct. 2023 – Present
Head Chemistry Tutor, Princeton University Tutoring Center — Sept. 2020 – May 2023
Peer Academic Adviser, Princeton University — July 2021 – May 2023
- Advised 40 incoming freshman on how to enroll in courses, manage workloads, and apply for internships throughout the academic year
- Gained strong interpersonal skills and understanding others from diverse backgrounds

Advising Fellow Leadership Team, Matriculate at Princeton — Jan. 2020 – June 2022
- National non-profit organization offering free advising to low-income high school students during the college application process
- Mentored 6 students over 3 years, expanded impact by serving on leadership team, recruiting, and training the next cohort of advisers

Leadership

Vice President; SACNAS Graduate Chapter at UCSB — Sept. 2024 – Present
Society for the Advancement of Chicanos/Hispanics & Native Americans in Science

Communications Chair; SHPE Princeton Chapter — May 2022 – May 2023
Society of Hispanic Professional Engineers

Class Representative for Diversity, Equity, & Inclusion Committee — April 2022 – May 2023

Conferences

Arnold, J.D., Mills, C.E., and O'Malley, M. Developing a Cell-Free Protein Expression Platform for Anaerobic Gut Fungi. 3rd Cell Free Systems Conference. Evanston, IL. Aug. 2025.

Arnold, J.D., Mills, C.E., and O'Malley, M. Developing a Cell-Free Protein Expression Platform for Anaerobic Gut Fungi. American Chemical Society (ACS) Spring meeting. San Diego, CA. March 2025.

Arnold, J.D., Mills, C.E., and O'Malley, M. Developing a Cell-Free Protein Expression Platform for Anaerobic Gut Fungi. Biochemical and Molecular Engineering XXIII: Accelerating Biotech Solutions to aid a Changing World, ECI meeting. July 2024.

Arnold, J.D. and Conway, J.M. Implementing CRISPR-Cas9 Genetic Tools in Extremely Thermophilic, Lignocellulose Degrading *Caldicellulosiruptor bescii.* American Institute of Chemical Engineers (AIChE) Annual Meeting. Phoenix, AZ. November 2022.

Arnold, J.D., Garvin, Z.K., Kennedy, M., and Onstott, T.C. High-Affinity Trace Gas Oxidation by Soil Microbes Reflected in Gene Distributions Around Chilean Hot Springs in the Andean Altiplano. **Oral Presentation.** American Geoscience Union (AGU) Fall Meeting December 2020.

Skills

- Proficient in Linux, MATLAB, Excel, and Microsoft Office Programs
- *Lab:* Anaerobic Technique, Cell-Free Protein Synthesis, Cloning, PCR, Protein Purification, DNA Purification, Genetic Engineering, Data Analysis, Metagenomic Analysis
- *Automation:* Acoustic liquid handling (Echo 525)

Teaching Experience

- ChE184A: Senior Design of Chemical Processes; Winter 2025
- ChE126: Non-Newtonian Fluids, Soft Materials & Chemical Products, Fall 2025