Virginia Jiang

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Education

Princeton University, PhD, Chemical and Biological Engineering — Sept 2023-pres
- Advised by Dr. Jerelle Joseph and Dr. Jose Avalos

Columbia University, School of Engineering and Applied Sciences — May 2021
- BS, Chemical Engineering, *magna cum laude*
- Dean's List, Fall 2018 – Spring 2021 — GPA: 4.00

Research Experience

Scientific Associate, DE Shaw Research — June 2021-Sept. 2023.
Advisor: Dr. Qi Wang
- Computed high-throughput screens on supercomputer to triage ligands for drug discovery using molecular dynamics simulations, free energy perturbation, and other associated tools
- Conducted investigations into nucleic acid-protein interactions in systems like CRISPR-Cas9 through long-timescale, large-scale molecular dynamics simulations

Researcher, Protein and Metabolic Engineering, Columbia University — June 2018- June 2021
Advisor: Prof. Scott Banta
- Developed modeling pipeline for transmembrane and membrane-embedded proteins that act as a biological wire to create self-regenerating batteries from iron
- Managed team of undergrads to design molecular binding interfaces for protein purifications

Researcher, Rosetta Commons NSF REU — May – Aug. 2020
Advisor: Prof. Scott Banta and Prof. Sagar Khare
- Use Rosetta techniques to develop new tools to model membrane beta barrel proteins from homology
- Apply membrane protein frameworks to study pharmacological target proteins in SARS-CoV-2

Researcher, NSF REU at Northwestern Center for Synthetic Biology — May – Aug. 2019
Advisor: Prof. Keith Tyo
- Designed cloning method to produce 1061 mg/L mevalonate from lignin monomers in ADP1
- Assayed mevalonate production using GCMS and LCMS

Student Researcher, Center for Sustainable Development, Atenas, Costa Rica — Jan. - May 2019
Advisor: Prof. Achim Hager
- Conducted a longitudinal study on carbon sequestration in shade-grown and conventional coffee farms
- Concluded biodiversity correlated with higher levels of carbon storage and presented findings to the local community

Intern, Metropolitan Museum of Art Department of Scientific Research — May 2018- Jan 2019
- Analyzed oil-protein interfaces in components of egg tempera paints using spectrometry and ELISA,
- Developed ML model for paint in different curatorial atmospheres

Teaching Experience

Teaching Assistant, Columbia University — Sept. 2018 – June 2021
- Direct first-year undergraduate chemical engineering laboratory course by emphasizing creative design
- Implement student-centered learning practices to teach abstract data manipulation techniques

Grants and Awards

- Gordon Wu Fellowship
- NSF Graduate Research Fellowship
- Columbia SEAS Student Activities Award, National Residence Hall Honorary Student of the Year Award, King's Crown Leadership and Excellence Award in Civic Responsibility, Omega Chi Epsilon honors (awarded by Columbia University, 2021)

- Chemical Engineering Magazine Nicholas Chopey Scholar (awarded 2020)
- Tau Beta Pi Fellowship (awarded 2020)

Publications

Jung H, **Jiang V,** Su Z, Inaba Y, Khoury F, Banta S. "Overexpressiong of a Designed Mutant Oxyanion Binding Protein ModA/WtpA in *Acidithiobacillus ferrooxidans* for Low pH Recovery of Molybdenum and Rhenium." *JACS Au.* July 2024.

Jiang V, Lucia M, Banta S, Chen, CVHH. "A Remote, Hands-On, and Low-Cost Sourdough Lab for First-Year Chemical Engineering Students." *Chem. Eng. Education.* Sept 2023

Willett E, **Jiang V,** Koder RL, Banta S. "NAD+ Kinase Enzymes Are Reversible, and NAD+ Product Inhibition Is Responsible for the Observed Irreversibility of the Human Enzyme." *Biochemistry*. Sept. 2022

Jung H, Inaba Y, **Jiang V**, West AC, Banta S. "Engineering Polyhistidine Tags on Surface Proteins of *Acidithiobacillus ferrooxidans*: Impact of Localization on the Binding and Recovery of Divalent Metal Cations." *ACS Appl Mater Interfaces.* Mar. 2022

Jiang V, Khare SD, Banta S. "Computational structure prediction provides a plausible mechanism for electron transfer by the outer membrane protein Cyc2 from *Acidithiobacillus ferrooxidans*." *Protein Sci.* Aug. 2021

Arvay E, Biggs BW, Guerrero L, **Jiang V**, Tyo K. "Engineering *Acinetobacter baylyi* ADP1 for mevalonate production from lignin-derived aromatic compounds." *Metab Eng Commun.* May 2021.

Selected Presentations

Jiang V, Wang Q, Shaw D. Molecular dynamics simulations of CRISPR-Cas9 DNA encounter complexes. 2023. In RNA Society Annual Meeting.

Jiang V, Lucia M, Golla D, Khoury F, Banta S. Computational design for the lengthening and widening of beta roll-forming peptides for emerging biotechnology applications. In 2021 AIChE Annual Meeting. AIChE.

Leadership and Outreach Experience

Volunteer, BioBus June 2021-pres.
- Engaged elementary school students from historically marginalized backgrounds in STEM through participatory science enrichment activities

Leader, DESRES Identities/Orientations June 2021-pres.
- Organized resume reviews for undergraduate students from historically marginalized backgrounds to improve our recruiting pipeline
- Spoke to pre-college students at MIT's Introduction to Technology, Engineering, and Science summer program about my personal journey to STEM

Remote Lead, Rosetta Code Camp May-June 2021
- Helped to facilitate a one-week Rosetta protein modeling and Python bootcamp for forty REU and postbacc participants who had no prior exposure to the software

Queer/ Trans Advisory Board, Office of Multicultural Affairs Sept 2017-May 2021
- Launched and analyzed survey of LGBTQ+ student life to provide quantitative data to university deans
- Partnered with the World Health Organization and Columbia University's Office of University Life
- Curate recommendations for policy changes and initiatives to improve LGBTQ+ health on campus

President, Queer & Asian Sept 2017-May 2021
- Directed planning and execution of events and managed club social media, saw 4-fold increase in attendance

Volunteer, UndoCU Sept 2017-May 2021
- Taught undocumented high school students from the greater NYC area about college preparedness

Teen Trends Analyst, MTV July 2015-Jan. 2021
- Analyzed media to discover content from LGBTQ+ creators and reviewed pilots for viability

Skills

- Knowledgeable with MD, Python, bash, R, XML scripting, PyRosetta, and Rosetta (C++)
- Selected wet lab techniques: PCR, RD, gels, bacterial cell culture, cloning, flow, bioreactor design and operation, ELISA, LCMS/GCMS, UV-spectrometry