

Audrey Shih

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EDUCATION

Stanford University

Ph.D., Chemical Engineering – TA for *Mechanics of Soft Matter: Rheology* (CHEMENG 470)
M.S., Chemical Engineering

Stanford, CA

Expected June 2025
2020-2023

Princeton University

B.S.E., Chemical and Biological Engineering, minor in Materials Science and Engineering

Princeton, NJ

2016 – 2020

RESEARCH EXPERIENCE

Stanford University, Stanford, CA

October 2021 - Present

Doctoral Researcher | Gerald G. Fuller

- Designed portable magnetic stress rheometer costing \$160 for use in clinical settings to predict flow during abscess drainage procedures, allowing for physicians to tailor treatment plans
- Engineered 3D bioprinting systems for rheological characterization to elucidate crosslinking kinetics of bioinks, enabling optimization of mechanical properties in patterned biological tissues

Stanford University, Stanford, CA

March 2021 – October 2021

Doctoral Researcher | Joseph M. DeSimone

- Developed and optimized high resolution 3D continuous liquid interface production (CLIP) through experiments and simulations of optics and photopolymerization transport and kinetics
- Co-authored patent on additive-manufactured lattice microneedles for drug delivery

Princeton University, Princeton, NJ

September 2018 – May 2020

Undergraduate Researcher | Sujit S. Datta

- Investigated elastic instabilities in polymer flow through stereolithographic model porous media
- Independent thesis work featured in [profile article by the School of Engineering and Applied Science](#)

Princeton University, Princeton, NJ

June 2017 – June 2018

Undergraduate Researcher | Celeste M. Nelson

- Analyzed role of tissue mechanics in epithelial-mesenchymal transition (EMT) using immunostaining

SELECTED AWARDS

2023	Chemical Engineering Department Service Leadership Award
2021	Judges' Vote and Audience Choice poster awards, Stanford MIPS Retreat
2020	National Science Foundation (NSF) Graduate Research Fellowship
2020	Lore von Jaskowsky Memorial Prize, Princeton School of Engineering and Applied Sciences
2020	Materials Science and Engineering Department Outstanding Senior Thesis Award

PUBLICATIONS AND PATENTS

- Shih, A.**, Chung, S. J., Shende, O. B., Herwald, S. E., Vezeridis, A. M., Fuller, G. G., Viscoelastic measurements of abscess fluids using a magnetic stress rheometer. *Physics of Fluids* (in review).
- Cai, P. C., Braunreuther, M., **Shih, A.**, Spakowitz, A. J., Fuller, G. G., Heilshorn, S. C., [Air-liquid intestinal cell culture allows in situ rheological characterization of intestinal mucus](#). *APL Bioengineering* (2024).
- DeSimone, J. M., Jacobson, G. B., Dulay, M. T., Lee, B. J., Hsiao, K., Rajesh, N., Driskill, M. M., **Shih, A.**, et. al., *Polymeric microstructures and systems and methods for making same*. Patent number WO2023049267A1.
- Hsiao, K., Lee, B. J., Samuelsen, T., Lipkowitz, G., Kronenfeld, J. M., Ilyn, D., **Shih, A.**, et al., [Single-digit-micrometer-resolution continuous liquid interface production](#). *Science Advances* (2022).
- Browne, C. A., **Shih, A.**, Datta, S. S., [Bistability in the Unstable Flow of Polymer Solutions in Porous Media](#). *Journal of Fluid Mechanics* (2020).
- Browne, C. A., **Shih, A.**, Datta, S. S., [Pore-Scale Flow Characterization of Polymer Solutions in Microfluidic Porous Media](#). *Small* (2019).

SKILLS

Technical/Laboratory: CAD; 3D printing; laser cutting; hardware/embedded systems (PCB assembly, Raspberry Pi); SEM; PCR; tissue/cell culture; immunostaining; confocal microscopy imaging
Software: programming in JAVA, MATLAB, Python; ImageJ; TRIOS; PIV; Adobe Illustrator/Photoshop