

# Sara Kapasi

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## Education

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### Georgia Institute of Technology

Major in biomedical engineering, minor in chemistry and biochemistry

Atlanta, Georgia

August 2022-Present

- GPA: 3.72/4.0, Major GPA: 3.70/4.0
- Activities: Women in Engineering, Women of Aeronautics and Astronautics, Southeast Analog, Undergraduate Research Ambassadors, Honors Program, DramaTech, BMES

## Experience

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### Undergraduate Researcher

Kostas Lab at Georgia Institute of Technology

Jan. 2023 - Present

Atlanta, GA

- Assessing gut microbial changes in farmworkers with heat-related illness through metagenomic and 16S rRNA sequencing in partnership with Emory University's School of Nursing
- Led a global team that conducted statistical analysis and genomic assignment for crayfish metagenomes to see how composition of intestinal microbiomes affect survival in lakes impacted by climate change
- Compared dada2 and lab-developed 16S amplicon sequencing analysis pipelines to analyze the difference in the severity of diarrheal diseases through gut microbiome composition of remote and urban populations in Ecuador
- Used metagenomic and immune marker data to investigate how intrinsic and acquired antigen response influences murine intestinal microbiome composition

### Product Engineering Intern

Varda Space Industries, Brooke Owens Fellowship

May 2025 – Aug. 2025

El Segundo, CA

- Performed high-throughput crystallization (80+ experiments) of ritonavir to investigate polymorph conversion rates over a range of process controls through XRPD and HPLC
- Identified and documented key manufacturing process controls for future use in Varda's GMP protocols
- Developed and executed a protocol to synthesize out-sourced polymorphs in-house

### MIT Summer Research Program (MSRP) Intern

Traverso Lab at Massachusetts Institute of Technology

Jun. 2024 – Nov. 2024

Cambridge, MA

- Stabilized anaerobic bacteria for long-term delivery of live biotherapeutics by optimizing excipient formulations for extreme manufacturing conditions for neonatal gut and vaginal health applications
- Jointly maintained the lab chemical library with >700 compounds for streamlined excipient testing
- Prepped agar plates and cultured batches of *B. infantis* and *L. crispatus* for use in stability testing (counting colonies on plates exposed to different environments)

### Summer Undergraduate Research Fellow

Appel Lab at Stanford University

Jun. 2023 – Aug. 2023

Stanford, CA

- Chemically synthesized and characterized the rheology of controlled-release polymer-nanoparticle hydrogels containing GLP-1 receptor agonists such as tirzepatide and semaglutide
- Characterized the pharmacokinetics of drug-containing hydrogels by in-vitro release assays and ELISAs
- Handled 40+ rats for in-vivo testing of the hydrogels, monitoring weight and glucose levels

### Undergraduate Researcher

Yeo Lab at Georgia Institute of Technology

Aug. 2022 – Dec. 2023

Atlanta, GA

- Fabricated flexible PCBs, soft wearable electronics, and soft biosensors for cardiovascular monitoring and early arrhythmia detection
- Created figures and gathered >50 papers for a wearable neonatal health technologies literature review

## Publications

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[1] Kapasi S, Meziti A, Brink C, Lucas M, Hatt J. K, Konstantinidis K. T, & Kormas K. The microbiome of *Procambarus clarkii* (crayfish) farmed under different growth conditions. *In prep.*

[2] **Kapasi S**, Yang L. H, Peña-Gonzalez A, Hatt J. K, Soto-Girón M. J, Smith S, Lee G, Trueba G, Cevallos W, Eisenberg J. N. S, Konstantinidis K. T, & Levy K. A paired case-control study to assess the response of the human gut microbiome to diarrhea across a remoteness gradient in Northern Coastal Ecuador. *In prep*.

[3] Biggs K.A., Bozorgzadeh S, Murphy M, Aronson N.C., Hughes C, Raehse B, Whinney E, Verma S, McNally G, Snapper O, Heavey M, Tucker I.J., Levine C, Girand O, **Kapasi SM**, Kang Z, Muller B, Barron SM, Gaspie K, Hayward A, Karavasili C, & Traverso G. Iterative evolution of an extremophilic formulation: stabilizing *Lactobacillus crispatus* to support global vaginal health. *In submission*.

[4] Dong, C., d'Aquino, A. I., Sen, S., Alakesh, A., Jons, C. K., Eckman, N., Williams, C. M., Nguyen, L. T., Yan, J., Saouaf, O. M., Song, Y. E., Hall, I., Lu, K., Manna, M. K., Kottamasu, S. A., Wilhelm, T., **Kapasi, S.**, Doulames, V., Klich, J., Reineking, W., & Appel, E. A. Structure–property–performance engineering of hydrogel depots for long-acting peptide delivery. *In submission*.

[5] d'Aquino, A. I., Dong, C., Nguyen, L. T., Yan, J., Jons, C. K., Saouaf, O. M., Song, Y. E., Eckman, N., **Kapasi, S.**, Williams, C. M., Doulames, V., Sen, S., Manna, M. K., Alakesh, A., Lu, K., Hall, I., & Appel, E. A. Long-acting hydrogel-based depot formulations of tirzepatide and semaglutide for the management of type 2 diabetes and weight. *Advanced Therapeutics* 2026;9:2. <https://doi.org/10.1002/adtp.202500329>

[6] Guess M, Soltis I, Rigo B, Zavanelli N, **Kapasi S**, Kim H, & Yeo WH. Wireless batteryless soft sensors for ambulatory cardiovascular health monitoring. *Soft Sci* 2023;3:23. <https://dx.doi.org/10.20517/ss.2023.17>

## Presentations

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### **The microbiome of the crayfish, *Procambarus clarkii* farmed under different growth conditions.**

- 2025 Out for Undergrad Life Sciences Conference, Minneapolis, Minnesota (Sept. 19, 2025).
- Annual Biomedical Research Conference for Minoritized Scientists 2025, San Antonio, Texas (Nov. 20, 2025).

### **Long-term stabilization of live biotherapeutics for neonatal and female health.**

- Annual Biomedical Research Conference for Minoritized Scientists 2024, Pittsburgh, Pennsylvania (Nov. 15, 2024).
- 2024 MSRP Research Symposium, Cambridge, Massachusetts (Aug. 1, 2024).

### **Formulation of GLP-1 polymer-nanoparticle (PNP) hydrogels for treatment of type 2 diabetes.**

- 2025 Out in Stem 15<sup>th</sup> Annual Conference, Baltimore, Maryland (Oct. 18, 2025).
- 2024 Out for Undergrad Life Sciences Conference, Minneapolis, Minnesota (Oct. 27, 2024).
- 2023 SURF Research Symposium, Stanford, California (Aug. 17, 2023).

**Wireless batteryless soft sensor for ambulatory cardiovascular health monitoring.** 2023 BMES Annual Meeting, Seattle, Washington (Oct. 14, 2023).

**Soft wireless cardiorespiratory patch for arrhythmia detection.** 2022 Georgia Tech VIP Innovation Competition, Atlanta, Georgia (Oct. 27, 2022).

## Honors and Awards

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### **oSTEM Actalent Engineering: Queer Excellence Scholarship** (Aug 2025)

- Awarded by oSTEM and Actalent for sustained service in the queer community

### **Women in Engineering (WiE) Scholarship** (2024, 2025)

### **Brooke Owens Fellow** (Jan 2025)

- Selected as a 2025 recipient of the Brooke Owens Fellowship, a competitive fellowship for women and gender minorities in the aerospace industry

### **DEEPenn STEM Scholar** (Oct 2024)

- Selected for a graduate preview weekend for minorities at the University of Pennsylvania

### **ABRCMS Travel Award** (2024, 2025)

### **Dave Clark Scholarship** (Apr 2024)

- Given by DramaTech Theatre to a member with exceptional technical service

### **Georgia Tech President's Undergraduate Research Award** (Fall 2023, Spring 2024)

### **1st Place Poster – Georgia Tech VIP Innovation Competition** (Apr 2023)

### **Faculty Honors & Dean's List** (2022 – Present)

## Mentoring

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- Mentored freshmen as part of **Georgia Tech's Women in Engineering** program
- Member of the **Brooke Owens Fellowship** Selection Committee
- Served as a **Georgia Tech Undergraduate Research Ambassador**, hosting office hours, panels, and symposia for undergraduates interested in research
- Served as a **DramaTech Theatre Peer Mentor**, mentoring students on balancing technical theatre with research involvements

## Activities and Organizations

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### **Head of Research, Southeast Analog** (Aug 2025 – Present)

- Run a team of 10+ members, integrating research proposals into a student-run Martian analog astronaut mission hosted at Biosphere2
- Prepare and present design reviews to MCC, Astronaut, and Systems Engineering teams
- Lead SOP development for experiment procedures and crew emergency management

### **Undergraduate Research Ambassador, Georgia Tech** (Aug 2024 – Present)

- Attend weekly meetings with other ambassadors planning and hosting monthly events promoting undergraduate research participation across Georgia Tech

### **Sound Designer & Production Manager, DramaTech Theatre** (Aug 2022 – Present)

- Lead and organize technical production of five shows within the DramaTech 2024-2025 season, coordinating technical deadlines and space usage amongst 100+ members of crew working with Atlanta theatre professionals
- Member of Technical Services Council responsible for upkeep of sound technology

### **BME Officer, Asclepius** (Oct 2024 – Aug 2025)

- Virtually organize and setup biomedical data collection for international scientific experiments involving analog astronauts in the Asclepius V lunar analog mission
- Prepare SOPs to manage medical emergencies in a simulated lunar base

### **Women's Committee Member, US Squash** (Nov 2022 – Present)

- Meet monthly with national women's squash leaders to expand accessibility of women's squash in Southeast US

### **Crisis Counselor, Crisis Text Line** (Aug 2022 – Dec 2023)

- Participated in over 30 hours of crisis intervention training, 240 hours of intervention for individuals reaching out on the Crisis Text Line platform
- Conducted risk assessments, utilized and executed psychological first aid

## Skills

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- Bioinformatics-specific: 16S amplicon sequencing, metagenomic sequencing, Kraken2, QIIME2, Bash, Linux, Python, R, MATLAB, HPC, BLAST, LfSe
- Engineering-specific: Fusion360, AutoCAD, COMSOL, Altium, PCB fabrication
- Other: Anaerobic culture, aseptic technique, agar plating, animal handling, chemical library development, spin coating, elastomer synthesis, hydrogel synthesis, ELISAs, in-vitro release assays, DNA extraction, PCR, XRPD, HPLC, DLS, microscopy, high-throughput crystallization, bioastronautics, extremophile development