

Ankita Roychoudhury
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Education

B.S. from Caltech

Major in Bioengineering, Minor in Control and Dynamical Systems

September 2017 – July 2021

Teaching

Teaching Assistant (TA) for **Introduction to Data Analysis in the Biological Sciences**. *Fall 2020*

Instructor: Dr. Justin Bois

TA for **Design Principles of Genetic Circuits**. *Spring 2021*

Instructors: Prof. Michael Elowitz and Dr. Justin Bois

2X TA for **Introduction to Programming in the Biological Sciences Bootcamp**. *Summer 2020, 2021*

Instructor: Dr. Justin Bois

2X TA for **Introduction to Synthetic Biology Modeling and Simulations Tools Bootcamp**. *Summer 2020 (Caltech), Fall 2020 (Build-A-Cell)*.

Instructors: Dr. Richard Murray, William Poole, Ayush Pandey, and Cindy Ren.

Caltech Dean's Tutor

Including classes such as morphogenesis, statistical inference, biomolecular engineering, biochemistry, quantum mechanics, chemistry lab, and more.

Publications

David R. Mittelstein, Jian Ye, Erika F. Schibber, **Ankita Roychoudhury**, Leyre Troyas Martinez, M. Houman Fekrazad, Michael Ortiz, Peter P. Lee, Mikhail G. Shapiro, and Morteza Gharib. "Selective ablation of cancer cells with low intensity pulsed ultrasound," *Applied Physics Letters*. Jan 2020.

William Poole, **Ankita Roychoudhury**, Richard Murray. Towards a Phenomenological Model of Extract Metabolism. *In prep (2021)*.

Ankita Roychoudhury. Understanding the Lifetime and Rate of Protein Production in Cell-Free Reactions While Maximizing Energy Use. Senior thesis (Minor), Caltech. doi:10.7907/94ms-B419.

Presentations

"Modeling a Glucose Pathway and an ATP Synthase Mechanism to show ATP Life Extension in Synthetic Cells," Caltech Summer Undergraduate Research Fellowship Poster Presentation. *August 2020*.

“Synergy of Targeted Low Intensity Ultrasound and Chemotherapy for Selective Cancer Therapy,” Caltech Summer Undergraduate Research Fellowship Presentation. *August 2018.*

“Using a telomere-specific nuclease to understand telomere end protection.” Laboratory Medicine Summer Research Program. *June 2016.*

Professional/Research Experience

Research Assistant for *Prof. Peng Yin, Harvard University*
Molecular Systems Lab, Wyss Institute
Jun 2021 – Present.

Undergraduate Researcher for *Prof. Richard Murray, Caltech*
Department of Bioengineering
Senior Thesis
Mar 2020 – Jun 2021.

- Experience with molecular biology techniques: PCR, gel electrophoresis (western blot and SDS page), DNA purification, cloning, transformations, NGS
- Collected and analyzed time-course inverted microscopy data. Learnt to make and encapsulate mixtures in vesicles.
- Used Software Packages (BioCRNpyler, Bioscrape, Sub-SBML) to Simulate Chemical Reaction Networks
- Designed and performed experiments independently

Undergraduate Researcher for *Profs. Mikhail Shapiro and Morteza Gharib, Caltech*
Departments of Chemical Engineering and Engineering & Applied Science
Performing experiments regarding the synergy of low intensity ultrasound and chemotherapy for selective cancer therapy.
Jan 2018 – Mar 2020.

- Studied the effect of low-intensity focused ultrasound and chemotherapy on cancer cells
- Learnt flow cytometry, mammalian cancer cell and T-cell culture, and ultrasound setup
- Recreated ultrasound setup at City of Hope for ongoing research

Project Engineering Intern at *Precision Combustion Inc.*

Advisor: Timothy LaBreche

Worked to create a reliable, accessible, and customizable data acquisition system with Raspberry Pi for consistent use and a wide variety of applications, including data collection from a portable generator used in the Army.

Jun 2019 – Sep 2019.

- Learnt electric wiring, software, and hardware for Arduino and Raspberry Pi based systems

High School Researcher for *Prof. Sandy Chang, Yale*

Using a Telomere-Specific Nuclease to Understand Telomere End Protection.

June 2016 – Aug 2016.

- Learnt basic biology wet lab skills, such as western blots, microscopy

Honors & Awards

- Caltech 2018 and 2020 **Summer Undergraduate Research Fellowships**
 - 2020 – Samuel P. and Frances Krown Fellow
- 2X **NCAA Scholar-Athlete**; 2018, 2020
 - Helped bring the team to its first ever top 20 NCAA DIII Ranking
- Southern California Intercollegiate Athletic Conference 2021 Women's Tennis Character Award
- Caltech Women's Tennis Most Improved 2018, 2020

Memberships

- 2-year Captain and 4-year member of the Caltech **Women's Varsity Tennis Team**.
- Member of the Caltech Bioengineering SFC. Communicate curriculum improvements to faculty.
- Member of the **Build-A-Cell Community**. Attend yearly conventions to discuss research progress.
- 2020-2021 Secretary and 4-year member of Fleming House at Caltech
- 3-year **Peer Advocate**: A student leader trained in listening skills and mental health issues in order to enhance residential experience of students at Caltech.
- Undergraduate Leader of Biotech Club. Worked to create a mentorship program for Caltech members to reach out to alumni and learn about life after college.
- UniRely Mentor: Helping students from around the world apply to Caltech
- Previously a member of the Society of Women Engineer's and MedLife Club
- Completed Caltech's Introduction to University Teaching Program

Community Service

- Volunteer for Reading Partners in Pasadena – Made weekly visits to a local middle school to teach underprivileged students how to read.
- Volunteered at *Daya Dan*, Mother Teresa home in India
- Volunteer Tutor for High School Students

Skills

Dry Lab

Proficient in Stan, Python, MATLAB, Mathematica, LabView, Systems Biology Markup Language
Experience with Java, SolidWorks, CAD, HTML

Wet Lab

Proficient in cell culture, flow cytometry, ultrasound setup, inverted microscopy, vesicle formation (and encapsulation), PCR

Experience with cloning, DNA sequencing/synthesis, TX-TL

Personal GitHub: <https://github.com/AnkitaRoychoudhury/>

- Includes Murray lab research in *ug_murray* repository

Updated Aug 2021.