

Rachel Y Sattler

(479)-268-1345 | rachel.y.sattler@gmail.com | Austin, Texas

EDUCATION

The University of Texas at Austin

Expected Graduation: Spring 2021

- Bachelor of Science in Biology, concentration in Microbiology and Infectious Diseases
- GPA 3.85
- Relevant Coursework: Bacterial Behavior & Signaling Mechanisms, Microbial Genetics, Molecular Virology of Animal Viruses, Bacteriology Lab, Immunology, and Immunology Lab.

AWARDS & ACCOLADES

Orville Wyss Endowed Scholarship, 2020

Awarded by the College of Natural Sciences at the University of Texas at Austin for academic excellence exhibited by students within the Department of Microbiology.

Benjamin A. Gilman International Scholarship, 2019

Awarded by the U.S. Department of State's Bureau of Educational and Cultural Affairs and the Institute of International Education. One of only twenty-two recipients chosen out of thirteen thousand applicants from Arkansas. Received recognition from U.S. Senator Tom Cotton of Arkansas and the governor of Arkansas, Asa Hutchinson. Noncompetitive Eligibility (NCE) certificate available upon request.

College Scholar - Honors

Awarded by the University of Texas at Austin to recognize exemplary academic record. Fall 2017, Spring 2018, Fall 2018, Fall 2019, and Spring 2019.

RESEARCH EXPERIENCE

Laboratory of Dr. Alan Lambowitz

The University of Texas at Austin

Undergraduate Research Assistant

Spring 2018 - Present

- The Lambowitz lab studies the function of thermostable group II intron reverse transcriptases (TGIRT) and utilizes their desirable properties for next generation sequencing to probe coding and non-coding RNAs found in cells.
- Completed training in Basic Radiological Health, Bloodborne Pathogens, and Laboratory Safety.
- Create lysogeny broth medium, various buffers, antibiotic stock solutions, and selective antibiotic plates. Complete routine lab checks for equipment and chemical inventories, radiation surveys, and maintenance of lab equipment and space.

Independent Research

Spring 2019-Present

- Assisted in constructing plasmids using Gibson cloning to determine if 5' untranslated regions of RNA's direct whether they are packaged into extracellular vesicles.
- Collaborate under the supervision of a postdoctoral researcher to characterize tRNA fragment expression and determine their functions in vitro.
- Developed a bioinformatic project analyzing short read archive data of argonaut-PAR-CLIP (Photoactivatable-Ribonucleoside-Enhanced Crosslinking and Immunoprecipitation) experiments, performed in HEK cells, in order to compare it to trends found in TGIRT-seq generated data from HEK cells.
- Cross-checked the data from tRFdb against multiple other publicly available tRNA fragment databases to determine RNA modification sites that could interrupt the fidelity of reverse transcriptases. Specifically focused on the m1A modification typically found at the 3' end of tRNA's.
- Data were mapped to a custom small non-coding RNA reference sequence in order to make comparisons of tRNA fragment types and abundance between these publicly available datasets and the data generated in the Lambowitz lab using TGIRT-seq and their mapping pipeline.
- Bioinformatic tools involved in the project include: Cutadapt, Hisat2, Samtools, and Rsamtools.
- Programming languages involved in the project include: R (tidyverse, Rmarkdown), bash, and python.

Laboratories of Drs. Nancy Moran and Howard Ochman

University of Texas at Austin

Evolutionary Biology Undergraduate Group

Fall 2020-Present

- Develop skills using computational biology and bioinformatics to navigate, analyze, visualize, and interpret data. Specific emphasis on studying the evolution of insect, bacterial, and viral genomes.
- Build upon basic skills scripting and programming in the Unix command line.
- Learn to navigate sequence databases, and download, assemble, and annotate (meta)genomic datasets.

- Conduct homology searches within genomic data for specific proteins, align those sequences, and build a phylogenetic tree to reflect evolutionary relationships between sequences.
- Use these skills to search the human genome for genetic components of endogenous retroviruses. Characterizing and determining the evolutionary relationships between these ERV's could potentially allow for one to assess the risk of a patient for ERV activation in response to epigenetic drug treatment or co-infection with another virus.

Summer Undergraduate Research Program (SURP): Cellular and Molecular Pathology Program

University of Pittsburgh

Undergraduate Researcher

Summer 2020, Cancelled due to COVID-19

- Accepted into the University of Pittsburgh's Summer Undergraduate Research Program (SURP) to conduct a research project in the Cellular and Molecular Pathology Program.
- Secured a position in the Chang and Moore virology lab to design a project to study SARS-CoV2 gene expression.

HIV-Research Lab at KEMRI/CDC

Center for Global Health and Research in Kisumu, Kenya

Intern

Summer 2019

- Studied the structure of the medical system in Kenya, including the role of newer point-of-care facilities in providing greater and faster access to medical care.
- Ran diagnostic tests using Taqman qPCR on dried blood spot samples to determine viral infection in infants
- Performed qPCR on adult plasma samples to determine viral load levels and interpret efficacy of antiviral drug treatment.
- Performed ELISA antibody tests on adult blood samples to diagnose HIV infection.
- Submitted clinical samples for FACS flow cytometry to determine progression of HIV infection by quantifying immune cell types.
- Prepared samples for Sanger sequencing and learned how to analyze and edit the sequencing reads on RECall. Blasted the sequences in the Stanford HIVdb drug resistance database to direct more individualized patient treatment.

SKILLS

Laboratory Techniques: Aseptic technique, bacterial culture, PCR, gel electrophoresis, DNA/RNA extraction, RNAseq, quantitative-PCR, gram staining, motility assays, quorum sensing assays, spectrophotometry, determination of phage titers, ELISA assays, western blotting, tissue culture, co-immunoprecipitation assays, immunodiffusion, construction of a plasmid vector, bacterial transformation and selection, Pulse Field Gel Electrophoresis and experience handling clinical samples.

Computer Skills: Data cleanup, visualization, and analysis in R. Experience performing statistical analysis and building regression models in R. Additional experience conducting RNA sequence alignments using python scripts, and performing metagenome assembly, annotation, alignment, and phylogenetic analysis in the Unix shell.

Scientific Communication Skills: Craft comprehensive reports to summarize research projects. Perform literature reviews over scientific publications, critically analyze, and present them. Present research projects and summarize conclusions during lab meeting. Materials created for these presentations and research project reports are available upon request.

SERVICE & LEADERSHIP

Brain Exercise Initiative

Co-Founder and Outreach Coordinator

Fall 2019 - Present

- A 501(c)(3) non profit organization focused on combating Alzheimer's Disease by sending college students to nursing homes to direct simple math, reading, and writing exercises to promote healthy brain and memory function.
- Recruit members and direct Volunteer Outreach Committee to recruit nursing homes and care facilities.

Alpha Epsilon Delta

Active Member

Fall 2018 - Present

- A national pre-health, pre-professional Honor Society.
- Participate in philanthropy projects to raise money for Dell Children's Surgical Outreach program and volunteer around the community at marathons, homeless shelters, food banks, and local organizations.
- Contribute to resources developed to share information on classes, research opportunities, professional development opportunities, and job openings.

She's the First

Media Committee Member

Fall 2019 - Present

- A student organization focused on hosting various fundraisers and events to raise money for women pursuing secondary education in developing countries.
- Assist in community outreach to raise awareness of our cause and promote engagement with fundraising events.