Ruwaida Raneem Rajna

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EDUCATION

Georgia State University (GSU), Atlanta, GA **August 2018 – December 2022**
Bachelor of Interdisciplinary Studies in Biomedical Science and Enterprise, GPA: 3.58
NIH-Maximizing Access to Research Careers (MARC) Fellow at GSU May 2021 – December 2022
Honors Thesis (Literature Review): *Zinc Homeostasis in Streptococcus pyogenes* and *Streptococcus pneumoniae*

Current Role: OITE-Post Baccalaureate Trainee at the National Institutes of Health July 2023 - Present

RELEVANT COURSES

Biomedical Science Related Coursework: Principles of Chemistry I & Lab; Principles of Chemistry II & Lab; Principles of Biology I & Lab; Principles of Biology II & Lab; Molecular Cell Biology; Organic Chemistry I; Intermediate Organic Chemistry Lab I & II; Careers in Biomedical Science; Scientific Communications; Experimental Approaches to Biomedical Science; Biomedical Ethics; Translational Immunology; Honors Thesis I and II

Computer Science Coursework: Principles of Computer Science I & II**;** Data Structures**;** System-Level Programming

RESEARCH EXPERIENCES

National Cancer Institute, The National Institutes of Health (NIH), Bethesda (main campus), MD
Office of Intramural Training and Education *Post Baccalaureate Program (OITE-PEP) Trainee, July 2023 - Present*
Principle Investigator: Zheng-Gang Liu
Inducing pyroptotic cell death in macrophages for investigating the cleavage of macrophage receptors to understand pyroptotic-induced inflammatory pathways in cancer development

- Growing J774A.1 macrophage cell line in DMEM media
- Inducing pyroptosis on J774A.1 cell line with LPS paired with ATP and Nigericin treatments respectively
- Collecting condition media and cell lysate protein concentrates from pyroptosis-induced cells at varied timepoints
- Running Western Blots to identify cleavage of target receptors

Department of Biology, Georgia State University, Atlanta, GA
MARC Research Fellow, August 2022- December 2022
Principal Investigator: Dr. Zehava Eichenbaum
Prepared literature review-based honors thesis: Zinc Homeostasis in *Streptococcus pyogenes* and *Streptococcus pneumoniae*

Department of Microbiology, Division of Medical Sciences, Harvard Medical School (HMS); Program in Cellular and Molecular Medicine, Boston Children's Hospital, Boston, MA
Summer Honors Undergraduate Research Program (SHURP) Intern, June 2022 - August 2022
Principal Investigator: Dr. Jeffrey Moffitt
Equipping Multiplexed Error Robust Florescence *in situ* Hybridization (MERFISH), a sophisticated spatial transcriptomic technology with CRISPR-Cas9 gene deletions to track single guide RNA (sgRNA) sequences in murine Peyer's Patches. Focused on building unique reporter sequences (URS) downstream to each unique sgRNA to construct CRISPR-MERFISH tracking of deleted genes

- Worked on amplifying and cloning 30 unique sgRNAs in lentiviral plasmids using plasmid purification techniques and Golden Gate Assembly experiment. Successfully amplified 25 sgRNAs out of 30 sgRNAs
- Cultured *E. coli* cells in solid and liquid media. Conducted bacterial transformations of *E. coli* with desired sgRNA cloned lentiviral plasmids (amplicons) by inoculation. Confirmed desired amplification of amplicons using agarose gel electrophoresis and imaging. Analyzed sanger sequencing data to validate the increase in length of amplicons
- Amplified 30 URS and conducted agarose gel excision to extract them for the future pairing of URS with each corresponding sgRNA

Center for Translational Immunology, Institute of Biomedical Sciences, Georgia State University, Atlanta, GA
MARC Research Fellow, May 2021 – May 2022
Principal Investigator: Dr. Cynthia N. Cornelissen, Julie Stoudenmire
Analysis of Ferric Uptake Regulator (Fur)-dependent gene regulation of the gonococcal TdfJ, a TonB-dependent transport protein involved in zinc acquisition. Focused on the expression and purification of Fur to analyze the interaction between Fur and the *tdfJ* promoter

- Used bioinformatic tools like SnapGene and APE to create a virtual insertion of Fur in an overexpression plasmid of *Neisseria gonorrhoeae* (Ngo) known as pET-19b
- Cloned Fur in pET-19b vectors and verified insertion by analyzing sanger sequencing data
- Transformed the cloned plasmids into Top10 and later BL21 high protein expression *E.coli* cells
- Confirmed expression of plasmids in cells via SDS-PAGE, Western Blots and DNA sequencing
- Purified Fur by Nickel column purification and protein dialysis

POSTER PRESENTATIONS

- **Rajna, Ruwaida R**., Yang, Evan., Moffitt, Jeffrey.; Equipping pooled CRISPR screens with *in situ* tracking of individual sgRNA. Leadership Alliance National Symposium, Hartford, Connecticut, July 2022
- **Rajna, Ruwaida R**., Padmanabhan, Sandhya., Stoudenmire, Julie L., Cornelissen, Cynthia N.; Analysis of Fur-dependent gene regulation of the gonococcal TonB-dependent transport proteins involved in zinc acquisition. Going the Distance 2.0 End of Summer Poster Symposium; Brain and Behavior Program and Center for the Advancement of Students and Alumni at GSU, Atlanta, GA, August 2021

PRESENTATIONS

- "Equipping spatial transcriptomics with CRISPR" – Presented at Undergraduate STEM Research Society at GSU and end of summer research presentations at 2022 HMS-SHURP
- "What is Research?" – Participated as a guest at GSU's undergraduate research panel to answer questions posed by enthusiastic students interested in biomedical science

LEADERSHIP EXPERIENCE:

Bangladesh Student Association, Georgia State University, Spring 2019- Summer 2021
Position: Secretary

- Established collaborations and harbored relationships with other cultural and ethnic associations
- Organized and provided input in budgeting and allocating resources with the International Student Associations Council at GSU
- Provided on and off campus housing support to incoming Bangladeshi students
- Worked to showcase the unique Bengali culture by hosting entertaining cultural events

OTHER PROFESSIONAL MEMBERSHIPS

- Member, Undergraduate STEM Research Society at GSU, Fall 2021 – December 2022
- Member, Research Recruits at GSU, Fall 2019 – Spring 2021
- Member, Girls Who Code at GSU, Spring 2020 – Spring 2021

HONORS & ACHIEVEMENTS

- Honors and Research Laureate Distinction, Fall 2022
- HMS SHURP 2022 Certification
- Dean's List, Fall 2022
- Dean's List, Spring 2022
- President's List, Summer 2020
- Dean's List, Spring 2020
- Dean's List, Spring 2019
- Dean's List, Fall 2018
- Hope Scholarship, Fall 2018- December 2022