

# Sammy Mustafa

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## EDUCATION

**Northwestern University** | Evanston, IL

Honors Program in Medical Education (HPME)

Anticipated June 2023

Bachelor of Arts in **Biological Sciences**, Concentration in **Computational & Systems Biology** | Minors: **Data Science & Linguistics**

GPA: 3.91/4.00 | Dean's List

**Relevant Courses:** Organic Chemistry, Molecular & Cell Biology, Genetics & Evolution, Biochemistry, Bioinformatics, Biostatistics, Computer Programming, Data Science I-III (R), Data Visualization, RNA Sequencing, Functional Genomics, Text Processing

## RESEARCH EXPERIENCE

**Northwestern Medicine, Department of Preventive Medicine (Health and Biomedical Informatics)** | Chicago, IL

Research Assistant, Under Dr. Faraz Ahmad

January 2023 – Present

- Leverage mental health information from large datasets like the Multi-Ethnic Study of Atherosclerosis (MESA) using R
- Study the comorbidity of mental health disorders and cardiovascular disease using machine learning techniques

**Feinberg School of Medicine, Department of Medicine (Cardiology)** | Chicago, IL

Research Fellow, Vaughan Lab

March 2021 – Present

- Exploit the RNA-binding protein SERBP1 to combat PAI-1 induced fibrosis, senescence, aging, and Alzheimer's *in vitro*
- Attempt to mimic transgenerational epigenetic prion-mediated PAI-1 destabilization
- Model and visualize genomic, plasma, and genealogic data from Amish community with unique null mutation via R

**Polytechnic University of Catalonia, Department of Physics** | Barcelona, Spain

Research Assistant, Computational Biology and Complex Systems Lab

June 2022 – September 2022

- Designed mathematical and spatial resolution models of the cAMP-PDE signaling pathway in atrial myocytes via MATLAB
- Developed differential formulas to model the autonomic effects of atrial fibrillation risk variant rs13143308T
- Investigated the modulation of the PDE1-Adenosine A<sub>2A</sub> macromolecular cluster on sarcoplasmic/cytosolic calcium levels

**Yale University, School of Management** | Remote

Research Assistant, Behavioral Research Lab

March 2022 – July 2022

- Collaborated with an inter-institutional team of professors investigating the effectiveness of negotiation strategies
- Cleaned, explored, and analyzed housing negotiation data to identify the linguistic behaviors that produce optimal outcomes for buyers and sellers via Python; compared the source of reduced variance in verbal vs. non-verbal experiments

**Bergen County Academics, Cell Biology Research** | Hackensack, NJ

Research Fellow, Cell Biology Lab

September 2016 – June 2020

- Studied the PTEN pseudogene in regulating the PI3K/Akt pathway in glioblastomas via miRNA repression *in vitro*
- Utilized bacterial transformation, transfection, qRT-PCR, indirect ELISA, flow cytometry, autophagy detection assay, vascular-endothelial tube formation assay, and Transwell migration assay techniques

## KEY PROJECTS

- ONGOING: Probing the potential of first-degree relatives' panomic data with machine learning techniques for more personalized and effective treatment recommendations for mental health disorders like depression (Precision Psychiatry)
- Predictive and Machine Learning Regression Models for US County Cancer Mortality Rates
- Personalized Anxiety-Relief Song Recommendations via Spotify API
- *SERBP1: Exploiting RNA-Binding Protein-Mediated PAI-1 Inhibition*
- *PTENP1: A Pivotal Pseudogene in Glioblastomas*

## SKILLS

**Languages:** R | Python | Unix | MATLAB | HTML | SQL | JavaScript

**Technologies:** Machine Learning | Git | Data Visualization | EPA | Microsoft Office

**Spoken Languages:** Spanish (Intermediate) | Arabic (Beginner)

## HONORS & AWARDS

HPME (2021) and Weinberg (2022) Summer Research Grants

Regeneron Science Talent Search Scholar

2<sup>nd</sup> Place – Biochemistry, BCA Research Exposition

Thermo Fisher Scientific Antibody Scholarship (\$5,000)

## WORK EXPERIENCE

**Northwestern University Residential Services** | Evanston, IL

Resident Assistant

August 2021 – Present

- Oversee 44 residents, serve overnight duty shifts, work the front desk, and develop community builder events
- Represent the RAs on the RA Advisory Board, advocate for adjustments to the position and services