Mudit Agarwal

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EDUCATION

University of Washington **Seattle, WA**

BS, Biochemistry/Neuroscience *Anticipated Graduation Date: June 2027*

Cumulative GPA: 4.00/4.00 | Relevant Coursework: Biology, Physics, Gen/Org/Phys/Bio Chemistry, Neuroscience

SKILLS

Programming Languages: Java, Python, C++, MATLAB, HTML, CSS, Javascript
Computational Tools: Chai, Boltz, AlphaFold, ProteinMPNN, Rosetta, Suite2p, PyMOL, AutodockVina, Solidworks
Laboratory Techniques: Two-photon calcium imaging (2PCI), CRISPR-Cas9 gene editing, DNA library construction, cell culture, ELISA, biological assays, PCR amplification, gel electrophoresis, sterile surgical assistance
Certifications: Registered Medical Assistant (MA-R), Basic Life Support (BLS)

EXPERIENCE

Bair Lab (University of Washington) | *Research Intern* **December 2024 – Present**

- Investigated cross-orientation suppression in macaque primary visual cortex using **two-photon calcium imaging** to study neural circuitry and coding (publication in progress)
- Developed novel analytical methods to quantify cross-orientation interactions, revealing distinct response patterns between superficial and deep cortical layers spanning thousands of ROIs across ~400 μm of cortical depth
- Performed stereotactic surgery on macaque for chronic two-photon imaging, including cranial drilling, dural opening, and titanium mesh chamber implantation with sub-millimeter precision

Meiler Lab (Vanderbilt University) | *Research Intern* **May 2025 – Present**

- Built computational pipeline integrating **AlphaFold**, **ProteinMPNN**, and **Rosetta** for alphavirus protein stabilization under $46M ARPA-H alphavirus vaccine development grant (publication in progress)
- Constructed protein generation pipeline incorporating structural relaxation and benchmarking across prediction tools (**AlphaFold, Chai, Boltz, Rosetta**) to optimize conformational stability (publication in progress)

Hawn Lab (University of Washington) | *Research Intern* **January 2025 – November 2025**

- Analyzed phospho-signaling events in human macrophages during M. tuberculosis infection using phosphoproteomics to identify pathways critical for infection control (publication in progress)
- Examined MAPKAPK2-regulated gene expression and cytokine responses during TB infection in macrophages
- Performed functional assays using **CRISPR-Cas9 gene editing**, **ELISAs**, **RT-qPCR amplification**, and **THP-1 macrophage cell culture models**

Evergreen Hospital (Sleep/Cardiology) | *Registered Medical Assistant* **July 2023 – Present**

- Managed clinical workflows for sleep/cardiology consultations, honing observational skills during diagnostic procedures and adhering to rigorous clinical protocols.

Anderson Lab (University of Washington) | *Research Intern* **September 2024 – December 2024**

- Integrated computational drug discovery pipeline with ADMET profiling to identify two lead anti-tuberculosis compounds targeting multidrug-resistant strains

Stiber Lab (University of Washington) | *Research Intern* **December 2023 – June 2024**

- Engineered computational models in **C++** and **Python** to analyze neuronal network dynamics in emergency services applications (**Github**)

PUBLICATIONS AND PRESENTATIONS

Spatial Variation in Response to Cross-Orientation Stimuli in Macaque Primary Visual Cortex **November 2025**

Poster presentation (Society for Neuroscience) | San Diego, CA

In Silico Design of Prefusion-Stabilizing Mutations in Alphavirus Envelope Glycoproteins **August 2025**

Oral Presentation (Vanderbilt VICB Symposium) | Nashville, TN | **YouTube**

Examining Alternatives to Rifampin in MDR-Tuberculosis **December 2024**

Oral Presentation (UW Research Symposium) | Seattle, WA | **YouTube**