

Alexander Mercer

Undergraduate Research Assistant

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Education

Nexa University

Seattle, WA

Bachelor of Science in Biochemistry & Molecular Biology (Minor in Quantitative Science)

Expected June 2028

Cumulative GPA: **3.94 / 4.00**

- **Relevant Coursework:** Organic Chemistry I & II, Genetics, Cell Biology, Quantitative Chemical Analysis, Linear Algebra, Introduction to R Programming.
- **Academic Honors:** Dean's List (All Quarters 2024 – 2026), Synapse Foundation Undergraduate Research Scholarship.

Research Experience

Synapse Molecular Biology Lab (Nexa University)

Seattle, WA

Undergraduate Research Assistant (Advisor: Dr. David Vance)

Oct 2025 – Present

- Engineered CRISPR-Cas9 plasmids to knock out regulatory enhancers in mammalian cells, achieving a 78% transfection efficiency.
- Performed genomic DNA extraction, PCR amplification, and agarose gel electrophoresis for 120+ mouse tissue samples.
- Developed a standardized qPCR protocol that reduced baseline assay variance by 15% across three lab projects.
- Maintained sterile cell culture environments for HEK293 and HeLa cell lines, executing daily media changes and cell counting.
- Curated and cataloged a digital repository of 300+ plasmids and primers using Benchling electronic lab notebook.

Apex Genomics Center

Seattle, WA

Laboratory Assistant Intern (Supervisor: Dr. Elena Rostova)

Jun 2025 – Aug 2025

- Prepared RNA-Seq libraries from plant tissue samples under strict quality control standards for sequencing-ready validation.
- Operated automated liquid handling systems and high-throughput microcentrifuges for high-density sample preparation.
- Conducted differential expression analysis in R, producing PCA plots and heatmaps for monthly lab progress reports.
- Managed general lab operations including preparing buffer solutions, autoclaving glassware, and restocking chemical inventory.

Technical & Laboratory Skills

Molecular Biology:	DNA/RNA extraction, PCR/qPCR, CRISPR/Cas9 editing, bacterial transformation, agarose gel electrophoresis, cell transfection.
Analytical Instruments:	UV-Vis spectrophotometry, high-performance liquid chromatography (HPLC), mass spectrometry, benchtop centrifugation.
Data & Computation:	R (ggplot2, tidyverse), Python (Pandas, NumPy), PyMOL molecular visualization, Benchling ELN, $\text{\LaTeX}$, git.
Lab Safety & SOPs:	Biosafety Level 2 (BSL-2) protocols, chemical waste management, MSDS compliance, aseptic techniques.

Projects & Leadership

Nexa University Chemistry Society

Seattle, WA

Laboratory Safety Officer

Sep 2025 – Present

- Led weekly peer tutoring sessions for general and organic chemistry courses, assisting 30+ students per quarter.
- Conducted monthly chemical safety audits of student-led experiment spaces in compliance with OSHA standards.

Biophysics Quantitative Modeling Project

Nexa University

Co-Developer (Course Capstone)

Jan 2026 – Mar 2026

- Wrote custom Python scripts to simulate protein-ligand binding kinetics using structural data from the Protein Data Bank (PDB).
- Designed dynamic 3D structural renders using PyMOL to present binding pocket interactions to a department jury.