Grace Finch

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RESEARCH INTERESTS

Forensic chemistry and biochemistry, protein-DNA interactions, biophysical characterization of protein-ligand interactions, SPR-based binding studies

EDUCATION

George Mason University, Science and Technology Campus — **Manassas, VA**
Master of Science — Expected December 2025
Chemistry with a Focus in Biochemistry
Cumulative GPA 3.95; Awarded Presidential Scholarship

Virginia Tech — **Blacksburg, VA**
Bachelor of Science — August 2021 - May 2024
Biochemistry
Cumulative GPA 3.83; Dean's List 2021-2024

WORK EXPERIENCE

Graduate Researcher — **Manassas, VA**
George Mason University — August 2024 - Present

- Expressed and purified de novo-designed proteins for biophysical and functional characterization using recombinant expression systems, employing techniques such as Ni-NTA affinity chromatography and buffer exchange
- Performed kinetic binding studies using Surface Plasmon Resonance (SPR) to evaluate protein-ligand interactions
- Led SPR troubleshooting efforts, refined experimental conditions and regeneration steps to improve reproducibility and data quality, established a workflow now used by the lab
- Analyzed SPR data using TraceDrawer to extract kinetic and equilibrium parameters (e.g. K_D, K_{on}, K_{off})
- Delivered weekly research updates in lab meetings and presented findings at departmental seminars
- Maintained detailed experimental records and troubleshot protein expression and purification protocols to improve yield and quality
- Trained 2+ lab members on SPR instrumentation and data analysis, enabling independent operation and consistency across experiments

Research Intern – Materials Measurement Laboratory — **Gaithersburg, MD**
National Institute of Standards and Technology — Summers 2022, 2023

- Conducted independent and team-based research and analysis on forensic samples for Standard Reference Material (SRM) development
- Analyzed Neutron Activation Analysis (NAA) data using statistical methods to determine the atomic composition of forensic glass samples
- Developed and optimized protocols for Next Generation Sequencing (NGS) for forensic DNA samples
- Evaluated sequencing data from the Illumina MiSeq system; identified suboptimal results and redesigned PCR primers to improve outcomes
- Processed forensic DNA using capillary electrophoresis (CE) and conducted bio-processing for SRM DNA kits
- Presented findings in final presentations and formal reports; collaborated closely with researchers, graduate students, and statisticians; participated in weekly meetings to update team on progress
- Utilized Excel to interpret experimental data and troubleshoot workflows for improved reproducibility

LEADERSHIP AND SERVICE

Team Lead – Alternative Spring Break Program — **Emmitsburg, MD and Lousiville, KY**
Catholic Campus Ministry at Virginia Tech — March 2023 and 2024

- Led and coordinated a group of ~20 student volunteers on spring break service trips focused on hands-on service work including construction, home repair, and community maintenance projects to support underserviced communities

- Acted as primary liaison between the group and partnering charities to plan logistics and ensure project readiness
- Oversaw daily schedules, delegated tasks, and ensured safety and productivity at work site while fostering a collaborative team environment
- Completed hands-on service work, including home repair

Team Lead – The Big Event Volunteer Day **Blacksburg, VA**
Virginia Tech April 2024

- Led a group of ~100 student volunteers representing Virginia Tech's Catholic Campus Ministry in Virginia Tech's largest community service initiative – The Big Event
- Coordinated with university event organizers to register participants, assign service sites, and ensure compliance with event guidelines
- Organized transportation logistics, communicated schedules and responsibilities to all volunteers, and ensured smooth day-of operations across multiple locations

Coordinator for the VT Hunt **Blacksburg, VA**
May 2022 – January 2024

- Organized a semesterly, large-scale, charity puzzle hunt with participation from hundreds of students
- Collaborated with a team of students and alumni to design 30-40 original puzzles per event, balancing challenge, accessibility, and creativity
- Managed event logistics, including scheduling, puzzle placement, and communication with university campus and local business partners
- Promoted the event through digital media, flyers, and on-campus outreach

SKILLS AND TECHNIQUES

Laboratory Techniques: Surface Plasmon Resonance (SPR), Protein Expression, Biophysical Characterization of De Novo Proteins, Polymerase Chain Reaction (PCR), Capillary Electrophoresis, DNA Sequencing (Next Generation Sequencing), SRM Sample Preparation, Circular Dichroism (CD)
Instrumentation and Systems: Reichert 2SPR, Illumina MiSeq, Promega Spectrum CE System (8-capillary), RapidHIT ID System
Software and Data Analytics: Microsoft Office Suite (Excel, Word), Mathematica, Geneious Prime, Lasergene 17, SegBuilder Pro 17
Interpersonal and Professional: Collaborative Research and Mentorship, Technical Communication, Scientific Writing, Problem-Solving

AWARDS

Dean's List Virginia Tech, 2021 - 2024

- Awarded for maintaining a GPA above 3.4 while enrolled full time

Norrine Bailey Strong Start Award Virginia Tech, 2021

- Awarded to Honors students who achieve a 4.0 GPA in their first semester

Presidential Scholarship Award George Mason University, 2024 - Present

- Competitive merit-based award granted to top incoming graduate students for academic excellence and research potential
- Covers tuition and pays a yearly stipend of $36,000 renewable up to four years