Julia M. Montgomery

NSF Graduate Fellow & Computational Chemist

Blacksburg, VA | For website; phone number provided upon request

jmaemontgomery [at] gmail.com | linkedin.com/in/jmaemontgomery | github.com/jmaemontgomery

EDUCATION

Virginia Tech in Blacksburg, Virginia — Est. May 2024
Ph.D. Candidate in Biochemistry

St. Joseph's University in Patchogue, New York — May 2019
Bachelor of Science in Chemistry (thesis-based); Biochemistry Sequence, Biology Minor

WORK EXPERIENCE

Graduate Research Fellow, **National Science Foundation** — 2021 – Present
• Created documentation and tutorial work for molecular dynamics simulations, GitHub, text-editors, and Unix used to train 18 undergraduate and graduate students
• Secured HPC resources equaling over $10,000 in equivalent value through NSF programs
• Mentored one visiting graduate student, two rotation students, and one undergraduate student directly
• Presented research at 4 national conferences, 3 industry meetings, and 5 university-level events

Graduate Research Assistant, **Virginia Tech** — 2019 – Present
• Established computational protocols for polarizable molecular dynamic simulations of membranes and membrane proteins for both production and analysis
• Simulated peptides (amyloid beta, WALP model peptide), proteins (NaV Sodium Channel, GPCRs), and biological membranes using OpenMM with a polarizable force field
• Parameterized a GPCR small molecule agonist, epinephrine, for a polarizable force field
• Four years of experience in applying high-performance, GPU-accelerated, and parallelized computing

Graduate Teaching Assistant, **Virginia Tech, Department of Biochemistry** — 2020 – 2023
• Assisted in teaching one graduate and two undergraduate courses ranging from 40 to 130 students
• Provided feedback on assignments and projects, generated review sessions, and held weekly office hours
• Developed and presented a lecture centered around hidden curriculum in computational sciences

Head Laboratory Assistant, **St. Joseph's University, Department of Physical Science** — 2017 – 2019
• Maintained laboratory equipment, including glassware, rotary evaporators, benchtop NMR Spectrometer, IR spectrometer, and varied probes, assisting students when necessary
• Handled, organized, and kept inventory of the department's stock of chemicals, reordering when needed, and making solutions for specific undergraduate lab and senior thesis needs

Tutor, **St. Joseph's University, Office for Tutoring and Academic Development** — 2017 – 2019
• Taught both voluntary and probationary students in specific course content and soft skill development
• Created small group content-focused sessions to increase tutoring opportunities within a part-time schedule

SELECTED HONORS & AWARDS

• Catalyzing Gender Equity at Schrödinger Symposium selected participant
• Bayer CS University Mentoring Program selected participant
• National Science Foundation GRFP awardee
• 4 travel grants equaling $2,500 in support
• Virginia Tech Department of Biochemistry Dean's Scholar awardee
• Rosemary O'Halloran Women in Chemistry Scholarship awardee

PUBLICATIONS

Davidson, D. S., Kraus, J. A., **Montgomery, J. M.** Lemkul, J. A. 2022. *Effects of Familial Alzheimer's Disease Mutations on the Folding Free Energy and Dipole–Dipole Interactions of the Amyloid β-Peptide*. J. Phys. Chem. B 2022, 126, 39, 7552–7566

LEADERSHIP & SERVICE

Virginia Tech Biochemistry Graduate Student Association (BcGSA) 2019 – Present

Pilot Mentorship Program Chair 2023 - Current | Communications 2022-2023 | Event Coordinator 2019-2020

• Developed a peer mentoring program to assist first-year student's transition to graduate school

• Served on a departmental committee as a graduate student representative to streamline website and social media messaging to encourage buy-in from graduate students, undergraduate students, and alumni

• Assembled welcome/informational packages for incoming graduate students during COVID-19 shutdowns

SJU Chemistry Club 2015 – 2019

President 2018 – 2019

• Established a STEM curriculum for a local preschool and aided in elementary school science fairs

• Acted as a community role-model through organizing biannual blood drives and seasonal river clean-ups

TECHNICAL SKILLS

• Physics-based simulation softwares (CHARMM, OpenMM, LOOS, MDAnalysis, NAMD, Psi4, PLUMED, GROMACS)

• Enhanced sampling techniques (Umbrella Sampling, Metadynamics)

• Visualization (PyMOL, VMD, Blender)

• Scripting languages (Python, Bash, LaTeX)

• Version control (Git, GitHub)

• Structure Prediction tools (MODELLER, AlphaFold, Phyre^2, SWISS-MODEL)

• Virtual environments/Containers (Conda, Docker)

• High-performance computing (SLURM)

• Linux/Unix

• Data visualization tools (Grace, Matplotlib, R)

• Large-scale data analysis

• Documentation of code and workflows