Julia M. Montgomery

National Science Foundation Graduate Research Fellow | juliamontgomery@vt.edu

EDUCATION

Virginia Tech in Blacksburg, Virginia — Present
Ph.D. Candidate in Biochemistry
Anticipated Graduation: May 2024

St. Joseph's University (formally St. Joseph's College) in Patchogue, New York — 2019
Bachelor of Science in Chemistry
Biochemistry Sequence, Biology Minor

HONORS AND ACCOMPLISHMENTS

National Science Foundation XSEDE Allocation awarded
2021 National Science Foundation Graduate Research Fellowship Program
Virginia Tech Department of Biochemistry Dean's Scholar Award
Rosemary O'Halloran Women in Chemistry Scholarship awarded
Brookhaven National Lab Mini-Semester Participant
SJC 9000 Scholastic Achievement Scholarship awarded
Gamma Sigma Epsilon Chemistry Honor Society Member
Dean's List awarded for Fall 2016, 2018, Spring 2017, 2018, 2019

RESEARCH EXPERIENCE

National Science Foundation Graduate Research Fellow (2021 – Present)

Molecular Dynamics Simulations of Membrane Interactions (2019 – Present)

- Project Focus: Characterizing the dynamics of small molecules and proteins interacting with membranes using the Drude polarizable force field
- Principal Investigator: Dr. Justin Lemkul - Department of Biochemistry, Virginia Tech

DNA Aptamer-Based Estrogen Sensor (2018 – 2019)

- Thesis: Using Gold Nanoparticles to Form a Colorimetric Assay for Wastewater Estrogen Detection
- Principal Investigator: Dr. Andrea Stadler - Department of Chemistry, St. Joseph's University

TECHNICAL SKILLS

- Molecular Dynamics Simulations
- CHARMM, OpenMM, LOOS, NAMD, MDAnalysis, PLUMED, Gaussian09, GROMACS
- Enhanced Sampling Techniques (Umbrella Sampling, Metadynamics)
- Visualization (PyMOL, VMD)
- Programming languages (Python, Bash, Fortran, Perl)
- High-performance computing (SLURM)
- Linux/Unix
- Documentation of code and computational workflows
- Version control (Git)
- Structure Prediction tools (MODELLER, AlphaFold)
- Data visualization tools (Grace, R, Matplotlib)
- Large-scale data analysis
- Process Automation

TEACHING EXPERIENCE

Graduate Teaching Assistant, Virginia Tech, BCHM 2024: Concepts of Biochemistry (Spring 2021)

- Held monthly self-organized review lectures prior to exams
- Prepared class notes for students with accommodations
- Assisted with grading assignments
- Advisor: Dr. Sasha Marine

Graduate Teaching Assistant, Virginia Tech, BCHM 2114: Biochemical Calculations (Spring 2020)

- Reviewed concepts and assignments during weekly office hours
- Aided to transfer the course online mid-semester due to COVID-19
- Assisted with grading assignments
- Advisor: Dr. Pablo Sobrado

Tutor, St. Joseph's University, Office for Tutoring and Academic Development (2017 – 2019)

- Taught both voluntary and probationary students who were struggling academically
- Specialized in General Chemistry, Organic Chemistry, Genetics, and scientific writing skills
- Provided accommodations for students including reading, writing, and clarifying exams

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.

PRESENTATIONS

Montgomery, J. M., Lemkul, J. A. (2022). *Polarization in Partitioning: Quantifying the Effects of Induced Dipoles on Amino Acid Sidechain Analogs in a POPC Membrane*. Platform talk presented at the Biophysical Society 66th Annual Meeting.
Montgomery, J. M., Lemkul, J. A. (2020). *Membrane Dynamics in the Drude Polarizable Force Field.* Poster presented at Virginia Tech Biochemistry's Annual Retreat.
D. S. Davidson, J. A. Kraus, **Montgomery, J. M.**, Lemkul, J. A. (2020). *Effect of Familial Alzheimer's Disease Mutations of the Folding Free Energy of Amyloid Beta-Peptide.* Poster presented at Biophysical Society National Meeting.
Montgomery, J. M., Stadler, A. (2019). *Gold Nanoparticle Colorimetric Detection of Estrogen and Estrogen Mimics.* Poster accepted at American Chemical Society Spring National Meeting.
Montgomery, J. M., Stadler, A. (2019). *Gold Nanoparticle-Based Colorimetric Sensor of Estrogen Using a Split Aptamer Assembly*. Poster presented at St. Joseph's Undergraduate Research Symposium.

WORK EXPERIENCE

Head Laboratory Assistant, St. Joseph's University Department of Physical Science (2017 – 2019)

- Set up and 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's needs
- Maintained proper storage for organic, inorganic, acid, base, and halogenated wastes, both solids and liquids
- Acted as a point-of-contact between professors and the department
- This role was replaced by a full-time non-student after my departure

LEADERSHIP EXPERIENCE

Biochemistry Graduate Student Association, (2019 – Present)
Communication Liaison 2022 – Present, Event Coordinator 2019 – 2020
Assembled welcome and informational packages for incoming graduate students during COVID-19.

SJC Chemistry Club, President from 2018 – 2019 (2015 – 2019)
Established a STEM curriculum for a local preschool and aided in elementary school science fairs.

OUTREACH & SERVICE

GRFP Mentor for Effective Grant Writing, Virginia Tech (2022)
Virginia Tech Biochemistry – Departmental Communications Committee Member (2022)
BcGSA Tailgate Organizer, Virginia Tech (2019, 2021, 2022)
Engelpalooza Volunteer, Virginia Tech (2019, 2022)

Hokie Host, Virginia Tech (2020)
Wading River Science Fair (2017 – 2019)
Relay for Life, St. Joseph's University (2016 -2019)
Patchogue Town River Clean-Ups (2015 – 2019)
Blood Drive Volunteer, St. Joseph's University (2015 – 2019)
SJC Make a Difference Day, St. Joseph's University (2015 – 2019)
Thanksgiving Pumpkin Pie Bake, St. Joseph's University (2015 – 2018)

ORGANIZATIONS

Virginia Tech Graduate and Professional Student Senate (2021 – Present)
Biophysical Society (2019 – Present)
American Chemical Society (2018 – Present)