

# Brian Andrews

## Education

- Ph.D. Candidate**, *Drexel University*, Philadelphia, PA. Fall 2018–Present  
Physics - Research in Biophysics & Molecular Simulation. Expected Grad:  
Early 2023.
- M.S.**, *Case Western Reserve University*, Cleveland, OH. Fall 2016–Summer 2018  
Physics - Entrepreneurship Track
- B.A.**, *Kenyon College*, Gambier, OH. Fall 2012–Spring 2016  
Physics - Math Minor - Scientific Computing Concentration

## Research

### Publications

6. **Brian Andrews**, Thomas Ruggiero, and Brigita Urbanc. How Do Salt and Lipids Affect Conformational Dynamics of A $\beta$ 42 Monomers in Water? *Phys. Chem. Chem. Phys.*, 2022. Submitted.
5. **Brian Andrews**, Jose Guerra, Reinhard Schweitzer-Stenner, and Brigita Urbanc. Do molecular dynamics force fields accurately model ramachandran distributions of amino acid residues in water? *Phys. Chem. Chem. Phys.*, **24**, 3259-3279, 2022.
4. **Brian Andrews**, Kaho Long, and Brigita Urbanc. Soluble state of villin headpiece protein as a tool in the assessment of MD force fields. *J. Phys. Chem. B*, **125(25)**, 6897–6911, Jul 2021.
3. B. Milorey, R. Schweitzer-Stenner, **B. Andrews**, H. Schwalbe, and B. Urbanc. Short peptides as predictors for the structure of polyarginine sequences in disordered proteins. *Biophys. J.*, **120**, 662–676, 2021.
2. S. Zhang, **B. Andrews**, R. Schweitzer-Stenner, and B. Urbanc. Intrinsic conformational dynamics of alanine in water/ethanol mixtures: An experiment-driven molecular dynamics study. *J. Phys. Chem. B*, **124(51)**, 11600–11616, 2020.
1. **B. Andrews**, S. Zhang, R. Schweitzer-Stenner, and B. Urbanc. Glycine in water favors the polyproline II state. *Biomolecules*, **10**, 1121, 2020.

### Contributed Talks at Conferences and Meetings

3. **B. Andrews**, S. Zhang, R. Schweitzer-Stenner, and B. Urbanc. Assessing the Ability of Molecular Dynamics Force Fields to Capture Conformational Dynamics of Amino Acid Residues in Water. APS March Meeting, 2022.
2. **B. Andrews**, S. Zhang, R. Schweitzer-Stenner, and B. Urbanc. Glycine Shows Preference for Polyproline II Indicating Greater Role for Amino Acid Backbone. APS March Meeting, 2021.
1. **B. Andrews**, K. Long, and B. Urbanc. Examining the Self Assembly of the Villin Headpiece Protein: A Combined Experimental and Molecular Dynamics Study. APS Mid-Atlantic Section Fall Meeting, 2020.

### Poster Presentations

2. **B. Andrews**, T. Ruggiero, and B. Urbanc. Analyzing the Conformational Differences of the Intrinsically Disordered Amyloid  $\beta$ -Protein in Varying Lipid and Salt Concentrations. Drexel URCF Showcase, 2022.

1. **B. Andrews**, S. Zhang, R. Schweitzer-Stenner, and B. Urbanc. Hydrogel-forming Ultrashort Oligopeptides in Water/Ethanol Mixtures as a Potential Candidate for Oral Drug Delivery. Merck Emerging Talent Symposium, 2021.

## Peer Review Contributions

Journal of Physical Chemistry Letters, Proteins, Biochemistry, Journal of Chemical Information and Modeling

## Awards

The Guoliang Yang Award, Drexel University, 2022.

## Experience

<b>Systems Administrator</b> , <i>Drexel University</i> , Philadelphia, PA. Responsible for upkeep of Physics department servers as well as lab computers.	Fall 2020–Present
<b>Teaching Assistant</b> , <i>Drexel University</i> , Philadelphia, PA. Moderate recitations and lab exercises for students with various levels of physics backgrounds.	Fall 2018–Spring 2022
<b>Adjunct Instructor</b> , <i>Salem County Community College</i> , Salem, NJ. Taught introductory physics where I designed my own lectures and laboratory experiments.	Summer 2019
<b>Operations Intern</b> , <i>OptoQuest Inc.</i> , Cleveland, OH. Created a machine learning model to predict postoperative risk profiles of patients undergoing eye surgeries.	Summer 2017–Summer 2018
<b>Data Science Associate</b> , <i>MedaSync Inc.</i> , Cleveland, OH. Constructed a self-updating machine learning cost prediction model in a production environment (AWS) which estimated medical costs based on diagnosis, projected length of stay, and comorbidities.	Fall 2017–Summer 2018

## Skills

**Primary Programming Languages:** Python, C, Bash, Mathematica, MATLAB, SQL  
**Software:** GROMACS, AMBER, VMD, OpenMM  
**Computing:** Highly Parallelized HPC at Drexel URCF, XSEDE at UT. Proficient with SLURM, TORQUE, Univa Grid Engine. Proficient with distributed Windows and Linux systems.  
**Development Experience:** Git, AWS (EC2, S3, Lambda, MongoDB), Google Data Studio

## Open Source Software Contributions

<b>OpenMM.</b> Add polarizable solvent directly to system. Pull request #3760: <a href="https://github.com/openmm/openmm/">https://github.com/openmm/openmm/</a> .	Summer 2022
<b>pdb-tools.</b> Pull Request #112: <a href="https://github.com/haddock/pdb-tools">https://github.com/haddock/pdb-tools</a> .	Winter 2021

## Extracurriculars

<b>Analytics Contributor and Writer</b> , <i>Pro Lacrosse Talk</i> , Remote. Contribute via analytics articles, modeling win probabilities using machine learning, and podcast appearances.	Summer 2020–Present
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