



Nathan Gallagher Brady

PhD Candidate, Graduate Teaching/Research Assistant
Department of Biochemistry & Cellular and Molecular Biology
The University of Tennessee Knoxville

Education

Graduate	The University of Tennessee Knoxville. Ph.D. candidate, late stage.
2015 - present	Dept: Biochemistry & Cellular and Molecular Biology, Advisor: Dr. Barry D. Bruce.
Undergraduate	The State University of New York College of Environmental Science and Forestry (SUNY-ESF), in association with Syracuse University.
2005 - 2009	Dept: Chemistry, Focus: Environmental/Analytical Chemistry, Advisor: Dr. Mark Teece.
Degree (2009)	Bachelor of Science, Chemistry.

Publications

12/2019	Nathan G. Brady , Shuo Qian, Hugh O'Neill and Barry D. Bruce. Investigating the dimensions of PSI-SMALP from <i>Thermosynechococcus elongatus</i> by small angle x-ray and neutron scattering. <i>Biochemical Journal. Manuscript In Progress.</i>
12/2019	Minh D. Phan, Olena I. Korotych, Nathan G. Brady et al. X-ray and neutron reflectivity studies of styrene maleic acid polymer interactions with galactolipid-rich monolayers. <i>Langmuir. In Secondary Review.</i>
12/2019	Dmitry A. Cherepanov, Nathan G. Brady , Ivan V. Shelaev, et al. PSI-SMALP, a detergent-free form of cyanobacterial photosystem I reveals faster femtosecond photochemistry. <i>The Biophysical Journal.</i> DOI: 10.1016/j.bpj.2019.11.3391
10/2019	Nathan G. Brady , Meng Li, James C. Gumbart, Barry D. Bruce. Non-detergent isolation of a cyanobacterial photosystem I using styrene maleic acid alternating copolymers. <i>RSC Advances.</i> DOI: 10.1039/c9ra04619d
7/2019	Roman A. Voloshin, Nathan G. Brady , Margarita V. Rodinova et al. Enhanced activity and stability of osmotically-stabilized thylakoids in a biohybrid solar cell. <i>International Journal of Energy Research.</i> DOI: 10.1002/er.4866
11/2018	Nathan G. Brady , Shuo Qian, Barry D. Bruce. Analysis of Styrene Maleic Acid Alternating Copolymer Supramolecular Assemblies in Solution by Small Angle X-ray Scattering. <i>European Polymer Journal.</i> DOI: 10.1016/j.eurpolymj.2018.11.034
6/2018	E. Musazade, R. Voloshin, N. Brady et al. Biohybrid solar cells: Fundamentals, progress, and challenges. <i>Journal of Photochemistry and Photobiology C: Photochemistry Reviews.</i> DOI: 10.1016/j.jphotochemrev.2018.04.001
3/2018	G.A. Venkatesan, G.J. Taylor, C.M. Basham, N.G. Brady , et al. Evaporation-induced monolayer compression improves droplet interface bilayer formation using unsaturated lipids. <i>Biomicrofluidics.</i> DOI: 10.1063/1.5016523
12/2016	R.A. Voloshin, V.S. Bedbenov, D.A. Gabrielyan, N.G. Brady , et al. Optimization and characterization of TiO ₂ -based solar cell design using diverse plant pigments. <i>International Journal of Hydrogen Energy.</i> DOI: 10.1016/j.ijhydene.2016.11.148

Honors and Awards

3/2020	University of Tennessee Knoxville Graduate School Spring 2020 Fellowship
12/2019	Tennessee Plant Research Center Travel Fellowship
12/2019	Western Photosynthesis Conference Travel Award
11/2019	Knoxville Scipreneur Challenge Pitch Competition 1st place Winner
4/2019	4th International SMALP Conference Outstanding Speaker Award
4/2019	2019 David and Becky Eaker Graduate Student Award
4/2019	University of Tennessee Graduate Student Senate Travel Award
3/2019	Neutron Beam Award at Spallation Neutron Source, Oak Ridge National Lab
1/2019	Western Photosynthesis Conference Travel Award
11/2018	Tennessee Plant Research Center Travel Fellowship
9/2018	Neutron Beam Award at Spallation Neutron Source, Oak Ridge National Lab
1/2018	Western Photosynthesis Conference Travel Award
11/2017	University of Hyderabad, India, Outstanding Achievement Award
11/2017	University of Tennessee Graduate Student Senate Travel Award
7/2017	Beam Award at National Synchrotron Light Source II, Brookhaven National Lab
7/2017	Neutron Beam Award at High Flux Isotope Reactor, Oak Ridge National Lab
1/2017	Neutron Beam Award at High Flux Isotope Reactor, Oak Ridge National Lab
6/2017	Penley Foundation Fellowship
6/2017	Neutron Scattering Applications in Structural Biology Awardee, Oak Ridge National Lab
3/2017	NSF Graduate Research Fellowship Program Honorable Mention
1/2017	Tennessee Plant Research Center Travel Fellowship
1/2017	Western Photosynthesis Conference Travel Award
1/2017	University of Tennessee Graduate Student Senate Travel Award
8/2016	International Congress on Photosynthesis Research Travel Award
1/2016	Western Photosynthesis Conference Travel Award
1/2016	University of Tennessee Graduate Student Senate Travel Award
8/2015	University of Tennessee Knoxville Chancellor's Fellowship

Oral Presentations

3/2020	<u>5th International SMALP Conference, New York, NY, USA.</u> Insights into the Formation and Future Applications of PSI-SMALP.
1/2020	<u>29th Western Photosynthesis Conference, Bodega Bay, CA, USA.</u> Insights into the Formation, Biophysical Characteristics, and Applications of PSI-SMALP.
11/2019	<u>Life Science Tennessee Convention (LSTcon 2019), Knoxville, TN, USA.</u> LEAPh (Light Energy Applied Photosynthetic) Systems: Harnessing the Power of Nature to Fuel our Industrial World.
11/2019	<u>Oak Ridge National Laboratory Neutrons in Biology Workshop, Knoxville, TN, USA.</u> Insights into Native Membrane Protein Isolation using Neutrons and SMALPs.
11/2019	<u>The Inaugural Knoxville Scipreneur Challenge Pitch Competition, Knoxville, TN, USA.</u> LEAPh (Light Energy Applied Photosynthetic) Systems: Harnessing the Power of Nature to Fuel our Industrial World.

- 9/2019 The "IP Parade", Scipreneur Challenge, Knoxville, TN, USA.
Integration of Photosystem I Nanodiscs into Biohybrid Solar Devices for the Sustainable Production of Electricity.
- 4/2019 4th International SMALP Conference, Utrecht, Netherlands.
Photosystem I Native Nanodiscs: Preserving the Powerplant of the Planet within Styrene Maleic Acid Lipid Particles (SMALPs).
- 1/2019 28th Western Photosynthesis Conference, Friday Harbor, WA, USA.
Investigating Dimensions, Constituents and Activity of PSI Complexes within Styrene Maleic Acid Lipid Particles (SMALPs).
- 7/2018 International Society for Photosynthesis Research, American Society of Plant Biologists 2018 Sessions, Montreal, QC, Canada.
Investigating the Effect of Native Membrane Retention on *in vitro* Activity of PSI Enveloped within Styrene Maleic Acid Lipid Particle.

Poster Presentations

- 2/2020 Tennessee Plant Research Center Women in Science Series, Knoxville, TN, USA
Nathan G. Brady, Meng Li, Barry D. Bruce
Investigating Dimensions, Constituents, and Activity of PSI Complexes Within Styrene Maleic Acid Lipid Particles (Updated).
- 6/2019 ORNL Neutron Scattering User Meeting, Oak Ridge, TN, USA.
O. Korotych, M. Phan, **N. Brady**, S. Satija, J. Ankner, B. D. Bruce
Neutron and X-ray Reflectivity Studies of Styrene-Maleic Acid Polymer Interactions with Thylakoid Lipid Monolayers.
- 1/2019 28th Western Photosynthesis Conference, Friday Harbor, WA, USA.
Nathan G. Brady, Olena Korotych, Meng Li, Barry D. Bruce
Investigating Dimensions, Constituents and Activity of PSI Complexes Within Styrene Maleic Acid Lipid Particles.
- 1/2018 27th Western Photosynthesis Conference, Oracle, AZ, USA.
Nathan Brady, Jonathan Nguyen, Alex Teodor, Yue Ma, Meng Li, Barry Bruce
Characterization of Trimeric PSI Within Styrene Maleic Acid Lipid Particle (Updated).
- 11/2017 8th International Conference "Photosynthesis and Hydrogen Energy Research for Sustainability – 2017," Hyderabad, India.
Nathan Brady, Jonathan Nguyen, Alex Teodor, Yue Ma, Meng Li, Barry Bruce
Characterization of Trimeric PSI Encapsulated Within Styrene Maleic Acid Lipid Particle
- 7/2017 Annual Meeting of the American Society of Plant Biologists, Honolulu, HI.
A. Teodor, **N. Brady**, J. Ossyra, K. Nguyen, X. Cheng, J. Smith, B. Bruce
Comparative Dynamics of Cyanobacterial Cytochrome C6 Electron Transfer to Photosystem I by *in silico* Biomolecular Brownian Dynamics Simulations and *in vitro* Laser Flash Photolysis
- 1/2017 26th Western Photosynthesis Conference, Marshall, CA, USA.
Nathan Brady, John Ossyra, Xiaolin Cheng, Barry D. Bruce, Jeremy Smith
Biomolecular Brownian Dynamics Simulation of the Docking of Cytochrome c₆ to the Lumenal Surface of PSI (Updated).

- 8/2017 17th International Congress on Photosynthesis Research, and Biohybrid Solar Cells Satellite meeting, Maastricht, Netherlands.
Nathan Brady, John Ossyra, Xiaolin Cheng, Barry D. Bruce, Jeremy Smith
Biomolecular Brownian Dynamics Simulation of the Docking of Cytochrome c_6 to the Lumenal Surface of PSI.
- 1/2016 25th Western Photosynthesis Conference, Tabernash, CO, USA.
Brady, NG, Holbrook, KN, Barrera FN, Bruce BD
In Vitro Analysis of Direct Interaction Between Chloroplast Peptides and Envelope Lipids Using Langmuir-Blodgett Troughs.

Academic Research Experience

- 8/2016 - Present **Graduate Research Assistant**, Department of Biochemistry & Cellular and Molecular Biology, University of Tennessee at Knoxville. Principle Investigator: Dr. Barry Bruce
Topics: Fabrication of biohybrid solar devices, electron transfer kinetics in photosynthesis, structural characterization of PSI reaction center, detergent free isolation methods of membrane protein complexes.
- 3/2016 - 4/2016 **Rotation Student**, Department of Biochemistry & Cellular and Molecular Biology, University of Tennessee at Knoxville. Principle Investigator: Dr. Jeremy Smith
Topic: Modeling the docking of cytochrome c_6 to the lumenal surface of photosystem 1 using Brownian Dynamics Simulation.
- 1/2016 - 3/2016 **Rotation Student**, Department of Biochemistry & Cellular and Molecular Biology, University of Tennessee at Knoxville. Principle Investigator: Dr. Barry Bruce
Topic: Measuring quantum efficiency of dye sensitized solar cells with various pigments and extraction methods.
- 10/2015 - 12/2015 **Rotation Student**, Dept: Biochemistry & Cellular and Molecular Biology, University of Tennessee, Knoxville, TN. Principle Investigator: Dr. Francisco Barrera
Topic: Interaction between RUBISCO small subunit transit peptide with *in vitro* chloroplast outer membrane mimetic.
- 5/2011 - 10/2012 **Industrial Researcher**, Dept: Aquatic Fisheries Biology, Colorado State University, Fort Collins, CO. Principle Investigator: Dr. Jesse Lepak
Topic: Developed sampling protocol, analyzed mercury in sediment, water column and benthic invertebrates of freshwater reservoirs.
- 9/2008 - 5/2009 **Undergraduate Researcher**, Chemistry Department, SUNY-ESF, Syracuse, NY.
Principle Investigator: Dr. David Johnson
Topic: Designed and implemented experiments to research nitrogen requirement for anaerobic digestion systems.
- 1/2008 - 5/2008 **Undergraduate Researcher**, Chemistry Department, SUNY-ESF, Syracuse, NY.
Principle Investigator: Dr. Mark Teece
Topic: Analyzed fatty acids of marine macroalgae in coral reef systems by GC.

Academic Leadership

- 11/2019 Graduate Student Representative, Round Table Discussion with Chancellor Plowman
- 6/2019 - Present President, BCMB Graduate Student Organization
- 3/2019 - 6/2019 Graduate Student Representative, BCMB Departmental Recruitment Committee
- 6/2017 - 6/2019 Treasurer, BCMB Graduate Student Organization

Professional Societies

- 9/2016 - Present Member, American Association for the Advancement of Science
 3/2016 - Present Member, The International Society of Photosynthesis Research
 1/2016 - Present Member, The Tennessee Plant Research Center
-

Teaching Experience

- 1/2016 - Present **Graduate Teaching Assistant** for BCMB 419, University of Tennessee Knoxville.
Cellular and Comparative Biochemistry Laboratory
- 8/2016 - 12/2016 **Graduate Teaching Assistant** for BIO 101, University of Tennessee Knoxville.
Introduction to Biology Laboratory for non-science majors.
- 7/2013 - 6/2015 **Laboratory Management**, Quicksilver Scientific, Inc. Lafayette, CO.
Trained employees in direct support to healthcare practitioners for report interpretation, manufacture of liposomal delivery systems for detoxification products and analytical positions using HPLC, ICP-MS and UV-Vis spectroscopy techniques.
- 2006 - 2008 **General Chemistry Tutor**, SUNY-ESF, Syracuse, NY.
-

Employment History

- 8/2015 - Present **Graduate Teaching Assistant**, University of Tennessee Knoxville, Knoxville, TN.
Cellular and Comparative Biochemistry Laboratory (BCMB 419).
- 8/2015 - Present **Graduate Research Assistant**, University of Tennessee Knoxville, Knoxville, TN.
Dept: Biochemistry & Cellular and Molecular Biology. PI: Dr. Barry D. Bruce.
- 10/2013 **Partner** and part owner of Quicksilver Scientific, Inc. Lafayette, CO. International clinical laboratory, CLIA, FDA and NELAC certified.
- 6/2011- 6/2015 **Chief Analyst and Research Scientist** at Quicksilver Scientific, Inc.
Duties: Analysis of environmental and human samples for various forms of mercury and other toxic and nutrient metals. Engaged in the development and manufacture of liposomal supplement products to aid in human detoxification of heavy metals.
- 3/2010 - 6/2011 **Research Chemist** at Quicksilver Scientific, Inc. under Dr. Christopher Shade.
Designed and conducted experiments, which included the synthesis of various metallic nanoparticles and observation of specific catalytic properties in aqueous systems.
- 8/2009 - 11/2009 **Sample Preparation Chemist** at Life Science Laboratories, Syracuse, NY.
Employed in the Inorganic Technical Center. Primary duty entailed the preparation and digestion of sediment, water, food and municipal waste to be analyzed by ICP-OES and ICP-MS for heavy metals contamination.

*References available upon request.

Last Updated: 3/9/2020