Liam Sharp | Curriculum Vitae

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I recieved my Ph.D. from Rutgers University in Computational and Integrative Biology under the mentorship of Dr. Grace Brannigans lab. My dissertation aims to elucidate the boundary lipid composition of the nicotinic acetylcholine receptor (nAChR) in both model and realistic neuronal membranes using coarse-grained molecular dynamics simulations, I also show how other pentameric ligand-gated ion channels (pLGICs), such as the bacterial channel ELIC, sort lipids. Though my background is research heavy, my interests lie more in scientific service, scientific education, and scientific communicating .

Education & Training

Training

- **University of Delaware** — **Newark, DE**
  Postdoc under Dr. Edward Lyman — *2021-Present*

Academics

- **Rutgers University** — **Camden, NJ**
  Computational and Integrative Biology, PhD — *2016-2021*
  Thesis: *Boundary lipids of pentameric ligand-gated ion channels in model and native membranes*
  Defended with Distinction
- **Rutgers University** — **Camden, NJ**
  Computational and Integrative Biology, MS — *2014-2016*
- **Juniata College** — **Huntingdon, PA**
  Physics, BS — *2008–2012*

Certificates

- **2019 Software Carpentry** Software Carpentries Instructor
- **2015 Rutgers University Camden** Level I Tutor
- **2012 Pennsylvania State University** Nanofabrication Manufacturing Technology (NMT) Capstone Semester

Publications

- **2021**: Liam Sharp, Grace Brannigan, *Spontaneous lipid binding to the nicotinic acetylcholine receptor in a native membrane*, AIP - The Journal of Chemical Physics, https://doi.org/10.1063/5.0046333
- **2019**: Liam Sharp, Reza Salari, Grace Brannigan, *Boundary lipids of the nicotinic acetylcholine receptor: Spontaneous partitioning via coarse-grained molecular dynamics simulation*, Biochimica et Biophysica Acta (BBA) - Biomembranes, ISSN 0005-2736, https://doi.org/10.1016/j.bbamem.2019.01.005.
- **2019**: Kristen Woods*, Liam Sharp*, Grace Brannigan, *Untangling direct and domain-mediated interactions between nicotinic acetylcholine receptors in dha-rich membranes*, The Journal of membrane biology, ISSN 0022-2631, https://doi.org/10.1007/s00232-019-00079-0.
  *Joint first author.
- **2019**: Ailing Tong, John T. Petroff II, Fong-Fu Hsu, Philipp A. M. Schmidpeter, Crina M. Nimigean, Liam Sharp, Grace Brannigan, Wayland W. L. Cheng, *Direct Binding of Phosphatidylglycerol at Specific Sites Modulates Desensitization of a Pentameric Ligand-Gated Ion Channel*, eLife, doi: 10.7554/eLife.50766.
  I ran coarse-grained simulations of ELIC in membranes containing PG, which were validated by our experimental collaborators.

Leadership Experience

Leadership Roles

- Co-Computational Chair for Center for Computational and Integrative Biology's student run organization. This position is shared with an Experimental Chair and a Sitting President. Assists with:
  - Planning student social and student informational events.
  - Leading discussions on interdisciplinary papers.
  - Communicating student issues and concerns with the Director and Graduate Director.
  - Welcoming and discussing CCIB's graduate school philosophy and goals with prospective and new students.
  - Presenting UCIB's mission statement and philosophy at undergraduate open houses.
- CCIB Graduate Student Liaison with the Graduate Student Union Representative. I was in charge of keeping in contact with the union, bringing up issues students have with university related concerns, and setting up meeting with our center's students and the union representative (2019-2020).

- Group leader for student support groups during Covid-19.
- Senior graduate student within the Brannigan Lab.
  - Assisted in training and mentoring two undergraduate (2018-2019)
  - Assisted in training and mentoring four master's students through out my PhD.
  - Assisted with keeping computers and users up to date with IT.
  - On occasion, led lab group meetings.
  - Discussed approaches, concerns, and solutions dealing with peers research.
  - Assisted with daily lab maintenance and reporting lab issues.
  - Assisted maintaining lab git repository
  - Assisted with benchmarking molecular dynamic simulations for various allocation grants.
  - Assisted with developing computational lab manuals for training.

Teaching

- Developed, adapted, and maintained curriculums for algebra and mathematical physics courses.
- Participated in approximately 10 educational training sessions through Rutgers Camden Learning Center and the Biophysics Society Annual Conference.
- Took part in Software Carpentry Instructor reviews and updates three times a year .
- Taught classes as small as three students and as large as thirty-five.
- Tutored one-on-one in math and physics during my MS.

Courses Taught

- **Spring Semester 2019:**
  Mathematical Physics (3 credits)
- **Fall Semester 2018:**
  Introductory Physics Lab (1 credits)
- **Fall Semester 2018:**
  Substitue Algebra instructor (4 creids)
- **2017-2018:**
  Advanced Algebra (4 credits)
- **2016-2017:**
  Introductory Algebra (3 credits)

Additional Teaching Experience

- **Fall 2020:** Guided Programing with Git in Software Carpentry Workshop
- **Fall 2019:** Guided Data Organization in Spreadsheets and Introduction to R in Data Carpentry Workshop.
- **Summer 2019:** Guided Programing with Python in Software Carpentry Workshop.
- **Spring 2019:** Guided Programing with Python in Software Carpentry Workshop.
- **Fall 2014-Spring 2016** Tutor at Rutgers University Camden Learning Center.

Additional Experiences

- **Internship Summer 2011** University of Pennsylvania, High Energy Physics Laboratory: Developed code to track annealing rate of irradiated transistors.

Presentations

- **2020 Seminar:** Nicotinic Acetylcholine Receptors Lipid Preferences Within Complex Quasi-Native Membranes, Center for Computational and Integrative Biology, Rutgers University Camden, NJ 2020.
- **2020 Poster:** Nicotinic Acetylcholine Receptors Lipid Preferences Within Complex Quasi-Native Membranes, Biophysical Society Annual Meeting, San Diego, CA 2020.
- **2019 Demonstrations:** Science Carnival, Science on the Parkway, Science Week, Philadelphia, PA 2019.
- **2019 Seminar:** Boundary Lipids Of The Nicotinic Acetylcholine Receptor In Quasi-Native Membranes, Q-Step, Rutgers University Camden, NJ 2019.
- **2019 Poster:** Boundary Lipids Of The Nicotinic Acetylcholine Receptor In Quasi-Native Membranes, Biophysical Society Annual Meeting, Baltimore, MD 2019.
- **2018 Seminar:** Boundary Lipids of the Nicotinic Acetylcholine Receptor in Quasi-Native Membranes, Center For Computational and Integrative Biology, Rutgers University, Camden, NJ. 2018.
- **2018 Poster:** Iinteractions of nicotinic acetylcholine receptors with cholesterol and polyunsaturated fatty acids in model, native-like, and oocyte membranes. Biophysical Society Annual Meeting, San Fransisco, CA. 2018.
- **2017 Seminar:** A Coarse Grained Study of Nicotinic Acetylcholine Receptor-Lipid Interactions, Center For Computational and Integrative Biology, Rutgers University, Camden, NJ. 2017.
- **2017 Poster:** Interactions of nicotinic acetylcholine receptors with liquid-disordered domains rich in n-3 polyunsaturated fatty acids. Biophysical Society Annual Meeting, New Orleans, LA. 2017.
- **2016 Poster:** Effects of quasi-native lipid composition on membrane domain formation induced by nicotinic acetylcholine receptors. Biophysical Society Annual Meeting, Los Angeles, CA. 2016.

Awards and Allocations:

- **2019** CCIB Best Paper Award (3rd Place)
- **2019** The Rutgers Office of Advanced Research Computing Allocation; ∼30000000 Service Units Allotted
- **2018** CCIB Best Poster Award (3rd Place)

Technical skills

- **Programming Languages:** Proficient in: Python, TCL, Bash.
- **Industry Software Skills:** GROMACS, VMD, Slurm, Spyder, MATLAB, Linux, git, TeX.