Philip Schmiege, PhD

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Accomplished biophysicist with ten years of experience in structural biology and biochemical experimental design seeking to leverage scientific expertise in pharmaceutical business development. Track record of publishing in high-impact journals (*Cell*, *Nature*, and *Science*), demonstrating clear and effective scientific communication. Adept at cultivating strategic collaborations across both academic and a variety of industry sectors, with a focus of driving innovation and translating research.

EDUCATION

UT Southwestern Medical Center, PhD in Molecular Biophysics, August 2019 – November 2023
Mentor: Dr. Xiaochun Li, Department of Molecular Genetics
Committee: Dr. Weiwei Wang, Dr. Russell DeBose-Boyd, Dr. Yunsun Nam, and Dr. Ryan Hibbs
Thesis: Structures and Mechanisms of Lysosomal Transporters

Boston University, BA in Biology with honors, minor in marine science, May 2014
Cum Laude; University Scholar
Mentor: Dr. Peter Buston
Thesis: Behavioral traits of Anemonefish affect the Anemone – Anemonefish Mutualism

EXPERIENCE

UT Southwestern Medical Center, June 2017 – Present
Research & Development Senior Scientist, Li Lab
PhD Researcher, Li Lab
Research Associate/Lab Manager, Li Lab

- Researching the structure and mechanism of endolysosomal membrane transporters and channels that are implicated in various developmental diseases with the hopes of aiding therapeutic design.
- Designing and managing a total of 6 research projects (completed and ongoing), leading collaborations with other labs, CROs, and multiple industry partners.
- Overseeing operations, training, and managing industry collaborations and therapeutic design projects of a 12-person lab in the department headed by Nobel laureates Dr. Joseph Goldstein and Dr. Michael Brown.

Manhattan Project Beer Co., January 2020 – Present
Microbiologist

- Designing laboratory space, developing laboratory QA/QC protocols, and microbiological testing protocols for a 15,000+ bbl/year craft brewery shipping throughout Texas.
- Managing and maintaining yeast library of 30+ yeast strains, for both experimental and production batches.
- Research and development of flavor profiles, new beer styles, and new yeast strains for craft beer market.

Stealth Startup, July 2022 – February 2024
Business Management Intern

- Researched the mechanism of action of groundbreaking cancer targeting medication.
- Facilitated fundraising by writing and editing funding proposals of $3-5 million for initial phase 1 clinical trials, as well as built deck slides on the scientific background for investor pitches.

Assisted with preparation for Pre-IND meeting with the FDA to align on pre-clinical development plans as well as non-dilutive funding efforts through CPRIT.

UT Southwestern Students Emerging Academy of Leaders (SEALs), August 2022 – August 2023
Leader

- Designed and led seminar series providing professional and personal opportunities for graduate students.

The Rockefeller University/Howard Hughes Medical Institute, January 2015 – May 2017
Research Technician, Blobel Lab

- Elucidated the role of the TRanscription-EXport (TREX) complex in nuclear mRNA export, and Neiman Pick C1 (NPC1) in cholesterol transport within the cell in the lab of Nobel laureate Dr. Günter Blobel.

Marine Research Lab, Boston University, May 2014 – August 2014
Field Research Assistant

- Mapped sub-surface currents and temperatures of the Belizean Barrier Reef by deploying and tracking 24 NOAA SVP drifters to help inform future decisions regarding the boundaries of marine protected areas.

Biology Honors and Undergraduate Research, Boston University, September 2012 – May 2014

Student Researcher, Buston Lab

- Designed, and defended original research project on the anemone – anemonefish mutualism of the orange clownfish *Amphiprion percula i*ncluding all statistical analysis in R, aquarium maintenance, and fish care.

SELECTED PAPERS

1. **Schmiege P**, Shaikh H, Lambert M, Xing Z, Herz J, Li X (2026). Structures of the human endosomal Na^+/H^+ exchanger NHE6. *Structure*, in press.
2. Hu Q, Li D, Long T, Sun Y, Junge HJ, **Schmiege P**, Li X (2026). Architecture of the Norrin signaling complex and structure-guided surrogate design. *NSMB* 10.1038/s41594-026-01909-1.
3. **Schmiege P***, Jaslan D*, Fine M, Sadanandan NP, Hatton A, Elghobashi-Meinhardt N, Grimm C, Li X (2025). TRPML2 in distinct states reveals the activation and modulation principles of the TRPML family. *Nature Communications* 10.1038/s41467-025-60710-8
4. Chen H, Ha HTT, Elghobashi-Meinhardt N, Le NA, **Schmiege P**, Nguyen LN, Li X (2025). Molecular basis of Spns1-mediated lysophospholipid transport from the lysosome. *Proceedings of the National Academy of Sciences* 10.1073/pnas.2409596121
5. **Schmiege P**, Li X (2024). Clues into Wnt cell surface signalosomes and its biogenesis. *Trends in Biochemical Sciences* 10.1016/j.tibs.2024.09.007
6. Long T, Li D, Vale G, Jiang Y, **Schmiege P**, Yang ZJ, McDonald JG, Li X (2024). Molecular insights into human phosphatidylserine synthase 1 reveal its inhibition promotes LDL uptake. *Cell* 10.1016/j.cell.2024.08.004
7. **Schmiege P**, Donnelly L, Elghobashi-Meinhardt N, Lee C-H, Li X (2024). Structure and inhibition of the human lysosomal transporter Sialin. *Nature Communications* 10.1038/s41467-024-48535-3
8. Guo X*, **Schmiege P***, Assafa TE*, Wang R, Xu Y, Donnelly L, Fine M, Ni X, Jiang J, Millhauser G, Feng L, Li X (2022). Structure and mechanism of human cystine exporter cystinosin. *Cell* 10.1016/j.cell.2022.08.020
9. Qi X, **Schmiege P**, Esparza L, Li X (2022). Expression, Purification, and Structural Determination of Human PTCH1–HH-N Complexes. *Methods in Molecular Biology* 10.1007/978-1-0716-1701-4_10
10. **Schmiege P***, Fine M*, Li X (2021). Atomic insights into ML-SI3 mediated human TRPML1 inhibition. *Structure* 10.1016/j.str.2021.06.003
11. Wang R, Qi X, **Schmiege P**, Coutavas E, Li X (2020). Marked structural rearrangement of mannose 6-phosphate/IGF2 receptor at different pH environments. *Science Advances* 6:eaaz1466.
12. Fine M*, **Schmiege P***, Li X (2018). Structural basis for $PtdInsP_2$-mediated human TRPML1 regulation. *Nature Communications* 10.1038/s41467-018-06493-7.
13. Qi X, **Schmiege P**, Coutavas E, Li X (2018). Two Patched molecules engage distinct sites on Hedgehog yielding a signaling-competent complex. *Science* 362:52. pii: aas8843.
14. Qi X*, **Schmiege P***, Coutavas E, Wang J, Li X (2018). Structures of Human Patched and its complex with native palmitoylated sonic hedgehog. *Nature* 560(7716): 128-132.
15. **Schmiege P***, Fine M*, Li X (2018). The regulatory mechanism of TRPMLs revealed by Cryo-EM. *The FEBS Journal* 285: 2579-2585.
16. **Schmiege P***, Fine M*, Blobel G, Li X (2017). Human TRPML1 channel structures in open and closed conformations. *Nature* 550(7676): 366-370.
17. Li X, Lu F, Trinh MN, **Schmiege P**, Seemann J, Wang J, Blobel G (2017). 3.3 Å structure of Niemann-Pick C1 protein reveals insights into the function of the C-terminal luminal domain in cholesterol transport. *PNAS* 114(34): 9116-9121.
18. Ren Y, **Schmiege P**, Blobel G (2017). Structural and biochemical analyses of the DEAD-box ATPase Sub2 in association with THO or Yra1. *eLife* 2017;6:e20070.
19. **Schmiege PFP**, D'Aloia CC, Buston PM (2017). Anemonefish personalities influence the strength of mutualistic interactions with host sea anemones. *Marine Biology* 164(24).

* Co-first author

PATENTS

Schmiege P, Donnelly L, Li X (2022). Anti-Human Cystinosin Antibodies and Methods of Use Thereof. US Patent 2024/0002528 A1

AWARDS

2022 – NIH NICHD F31 Fellowship (3 years) | $114,078

2020 – NIH T32 Molecular Biophysics Training Grant (2 years) | $62,550

2014 – Boston University Biology Department Travel Award | $600

2013 – Boston University Undergraduate Opportunities Program Funding | $4,200

2012 – Boston University Undergraduate Opportunities Program Funding | $1,400

MEETINGS

2026 – J.E. Dumont Meeting: Phosphoinositides | Alsace, France

2026 – Gordon Research Conference on Ion Channels | South Hadley, MA*

2025 – Michael, Marcia, and Christa Parseghian Scientific Conference for NPC Research | Tucson, AZ

2024 – Michael, Marcia, and Christa Parseghian Scientific Conference for NPC Research | Tucson, AZ

2023 – Cell Symposia: Structural biology from the nanoscale to cellular mesoscale | Huangshan, China*

2023 – Mechanisms of Membrane Transport | Les Diablerets, Switzerland

2022 – FASEB Protein Lipidation Conference: Enzymology, Signaling, and Therapeutics | Saxtons River, VT

2022 – Gordon Research Conference on Ligand Recognition and Molecular Gating | Lucca, Italy*

2018 – Michael, Marcia, and Christa Parseghian Scientific Conference for NPC Research | Tucson, AZ

2014 – Ecological Society of America Annual Meeting | Sacramento, CA*

2014 – Boston University Honors Thesis Defense | Boston, MA*

2014 – Boston University Annual UROP Symposium | Boston, MA*

* Presented with talk or poster

OTHER EDUCATION

Alloy Futures Biotech Startup Academy, Alloy Therapeutics, October 2025 – November 2025

Biotech Primer Drug Discovery Course, Certificate of Completion, July 2024

Antarctic Circumnavigation Expedition Maritime University, Student, November 2016 – December 2016

Universidad San Francisco de Quito, Ecuador Study Abroad Program, January 2013 – May 2013

SKILLS

Structural Biology: cryo-EM (single particle reconstruction), X-ray crystallography, negative stain EM, protein purification, membrane protein biochemistry, molecular dynamics and ligand docking fundamentals.

AI-Assisted Development: Python, Google Sheets API, HTML/CSS generation, experience with major LLMs including Claude, ChatGPT, Ollama, Phylo.

Computational: Unix/Linux command line, GPU workstation administration, cryo-EM processing and structural refinement pipelines (CryoSPARC, RELION, Coot, Chimera, ISOLDE, Phenix, MolProbity), protein structure prediction (AlphaFold, Boltz-2), molecular visualization, de novo protein design pipelines.

Experimental Biology: SSM electrophysiology, gel electrophoresis, tissue culture, construct design, molecular cloning, confocal microscopy, immunofluorescence, flow cytometry, transport assays, QC microbiology.

Communication & Business: scientific writing and publication, cross-functional team coordination, conference presentations, investor pitch development, project management, industry partner management.

Field & Marine: PADI Advanced Open Water SCUBA, Water-quality testing, Live animal care