

E. NICHOLAS PETERSEN

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EDUCATION

- 2019 The Scripps Research Institute**
Doctor of Philosophy, *Chemical and Biological Sciences*
- 2012 Brigham Young University**, Provo, UT
Bachelor of Science, *Biochemistry*
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RESEARCH

- 2020-Present HHMI/Brandeis University**
Postdoctoral Associate – Rosbash Laboratory
Used confocal imaging, molecular and structural biology, biochemistry, and animal behavior to elucidate the underlying mechanisms of circadian rhythms. My structure-led approach resulting in the discovery of the longest circadian period mutants measured as well as a novel mechanism for temperature compensation.
- 2012-19 The Scripps Research Institute**
Graduate Student/Postdoc – Hansen Laboratory
Used advanced microscopy (STORM, SIM) and novel *in vivo* techniques to discover the role of lipid raft disruption in the mechanical activation of the lipase, phospholipase D. This is a fundamental mechanism of mechanosensation. Observed that disruption of this pathway leads to misregulation of mechanical stimulation in *Drosophila*.
- 2010-12 Brigham Young University**
Research Assistant – Buskirk Laboratory
Two-hybrid selection and radioactive pulse-chase experiments were used to discover a role for ribosome-stalling mRNA sequences in the regulation of protein transcription in *E. coli*.
- 2008-10 Research Assistant** – Petersen Laboratory
Improved reaction kinetics and reduced steps needed to synthesize adenosine-based anti-cancer compounds as part of a SAR against the NCI-cancer lines.
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PUBLICATIONS

ORCID: <https://orcid.org/0000-0002-3243-9611>

E. N. Petersen, C. Sullivan, H. Ludewig, D. Kern, M. Rosbash. The dramatic impact of the PER-DBT interaction on circadian timekeeping and temperature compensation, bioRxiv [preprint]. 2025. Available from www.biorxiv.org/content/10.1101/2025.02.01.636007v2. doi: www.doi.org/10.1101/2025.02.01.636007

E. N. Petersen, M. Gudheti, K. R. Murphy, W. W. Ja, E. M. Jorgensen, S. B. Hansen. Mechanical activation of TWIK-related potassium channel by nanoscopic movement and rapid second messenger signaling. *eLife*, 2023, <https://doi.org/10.7554/eLife.89465.1>.

E. N. Petersen, M.A. Pavel, H. Wang, S. B. Hansen. Disruption of palmitate-mediated localization: a shared pathway of force and anesthetic activation of TREK-1 channels. *BBA – Biomembranes*, 2020, <https://doi.org/10.1016/j.bbamem.2019.183091>

S. B. Hansen, R. A. Learner, M. A. Pavel, E. N. Petersen. Reply to van Swinderen and Hines: Drosophila model establishes the lipid membrane as a target of anesthetics. *Proc Natl Acad Sci.*; 2020 Sep;117(40):24629–24629

M. A. Pavel, E. N. Petersen, R. A. Lerner, S. B. Hansen. Studies on the Mechanism of General Anesthesia. *Proc Natl Acad Sci U S A*. 2020 Jun 16;117(24):13757–13766. doi: 10.1073/pnas.2004259117.

H.-W. Chung*, E. N. Petersen*, C. Cabanos, K. R. Murphy, W. W. Ja, and S. B. Hansen. A Molecular Target for an Alcohol Chain Length Cutoff. *Journal of Molecular Biology*, vol. 431, pp. 196–209, 2019.

E. N. Petersen, C. R. Clowes, S. B. Hansen. Measuring anesthetic resistance in *Drosophila* by VAAPR. bioRxiv. [preprint]. 2019 October. Available from: <https://www.biorxiv.org/content/10.1101/797209v1>. doi: <https://doi.org/10.1101/797209>.

M. A. Pavel, H.-W. Chung, **E. N. Petersen**, S. B. Hansen, Polymodal Mechanism for TWIK-Related K⁺ Channel Inhibition by Local Anesthetic. *Anesthesia & Analgesia* **129**, 973 (2019).

E. N. Petersen, H.-W. Chung, A. Nayeibosadri, and S. B. Hansen. Kinetic disruption of lipid rafts is a mechanosensor for phospholipase D. *Nat. Commun.*, vol. 7, pp. 1–8, 2016.

C. J. Woolstenhulme, S. Parajuli, D. W. Healey, D. P. Valverde, **E. N. Petersen**, A. L. Starosta, N. R. Guydosh, W. E. Johnson, D. N. Wilson, and A. R. Buskirk. Nascent peptides that block protein synthesis in bacteria. *Proc. Natl. Acad. Sci.*, vol. 110, no. 10, pp. E878–E887, 2013.

FUNDING

2019-21 **Neurobiology Training Grant**, NIH T32

2015-16 **Scheller Graduate Student Fellowship**, The RJ Foundation

2012-15 **Richard & Helen DeVos Graduate Fellowship**, The Scripps Research Institute

2012 **ORCA Research Grant**, Office of Research and Creative Activities, BYU

2010-12 **Mentored Research Award**, Physical and Mathematical Sciences Department, BYU
Awarded three times

INVITED TALKS

2026 Society for Research on Biological Rhythms – Amelia Island, FL
Brandeis Postdoctoral Symposium – Waltham, MA

2025 Society for Neuroscience – San Diego, CA
Department of Pathology at Brigham and Women's Hospital – Boston, MA

OTHER PRESENTATIONS AND AWARDS

2024 Society for Research on Biological Rhythms – San Juan, PR

2022 Society for Research on Biological Rhythms – Amelia Island, FL

2019 Keystone Conference, Mammalian Sensory Systems – Seattle, WA

2018 GRC, Ligand Recognition and Molecular Gating – Ventura, CA

2017 Biophysical Society Annual Meeting – New Orleans, LA

2016 FEBS Advanced Course: Lipid-protein interactions and organelle function – Spetses, Greece
Best poster award - €300 award

2015 Scripps Graduate Program Retreat
Best presentation award - \$3000 award

LEADERSHIP & STRATEGIC MANAGEMENT

The Scripps Research Institute & Brandeis University

Mentorship and Scientific Training

Supervision and Training: Directly managed and trained a diverse cohort of 10+ researchers including high school, undergraduate, and graduate students across various molecular biology and biochemistry disciplines

Research Design: Developed individualized research plans for mentees focusing on transformation from technical training to independent project ownership and data presentation

Career Development: Conducted regular one-on-one mentorship sessions to discuss career goals and help navigate graduate school applications and industry transitions

The Scripps Research Institute

Graduate Student Council

Program Development: Founded and managed a communication mentorship program, pairing senior researchers with incoming graduate students to improve presentation style and scientific storytelling

Operations and Logistics: Orchestrated the annual recruitment logistics for incoming PhD candidates helping to manage schedules and hospitality for recruits.

Community Building: Planned and executed large-scale events and activities for the student body to foster interdepartmental collaboration and student retention

The Church of Jesus Christ of Latter-day Saints

Elders Quorum President

Organizational Leadership: Directed a local organization of 50+ members overseeing long-term strategic planning

Personnel Development: Managed and mentored a leadership team; conducted regular performance check-ins and personal development coaching for the broader membership

Stakeholder Coordination: Liaised between executive local and regional boards and members to implement global initiatives at a local level ensuring policy compliance and community engagement

Crisis & Resource Management: Coordinated emergency response and aid (food, housing, employment) for individuals in need including conflict management.

Executive Secretary

Administrative Oversight: Managed the executive calendar and confidential records for senior executives prioritizing high-value tasks and streamlining communication workflows

Cross-functional Collaboration: Facilitated communication between disparate department heads to ensure alignment with organizational goals and efficient use of shared resources.

OUTREACH & TEACHING

2025 Instructor, Quantitative Biology Seminar, Brandeis University

Facilitated high-level scientific discourse and curriculum alignment for multi-disciplinary researchers

2013-14 Instructor, Basics of Spectroscopy, The Scripps Research Institute

Regularly taught a continuing education course for local high-school teachers

2012-13 Science Saturday Community Outreach, The Scripps Research Institute

Planned and participated in this annual event exposing the general public to the research at TSRI