

Rezvan Shahoei

Education

- Ph.D., Physics** University of Illinois at Urbana-Champaign (UIUC), 2020
Thesis Title: Computational Modeling and Simulation of Ligand-Gated Ion Channels
Advisor: Emad Tajkhorshid (2017–2020)
Advisor: Klaus Schulten (2012–2016)
- M.Sc., Physics** Sharif University of Technology, Iran, 2010
Thesis Title: Abelian Sandpile Models and Surface Growth
Advisor: Saman Moghimi-Araghi
- B.Sc., Physics** University of Tehran, Iran, 2008

Research Interests

- Machine Learning Applications in Computational Biology
- Molecular Modeling and Simulation of Biomolecular Systems
- Computer-Aided Drug Discovery and Design
- Enhanced Sampling Techniques
- Free Energy Calculations
- Protein-Small Molecule Interactions
- Membrane Biophysics
- Statistical Mechanics

Publications

- **R. Shahoei** and E. Tajkhorshid (2020) Menthol binding to the human $\alpha 4\beta 2$ nicotinic acetylcholine receptor, facilitated by its strong partitioning in membrane. *J. Phys. Chem. B*, **124(10)**: 1866–1880
- J. Yu, H. Zhu, R. Lape, T. Greiner, **R. Shahoei**, Y. Wang, J. Du, W. Lü, E. Tajkhorshid, L. Sivilotti, and E. Gouaux (2019) Mechanism of gating and partial agonist action in the glycine receptor. **Available on bioRxiv**
- B. J. Henderson, S. Grant, B. W. Chu, **R. Shahoei**, S. M. Huard, S. S. M. Saladi, E. Tajkhorshid, D. A. Dougherty, and H. A. Lester (2018) Menthol stereoisomers exhibit different effects on $\alpha 4\beta 2$ nAChR upregulation and dopamine neuron spontaneous firing. *eNeuro*, **5(6)**. pii: ENEURO.0465-18.2018
- A. Chakravarti, K. Selvadurai, **R. Shahoei**, H. Lee, S. Fatma, E. Tajkhorshid, and R. Huang (2018) Reconstitution and substrate specificity of the antiviral radical SAM enzyme viperin. *J. Biol. Chem.*, **293(36)**: 14122–14133
- S. Maji, **R. Shahoei**, K. Schulten, and J. Frank (2017) Quantitative Characterization of Domain Motions in Molecular Machines. *J. Phys. Chem. B*, **121(15)**: 3747–3756

Presentations

Lectures

- Menthol binds to extracellular and transmembrane domains of the human $\alpha 4\beta 2$ nicotinic receptor. 63rd Annual Meeting of the Biophysical Society, Baltimore (March 2019)
- Menthol's interaction with membrane and human nicotinic receptor. CPLC/CBQB Graduate Student and Postdoc Symposium, UIUC (April 2018)
- Structure and function of YidC. Physics of Living Systems Student Research Network, University of Maryland (July 2015)

Posters

- A comparative study of YidC, a ribosome-bound membrane protein insertase. insertase. Gordon Research Conference on Membrane Protein Folding, Stonehill College (June 2017)
- Critical decoding step in the ribosome revealed by dynamical network analysis. 58th Annual Meeting of the Biophysical Society, San Francisco (February 2014)
- Critical decoding step in the ribosome carried out by dynamical network analysis. Physics of Living Systems Student Research Network, Princeton University (August 2013)

Teaching

- Physics 427, Thermal and Statistical Physics, Dept. of Physics, UIUC (Spring 2018)
- Physics 554, Non-equilibrium Statistical Mechanics, Dept. of Physics, UIUC (Fall 2014)
- Physics 225, Relativity and Math Applications, Dept. of Physics, UIUC (Fall 2010 & 2011, Spring 2011 & 2012)
- Physics 101, Mechanics and Heat, Dept. of Physics, UIUC (Summer 2011)
- Electromagnetism I, Dept. of Physics, Sharif University of Technology (Fall 2009)
- Classical Mechanics II, Dept. of Physics, University of Tehran (Spring 2008)
- Classical Mechanics I, Dept. of Physics, University of Tehran (Fall 2007)

Other Teaching Experience

- Teaching Assistant, Center for Physics of Living Cells (CPLC) Summer School, Dept. of Physics, UIUC (July 2016)
- Teaching Assistant, Hands-on Workshop on Computational Biophysics, NIH Center for Macromolecular Modeling and Bioinformatics, Beckman Institute, UIUC (October 2012 & 2016)
- Instructor for the physics research class, Farzanegan High School, NODET, Tehran, Iran (Fall 2009)
- Supervisor of students' physics projects, Farzanegan High School, NODET, Tehran, Iran (Fall 2008 & 2009)

Honors and Awards

- Firdawsi Science Fellowship Award, UIUC (2018–2019)
- Graduate Student Travel Award, Dept. of Physics, UIUC (Spring 2019)
- Mavis Future Faculty Fellow, Engineering College, UIUC (2017–2018)
- Graduate Student Travel Award, Dept. of Physics, UIUC (Spring 2015)
- University Fellowship, Dept. of Physics, UIUC (Spring 2014)

- University Fellowship for Excellence in Teaching Undergraduate Courses, Dept. of Physics, UIUC (Fall 2012)
- Scott Anderson Award for Outstanding Teaching, Dept. of Physics, UIUC (2011)
- Ranked 1st in the class, Dept. of Physics, University of Tehran (2004–2008)
- Ranked 4th in the National Physics Olympiad for Undergraduate Physics Students (Spring 2007)

Certificates

- Applied Machine Learning: Algorithms by LinkedIn Learning (2020)
- Applied Machine Learning: Foundations by LinkedIn Learning (2020)
- **Graduate Teacher Certificate** by the **Center for Innovation in Teaching & Learning** at UIUC (2018)

Conferences and Workshops

- 63rd Annual Meeting of the Biophysical Society, Baltimore (March 2019)
- CPLC/CBQB Graduate Student and Postdoc Symposium, UIUC (April 2018)
- Gordon Research Conference on Membrane Protein Folding, Stonehill College (June 2017)
- The Third Coast Workshop on Biological Cryo-EM, University of Chicago (March 2017)
- Physics of Living Systems Student Research Network, University of Maryland (July 2015)
- 59th Annual Meeting of the Biophysical Society, Baltimore (February 2015)
- 58th Annual Meeting of the Biophysical Society, San Francisco (February 2014)
- Physics of Living Systems Student Research Network, Princeton University (August 2013)
- Physics of Living Systems Student Research Network, Yale University (July 2012)
- Workshop on Large Fluctuations and Collective Phenomena in Disordered Materials, UIUC (May 2011)

Volunteering

- Volunteer for the CPLC Bilingual Education Outreach Program at the International Prep Academy, Champaign, IL (Fall 2016)
- Volunteer for Carl R. Woese Institute for Genomic Biology's Genome day, Champaign, IL (Fall 2014 & 2015)
- Volunteer at the Bike Project of Urbana-Champaign, IL (Spring 2015–Fall 2018)

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