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Education and Training

- Postdoctoral Research Associate, University of Illinois at Urbana-Champaign, Sept.-Dec. 2010. Supervised by Professor Klaus Schulten.
- Ph.D. Physics, University of Illinois at Urbana-Champaign, Aug. 2010. Advised by Professor Klaus Schulten.
- B.A. with honors, Physics, University of Chicago, Jun. 2005.
- B.S. Mathematics, University of Chicago, Jun. 2005

Publications

1. **J. Hsin** and K. Schulten. “Improved Resolution of Tertiary Structure Elasticity in Muscle Protein.” submitted.
2. Y. Liu*, **J. Hsin***, H. Kim, P. R. Selvin, and K. Schulten. “Extension of a three-helix bundle domain of myosin VI and key role of calmodulins.” submitted.
3. M. Şener, J. Strümpfer, **J. Hsin**, D. Chandler, C. Neil Hunter, and K. Schulten. “Förster energy transfer as reflected in the structures of photosynthetic light harvesting systems.” in press, *ChemPhysChem* (2011).
4. W. Chen, J. Lou, **J. Hsin**, K. Schulten, Stephen C. Harvey and C. Zhu. “Molecular dynamics simulations of forced unbending of integrin $\alpha_V\beta_3$.” in press, *PLoS Computational Biology* (2011).
5. **J. Hsin***, J. Strümpfer*, E. H. Lee, and K. Schulten. “The molecular origin of the hierarchical elasticity of titin: simulation, experiment and theory.” in press, *Annual Review of Biophysics* (2011).
6. L. G. Trabuco, E. Schreiner, J. Gumbart, **J. Hsin**, E. Villa, and K. Schulten. “Applications of the molecular dynamics flexible fitting method.” in press, *Journal of Structural Biology* (2011).
7. H.J. Kim*, **J. Hsin***, Y. Liu*, P. R. Selvin, and K. Schulten. “Formation of salt bridges mediates internal dimerization of myosin VI medial tail domain.” *Structure*, 18:1443-1449 (2010). (Previewed by *Thirumalai and Zhang* in the same journal issue.)
8. **J. Hsin***, J. Strümpfer*, M. Şener, P. Qian, C. N. Hunter and K. Schulten. “Energy transfer dynamics in the RC-LH1-PufX core complex-only tubular photosynthetic membrane.” *New Journal of Physics*, 12:085005 (2010).

9. **J. Hsin**, D. E. Chandler, J. Gumbart, C. B. Harrison, M. Şener, J. Strümpfer, and K. Schulten. “Self-assembly of photosynthetic membranes.” *ChemPhysChem*, 11:1154-1159 (2010).
10. E. Lee*, **J. Hsin***, E. von Castelmur, O. Mayans and K. Schulten. “Tertiary and secondary structure elasticity of a Six-Ig titin chain.” *Biophysical Journal*, 98:1085-1095 (2010). (Featured on the cover of the journal issue.)
11. **J. Hsin**, C. Chipot, and K. Schulten. “A glycoporphin A-like framework for the dimerization of light-harvesting core complexes.” *Journal of the American Chemical Society*, 131:17096-17098 (2009).
12. E. Lee, **J. Hsin**, M. Sotomayor, G. Commelas and K. Schulten. “Discovery through the computational microscope.” *Structure*, 17:1295-1306 (2009).
13. **J. Hsin**, J. Gumbart, L. G. Trabuco, E. Villa, P. Qian, C. N. Hunter, and K. Schulten. “Protein-induced membrane curvature investigated through molecular dynamics flexible fitting.” *Biophysical Journal*, 97:321-329 (2009).
14. M. Şener*, **J. Hsin***, L. G. Trabuco, E. Villa, P. Qian, C. N. Hunter, and K. Schulten. “Structural model and excitonic properties of the dimeric RC-LH1-PufX complex from *Rhodobacter sphaeroides*.” *Chemical Physics*, 357:188-197 (2009).
15. **J. Hsin**, A. Arkhipov, Y. Yin, J. E. Stone, and K. Schulten. “Using VMD - an introductory tutorial.” *Current Protocols - Bioinformatics*, 5:Unit 5.7 (2008).
16. D. Chandler*, **J. Hsin***, C. B. Harrison*, J. Gumbart* and K. Schulten. “Intrinsic curvature properties of photosynthetic proteins in chromatophores.” *Biophysical Journal*, 95:2822-2836 (2008).
17. E. Lee, **J. Hsin**, O. Mayans, and K. Schulten. “Secondary and tertiary structure elasticity of titin Z1Z2 and a titin chain model.” *Biophysical Journal*, 93:1719-1735 (2007).
18. F.-J. Lai, **Y.-C. Hsin**, S.-C. Huang, C.-L. Cheng, S.-C. Hsin, M.-C. Hsieh, and S.-J. Shin. “Down-regulation of adrenal neuronal nitric oxide synthase mRNAs and proteins after deoxycorticosterone acetate-salt treatment in rats.” *Journal of Steroid Biochemistry & Molecular Biology*, 101: 197-203 (2006).
19. F.-J. Lai, S.-C. Huang, M.-C. Hsieh, S.-C. Hsin, C.-H. Wu, **Y.-C. Hsin**, and S.-J. Shin. “Upregulation of neuronal nitric oxide synthase mRNA and protein in adrenal medulla of water-deprived rats.” *Journal of Histochemistry & Cytochemistry*, 53: 45-53 (2005).

*: equal contribution authors.

Conference proceedings/Book chapters/Other publications

1. J. Strümpfer, **J. Hsin**, M. Sener, D. Chandler, and K. Schulten. “Introduction to a quantum biological device, the light harvesting apparatus in purple photosynthetic bacteria.” book chapter in *Molecular Machines*, World Scientific Press; edited by Benoit Roux. In press (2011).
2. **J. Hsin**. “Computational investigations of cellular functions: Three cases on membrane morphogenesis, organization and assembly of a multi-protein complex, and the molecular origin of muscle elasticity.” PhD Thesis, University of Illinois at Urbana-Champaign (2010).
3. K. Vandivort, J. C. Phillips, E. Villa, P. L. Freddolino, J. Gumbart, L. G. Trabuco, D. E. Chandler, **J. Hsin**, C. B. Harrison, L. Kale, and K. Schulten. “Long time and large size molecular dynamics simulations made feasible through new TeraGrid hardware and software.” *Proceedings of the 2008 TeraGrid Conference*, (2008). (Winner of the Best Science Track Paper at TeraGrid’08.)

Presentations

1. Talk: “The dimeric photosynthetic core complex generates tubular curvature in bacterial membranes.” CBSB10: From Computational Biophysics to Systems Biology, June 2010. Traverse City, MI.
2. Talk: “Computational investigations on cellular functions: Two cases on membrane morphogenesis and elasticity of mechanical proteins.” Jensen Group (California Institute of Technology), February 2010. Pasadena, CA.
3. Talk: “Discovery through the computational microscope: Two cases on membrane morphogenesis and elasticity of mechanical proteins.” Huang Group (Stanford University), February 2010. Stanford, CA.
4. Poster: “Dimeric photosynthetic core complex generates tubular curvature in membranes.” Keystone Symposia on Molecular and Cellular Biology: Molecular Basis for Biological Membrane Organization and Dynamics, January 2010. Snowbird, UT.
5. Talk: “Protein-induced membrane curvature*.” Biophysics and Computational Biology Symposium (University of Illinois at Urbana-Champaign), May 2009. Urbana, IL.
6. Poster: “Membrane curvature effects and excitonic properties of the bent *Rhodobacter sphaeroides* LH1-RC-PufX dimer.” Light-Harvesting Processes Conference, March 2009. Kloster Banz, Germany.
7. Talk: “Structural systems biology of bacterial photosynthesis.” Workshop on Molecular Modeling on Supercomputers, March 2009. Munich, Germany.
8. Poster: “Membrane curvature effects and excitonic properties of the bent *Rhodobacter sphaeroides* LH1-RC-PufX dimer.” Juelich Winter School 2009 - Multiscale Simulation Methods in Molecular Sciences, March 2009. Juelich, Germany.
9. Poster: “Bending of the chromatophore membrane through core complex dimerization: a molecular dynamics and electron microscopy investigation.” CECAM workshop - Membrane Protein Assembly: Theory and Experiment, September 2008. Lausanne, Switzerland.
10. Poster: “*Rhodobacter sphaeroides* LH1-RC-PufX dimer curves chromatophore membranes.” Biophysical Society Meeting, February 2008. Long Beach, CA.
11. Poster: “Secondary and tertiary structure elasticity of titin Z1Z2 and the titin chain.” Biophysical Society Meeting, March 2007. Baltimore, MD.
12. Talk: “The AWA BPM Project.” American Physical Society Meeting, April 2005. Tampa, FL.

*: Awarded best talk prize.

Teachings

1. Teaching assistant: Computational Biophysics Workshop, July 2010. Scripps Research Institute, San Diego, CA.
2. Teaching assistant: Computational Biophysics Workshop, May 2010. Pittsburgh Supercomputer Center, Pittsburgh, PA.
3. Teaching assistant: graduate course Physics 554 - Non-equilibrium Statistical Mechanics, Fall 2009. (University of Illinois at Urbana-Champaign)
4. Teaching assistant: Center for the Physics of Living Cells, Summer School. July 2009. Champaign, IL.

5. Co-author: “Using VMD*”, 2009.
6. Teaching assistant: Computational Biophysics Workshop, July 2009. Champaign, IL.
7. Co-author: “Shape-Based Coarse Graining†”, 2009.
8. Co-author: “Case Study: Light-Harvesting Complex II§”, 2008.
9. Teaching assistant: Computational Biophysics Workshop, November 2007. Bethesda, MD.
10. Teaching assistant: undergraduate course Physics 211 - Classical Mechanics, Spring 2006; Fall 2005. (University of Illinois at Urbana-Champaign)

*: URL - <http://www.ks.uiuc.edu/Training/Tutorials/vmd/tutorial-html/index.html>

†: URL - <http://www.ks.uiuc.edu/Training/Tutorials/science/coarse-graining/sbcg-tutorial-html/>

§: URL - <http://www.ks.uiuc.edu/Training/CaseStudies/pdfs/lh2.pdf>

Awards and Fellowships

- L. S. Edelheit Family Fellowship, *University of Illinois at Urbana-Champaign*, 2010. Provides an annual graduate fellowship to the best student in biological physics.
- Travel Fellowship, *From Computational Biophysics to Systems Biology Workshop*, June 2010.
- Best talk prize, *University of Illinois at Urbana-Champaign*, Biophysics and Computational Biology Symposium 2009.
- Teachers Ranked as Excellent by their Students, *University of Illinois at Urbana-Champaign*, Fall 2005 and Spring 2006.
- John Haeseler Lewis Prize, *University of Chicago*, 2005. Given in recognition of the best graduating seniors in physics.
- Elected Sigma Xi Associate Member, *Sigma Xi Scientific Research Society*, 2005.

Scientific Societies and Services

- Reviewer, *Proteins: Structure, Function, and Bioinformatics*.
- Co-organizer, Center for the Physics of Living Cells Student Symposium, University of Illinois at Urbana-Champaign, August 2010.
- Member, the American Chemical Society
- Member, the Biophysical Society

Cover Images



E. Lee*, **J. Hsin***, E. von Castelmur, O. Mayans and K. Schulten. "Tertiary and secondary structure elasticity of a Six-Ig titin chain." *Biophysical Journal*, 98:1085-1095 (2010). (DOI: 10.1016/j.bpj.2009.12.4192)

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