

**Daniel W. Shoup, Ph.D.**  
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## Education

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2009-2016	Ph.D. in Biochemistry and Biophysics, Texas A&M University Thesis Title: "The Influence of Substrate on the Chaperone Activity of DnaK"
2002-2006	B.S. in Biochemistry, Minors in Biology and Mathematics, University of North Texas

## Research Experience

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<b>Postdoctoral Researcher</b> 2016-Present	Eugene, Oregon	Lab of Dr. Tristan Ursell University of Oregon
<ul style="list-style-type: none"><li>Investigated the mechanisms of collective behaviors in <i>E. coli</i> such as bioconvection and traveling waves</li><li>Used fast Fourier transformations and autocorrelations to analyze images of complex bacterial patterns in order to discern behavioral variations in <i>E. coli</i> as a result of mutations and environmental factors</li></ul>		
<b>Graduate Research Assistant</b> 2009-2016	College Station, Texas	Lab of Dr. Hays Rye Texas A&M University
<ul style="list-style-type: none"><li>Studied non-native protein aggregate disassembly and protein folding with <i>E. coli</i> chaperone systems</li><li>Used restriction digests/ligations to engineer genes into bacterial plasmids for overexpression in <i>E. coli</i></li><li>Purified proteins with ion exchange, hydrophobic interaction, size exclusion, and affinity chromatography</li><li>Analyzed protein activity and structure with enzymatic assays, ensemble and single particle fluorescence techniques, light scattering, and size exclusion chromatography</li><li>Created programs for analyzing and fitting single particle fluorescence</li></ul>		
<b>Undergraduate Research Assistant</b> 2005-2006	Denton, Texas	Lab of Dr. Stephen Cooke University of North Texas
<ul style="list-style-type: none"><li>Engineered Fabry-Perot resonators and used them to study radio frequency spectra from biomolecules</li></ul>		

## Skills and Qualifications

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### Protein Purification Experience

Proficient with Waters HPLC systems running Breeze/Empower and AKTA FPLC systems running Unicorn; Utilized GE ion exchange, HIC, size exclusion columns, Bio-Rad Ni-NTA affinity columns, and a Vydac C18 reverse phase column

### Analysis Techniques

Adept at SDS-PAGE and native PAGE protein analysis; Familiar with Western Blotting; Competent in enzymatic assays (ATP hydrolysis and carbon fixation) reported via fluorescence, chromatography, absorbance, C-14 incorporation, and either incorporation or cleavage of P-32; Skilled with fluorescence anisotropy, FRET, fluorescence correlation spectroscopy, burst analysis spectroscopy, fluorescence co-localization, and light scattering; Qualified to perform fluorescence, bright field, and dark field microscopy; Capable of cell analysis by flow cytometry; Experienced in DNA techniques such as PCR, ligation, restriction mapping, sequencing

### Software Proficiencies

Experienced in Windows, Mac, and Linux operating systems (Fedora and Ubuntu); Competent in using Microsoft, Libre, and Google office suites; Able to use Adobe Creative Suite (Photoshop, Dreamweaver, and Illustrator) and Image J; Accomplished in using Matlab

### Programming Languages

Capable of coding in Java, HTML, C++, and Python while being most experienced with coding in Matlab

## Teaching Experience

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2010-2015     **Teacher Assistant, Recitation Instructor**, undergraduate biochemistry lecture course, Texas A&M University

## Academic Service Positions

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2010-2011     Graduate Recruiting Officer for the Biochemistry Graduate Student Organization  
2011-2012     Graduate Program Committee Officer for the Biochemistry Graduate Student Organization

## Research Publications

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**Shoup, D.**, Dresser, M., Ursell, T. (2018) The role of metabolism in the behavior of traveling waves of *E. coli*, (Manuscript in Preparation).

**Shoup, D.**, Ursell, T. (2018) Characterization of the bioconvection in *E. coli*, (Manuscript in Preparation).

**Shoup, D.**, Jiang, M., Puchalla, J., and Rye, H., (2018) The influence of aggregate substrates on DnaK-ClpB mediated disaggregation, (Manuscript in Preparation).

**Shoup, D.**, Puchalla, J., and Rye, H., (2018) Development of broad range multi-color burst analysis spectroscopy technique, (Manuscript in Preparation)

**Shoup, D.**, Brooks, A., Kustigian, L., Puchalla, J., Carr, C., and Rye, H., (2015) Single particle fluorescence burst analysis of Epsin induced membrane fission, PLOS ONE, 10:e0119563.

Lin, Z., Puchalla, J., **Shoup, D.**, and Rye, H., (2013) Repetitive unfolding by the trans ring of the GroEL/GroES complex stimulates folding, JBC, 288: 30944-30955.

Etchison, K., Dewberry, C., Kerr, K., **Shoup, D.**, and Cooke, S., (2007) A Fabry-Perot type resonator tunable below 2GHz for use in time domain rotational spectroscopy: Application to the measurement of the radio frequency spectra of bromobenzene and iodobenzene, Journal of Molecular Spectroscopy, 242:39-45.

## References

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Dr. Tristan Ursell, Assistant Professor	Department of Physics	University of Oregon
Dr. Hays Rye, Professor	Biochemistry and Biophysics	Texas A&M University
Dr. Gregory Reinhart, Department Head	Department of Physics	Texas A&M University
Dr. Sarah Bondos, Professor	Molecular and Cellular Science	Texas A&M University
Dr. Jason Puchalla	Department of Physics	Princeton University