

# Brian Koepnick

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<b>Education</b>	<b>University of Washington</b> , Seattle, WA Ph.D. in Biochemistry, advised by David Baker	<b>April 2019</b>
	<b>Wake Forest University</b> , Winston-Salem, NC Bachelor of Science – Biochemistry and Computer Science	<b>May 2012</b>
	<b>North Carolina School of Science and Math</b> , Durham, NC	<b>June 2008</b>

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<b>Research Experience</b>	<b>Research Scientist</b> , Institute for Protein Design, University of Washington Development of Foldit tools for applied protein design Analysis and characterization of <i>de novo</i> designed proteins by Foldit players	<b>2019 – Present</b>
	<b>Graduate Student</b> , University of Washington (David Baker, Ph.D.) Development of protein design tools for citizen scientist Foldit players Analysis and characterization of <i>de novo</i> designed proteins by Foldit players	<b>2012 – 2019</b>
	<b>Lab Assistant</b> , Wake Forest University (Rebecca Alexander, Ph.D.) MD simulations of correlated motions in methionyl-tRNA synthetase Protein engineering and <i>in vitro</i> kinetics studies with radiolabeled <sup>35</sup> S-methionine	<b>2011 – 2012</b>
	<b>Research Intern</b> , NC Central University (Darlene Taylor, Ph.D.) Synthesis of small organic compounds (polyphenylene dimers) Characterization of organic compounds by LC/MS, IR, NMR spectroscopy Theoretical HOMO-LUMO band gap calculations	<b>2007 – 2008</b>

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<b>Publications</b>	<b>Brian Koepnick</b> , Jeff Flatten, Tamir Husain, Alex Ford, Daniel-Adriano Silva, Matt J. Bick, Aaron Bauer, Gaohua Liu, Yojira Ishida, Alexander Boykov, Roger D. Estep, Susan Kleinfelter, Toke Nørdgård-Solano, Linda Wei, Foldit players, Gaetano T. Montelione, Frank DiMaio, Zoran Popović, Firas Khatib, Seth Cooper, David Baker. De novo protein design by citizen scientists. <i>Nature</i> <b>2019</b> .	
	Lorna Dsilva, Shubhi Mittal, <b>Brian Koepnick</b> , Jeff Flatten, Seth Cooper, Scott Horowitz. Creating custom Foldit puzzles for teaching biochemistry. <i>Biochem. Mol. Biol. Educ.</i> <b>2019</b> .	
	Scott Horowitz*, <b>Brian Koepnick*</b> , Raoul Martin*, Agnes Tymieniecki, Amanda A Winburn, Seth Cooper, Jeff Flatten, David S Rogawski, Nicole M Koropatkin, Tsinatkeab T Hailu, Neha Jain, Philipp Koldewey, Logan S Ahlstrom, Matthew R Chapman, Andrew P Sikkema, Meredith A Skiba, Finn P Maloney, Felix R M Beinlich, Foldit Players, University of Michigan students, Zoran Popovic, David Baker, Firas Khatib, and James C A Bardwell. Determining crystal structures through crowdsourcing and coursework. <i>Nature Communications</i> <b>2016</b> , 7, 12549.	
	<b>Brian D. Koepnick</b> , Jeremy S. Lipscomb, Darlene K. Taylor. Effect of substitution on the optical properties and HOMO-LUMO gap of oligomeric polyphenylenes. <i>J. Phys. Chem. A</i> <b>2010</b> , 114, 13228-13233.	

\*shared first authorship

<b>Presentations</b>	<p>“Foldit players design proteins” Talk at RosettaCon Meeting, August 9, 2018</p> <p>Foldit demonstration with Mars, Inc. and ThermoFisher Scientific, Lindau Nobel Laureate Meeting, June 25-29, 2018</p> <p>“Foldit: Solve Puzzles for Science!” Suds &amp; Science Public Talk, ASBMB Annual Meeting 2014</p> <p>“Foldit players design proteins” Poster at RosettaCon Meeting, annually 2013-17</p> <p>“Allosteric mechanisms in methionyl-tRNA synthetase” Poster at Symposium on RNA Biology, RNA Society of North Carolina, October 21-22, 2011</p>	
<b>Awards &amp; Fellowships</b>	<p><b>NSF Graduate Research Fellowship</b> Five-year fellowship with three years of funding for graduate research</p> <p><b>Hurd Fellowship</b>, University of Washington One year of funding for graduate research</p> <p><b>Reynolds Scholarship</b>, Wake Forest University Four-year “full-ride” academic merit scholarship</p>	<p>2014 – 2019</p> <p>2012 – 2013</p> <p>2008 – 2012</p>
<b>Outreach</b>	<p>Foldit booths and demonstrations:</p> <ul style="list-style-type: none"> <li>• Life Sciences Research Weekend/Curiosity Days at Pacific Science Center, Seattle, WA, annually 2013-18</li> <li>• Shoreline Community College STEM Fair, annually 2015-17</li> <li>• Bennett Elementary School Science Fair, annually 2014-16</li> <li>• SciTech Northwest Expo, November 9, 2016</li> <li>• Jane Addams Middle School STEAM Fair, June 14, 2016</li> <li>• Hazel Wolf K-8 School Science Fair, April 21, 2016</li> <li>• Spirtridge School Science Fair, April 20, 2016</li> <li>• Bellevue STEM Career Conference, May 28, 2014</li> </ul> <p>Online communications:</p> <ul style="list-style-type: none"> <li>• Foldit blog: <a href="http://fold.it/portal/blog">http://fold.it/portal/blog</a></li> <li>• Live, scheduled Foldit “science chats”: <a href="http://fold.it/portal/chats">http://fold.it/portal/chats</a></li> </ul>	
<b>Teaching</b>	<p><b>Teaching Assistant</b>, Biochemistry 440, Fall 2013 &amp; Winter 2014 Planning and supervision of weekly quiz/review section, grading exams, office hours</p>	
<b>Skills</b>	<p><b><i>In silico:</i></b> macOS, Linux, Windows C/C++, Python, R, Bash, HTML Rosetta, PyRosetta, PHENIX, HKL2000, Coot, Chimera</p> <p><b><i>In vitro:</i></b> Cloning in <i>E. coli</i>, PCR, Gibson assembly, site-directed mutagenesis, ligation Protein expression and purification SDS-PAGE, FPLC (metal affinity, size exclusion, ion exchange), circular dichroism Bio-layer interferometry X-ray crystallography (data processing, molecular replacement, model building and refinement)</p> <p><b><i>In otio:</i></b> Ukulele, sourdough, crosswords</p>	

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**References**

**David Baker** (Ph.D. advisor)

Professor

University of Washington, Department of Biochemistry

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**Seth Cooper** (collaborator)

Assistant Professor

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**Scott Horowitz** (collaborator)

Assistant Professor

University of Denver, Department of Chemistry and Biochemistry

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