

Curriculum Vitae
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Glenn L. Butterfoss, Ph.D.

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Center for Genomics and Systems Biology, Department of Biology
Department of Computer Science, Courant Institute for Mathematical Sciences
New York University
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Education

- 2003 Ph.D., Biochemistry and Biophysics
University of North Carolina at Chapel Hill
Adviser: Jan Hermans
Dissertation: "Protein Imperfections: Analysis of Side Chain Torsional Deviations in Folded Proteins using X-ray Crystallographic Data and Quantum Mechanical Energy Calculations"
- 1998 B.S., Biochemistry, minor in Biology
University of Delaware
Research Adviser: Mahendra K. Jain

Scientific Employment

- 2006-Present Research Scientist • New York University • *PI:* Richard Bonneau
Departments of Biology & Computer Science
- 2007-2010 Partner • Rosetta Design Group, LLC
- 2009 March Visiting Research Associate • University of Hong Kong • *Host:* Hao Hu
Department of Chemistry
- 2004-2006 Postdoc • University of North Carolina at Chapel Hill • *PI:* Brian Kuhlman
Department of Biochemistry and Biophysics

Selected Teaching and Advising Experience

- 2006-Present Advised projects of several graduate and rotation students in Bonneau lab
- 2010 Ph.D. Thesis committee (Chris Poultney)
- 2007-2009 Onsite training sessions on the Rosetta molecular modeling package at several major pharmaceutical companies

- 2006 "Using The Rosetta Software Package in Systems Biology: Structure Prediction and Protein Design" • Introduction to System Biology Course Institute for Systems Biology • Seattle, Washington
- 2004-2006 Advised projects of several graduate and rotation students in Kuhlman lab
- 1999 Teaching Assistant • UNC

Selected Presentations (*invited seminars)

- 2010 Aug Rosetta Developers Conference • Leavenworth, Washington
- 2010 Aug 7th Peptoid Summit • Berkeley, California
- 2010 Jan Genomics and Systems Biology Workshop • Abu Dhabi, UAE
- 2009 April* National Institute of Environmental Health Sciences • Research Triangle Park, North Carolina • *Host*: Bob London
- 2009 March* The University of Science and Technology of China • Hefei, China
Host: Haiyan Liu
- 2009 March* The University of Hong Kong • Hong Kong, China • *Host*: Hao Hu
- 2008 Aug 6th Peptoid Summit • Berkeley, California
- 2007 Aug Rosetta Developers Conference • Leavenworth, Washington
- 2006 Aug Rosetta Developers Conference • Leavenworth, Washington

Publications (*equal contribution, † corresponding author)

1. Yen Pham, Brian Kuhlman, Glenn L. Butterfoss, Hao Hu, and Charles W. Carter, Jr. (2010) "Tryptophanyl-tRNA synthetase Urzyme: a model to recapitulate molecular evolution and investigate intramolecular complementation" *Journal of Biological Chemistry* (E. pub).
2. Glenn L. Butterfoss, Eugene DeRose, Scott Gabel, Lalith Perera, Joseph Krahn, Geoffrey Mueller, Xunhai Zheng, and Robert London (2010) "Conformational Dependence of ¹³C shielding and coupling constants for methionine methyl groups" *Journal of Biomolecular NMR* **48**, 31-47.
3. Ramesh K. Jha, Andrew Leaver-Fay, Shuangye Yin, Yibing Wu, Glenn L. Butterfoss, Thomas Szyperski, Nikolay V. Dokholyan, Brian Kuhlman (2010) "Computational design of a PAK1 binding protein" *Journal of Molecular Biology* **400**, 257-270.

4. Glenn L. Butterfoss †, P. Douglas Renfrew, Brian Kuhlman, Kent Kirshenbaum, and Richard Bonneau (2009) "A Preliminary Survey of the Peptoid Folding Landscape" *Journal of the American Chemical Society* **131**, 16798–16807.
5. Zhiqiang Liu, Yuying Gosser, Peter James Baker, Yaniv Ravee, Ziyang Lu, Girum Alemu, Huiguang Li, Glenn L. Butterfoss, Xiang-Peng Kong, Richard Gross and Jin Kim Montclare (2009) "Structural and Functional Studies of *Aspergillus oryzae* Cutinase: Enhanced Thermostability and Hydrolytic Activity of Synthetic Ester and Polyester Degradation" *Journal of the American Chemical Society*. **131**, 15711–15716.
6. Neel H. Shah, Glenn L. Butterfoss, Khanh Nguyen, Barney Yoo, Richard Bonneau, Dallas L. Rabenstein and Kent Kirshenbaum (2008) "Oligo(N-aryl glycines): A New Twist on Structured Peptoids " *Journal of the American Chemical Society* **130**, 16622-16632.
7. P. Douglas Renfrew, Glenn L. Butterfoss, and Brian Kuhlman (2008) "Using Quantum Mechanics to Improve Estimates of Amino Acid Side Chain Rotamer Energies" *PROTEINS: Structure, Function, and Bioinformatics* **71**, 1637-1646.
8. Yen Pham, Li Li, Aram Kim, Violetta Weinreb, Glenn L. Butterfoss, Brian Kuhlman, and Charles W. Carter, Jr (2007) "A Minimal TrpRS Catalytic Domain Supports Sense/Antisense Ancestry of Class I and II Aminoacyl-tRNA Synthetases" *Molecular Cell* **25**, 851-862.
9. Andrew Leaver-Fay*, Glenn L. Butterfoss*, Jack Snoeyink, and Brian Kuhlman (2007) A Method for Rapidly Calculating a Solvent Accessible-Surface Area Packing Score During Protein Packing. *J. Comp. Chem.* **28**, 1336-1341.
10. Glenn L. Butterfoss and Brian Kuhlman (2006) Computer-Based Design of Novel Protein Structures. *Annu. Rev. Biophys. Biomol. Struct.* **35**, 49-65.
11. Glenn L. Butterfoss, Jane S. Richardson, and Jan Hermans (2004) Protein imperfections: separating intrinsic from extrinsic variation of torsion angles. *Acta Cryst. D: Biological Crystallography*. **61**, 88-98.
12. Glenn L. Butterfoss and Jan Hermans (2003) Boltzmann-type distribution of side-chain conformation in proteins. *Protein Science* **12**, 2719-2731.
13. Brian G. Miller, Glenn L. Butterfoss, Steven A. Short and Richard V. Wolfenden (2001) Role of enzyme-ribofuranosyl contacts in the ground state and transition state for orotidine 5'-phosphate decarboxylase: a role for substrate destabilization? *Biochemistry* **40**, 6227-6232.
14. Otto G. Berg, Yolanda Cajal, Glenn L. Butterfoss, Ronald L. Grey, Alsina M. Asuncion, Bao-Zhu Yu, and Mahendra K. Jain (1998) Interfacial Activation of Triglyceride Lipase from *Thermomyces (Humicola) lanuginosa*: Kinetic Parameters and a Basis for Control of the Lid. *Biochemistry*, **37**, 6615 -6627.

Submitted Manuscripts

Kevin Drew, Patrick Winters, Glenn L. Butterfoss, Viktors Berstis, Keith Uplinger, Jonathan Armstrong, Michael Riffle, Erik Schweighofer, Bill Bovermann, David R. Goodlett, Trisha N. Davis, Dennis Shasha, Lars Malmström, and Richard Bonneau (2010) Proteome-scale annotation of protein structure and function. *Cell*

Deanne Sammond, Dustin Bosch, Glenn L. Butterfoss, Carrie Purbeck, Mischa Machius, David Siderovski and Brian Kuhlman (2010) Computational Design of the Structure and Sequence of a Protein-Binding Peptid *Journal of the American Chemical Society*

Submitted Grants

2010 Sept Co-PI, Title: Engineering of *Aspergillus oryzae* cutinase to improve its stability and activity on synthetic polyester substrates. NSF Proposal No: 1067415
PI: Richard Gross

Fellowships and Awards

1998-1999 Trainee, Program in Molecular and Cellular Biophysics, UNC
1998 Howard Hughes Medical Institute Summer Research Grant
1998 Best of the Blue Hens Academic/Athletic Scholarship (Men's Swimming)

Other

2010 Invited to review for: Molecular Simulation, Biopolymers: Peptide Science

Primary References

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Additional Collaborators and References

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