BRIAN E. COGGINS
CURRICULUM VITAE

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EDUCATION:

Ph.D., Duke University, Durham, NC, 2007
Biochemistry; Structural Biology and Biophysics
Dissertation: *Development of New Approaches to NMR Data Collection for Protein Structure Determination*, Pei Zhou, advisor

B.S., Duke University, Durham, NC, 2003
Chemistry, with concentration in Biochemistry; minors in History and German language
Thesis: *Structural Studies of the LpxC Enzymes Using Nuclear Magnetic Resonance Spectroscopy*, Christian R.H. Raetz and Pei Zhou, advisors

APPOINTMENTS AND PROFESSIONAL EXPERIENCE:

Assistant Research Professor of Biochemistry, Duke University School of Medicine, 2010-present

Co-Founder, Member/Manager, and CFO, PhD Posters, LLC, 2006-present

Postdoctoral Fellow, Duke University, Durham, NC, 2007–2010

HONORS AND AWARDS:

National Science Foundation Graduate Research Fellowship (2003)
James B. Duke Fellowship, Duke University (2003)
University Scholar, Duke University (2003)
Alternate, Howard Hughes Medical Institute Predoctoral Fellowship (2003)

Graduation *cum laude* and with Distinction in Chemistry, Duke University (2003)
Mac Anderson Foreign Languages Scholarship (2000, for study in the summer term, 2000, at the Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany, in a Duke-administered German language program)
Eagle Scout (1997)

TEACHING:

Duke University, Biochemistry Department: Introduction to Biochemistry (BCH 301)
Course director for summer terms 2008-present, fall terms 2010-present
Typical enrollment 300-400 in fall term, 35-50 in summer term

Duke University, School of Medicine: Molecules and Cells
Ad hoc lecturer to first year medical student course on biochemistry, fall 2012-present

Duke University, Biochemistry Department: Physical Biochemistry (BCH 291)
Teaching assistant, spring term 2005

STUDENTS SUPERVISED FOR UNDERGRADUATE RESEARCH:

Benjamin Villacres, 2012-present
Jesse Bendetson, 2011-2012
Bowen Niu, 2010-2012. Awarded graduation with distinction for thesis.
Katie Apibunyopas, 2010-2011

PUBLICATIONS—JOURNAL ARTICLES:

15. Brian E. Coggins*, Jonathan W. Werner-Allen*, Anthony Yan, and Pei Zhou. "Rapid Protein Global Fold Determination Using Ultrasparse Sampling, High-Dynamic Range Artifact Suppression, and Time-Shared NOESY." *J. Am. Chem. Soc.*, **134**, 18619-18630 (2012).

14. Brian E. Coggins, Ronald A. Venters, and Pei Zhou. "Radial Sampling for Fast NMR: Concepts and Practices Over Three Decades." *Prog. Nucl. Magn. Reson. Spectrosc.*, **57**, 381-419 (2010).

13. Jon W. Werner-Allen, Brian E. Coggins, and Pei Zhou. "Fast Acquisition of High Resolution 4-D Amide-Amide NOESY with Diagonal Suppression, Sparse Sampling and FFT-CLEAN." *J. Magn. Reson.*, **204**, 173-178 (2010).

12. Brian E. Coggins and Pei Zhou. "High Resolution 4-D Spectroscopy with Sparse Concentric Shell Sampling and FFT-CLEAN." *J. Biomol. NMR*, **42**, 225-239 (2008).

11. Brian E. Coggins and Pei Zhou. "Sampling of the NMR Time Domain Along Concentric Rings." *J. Magn. Reson.*, **184**, 207-221 (2007).

10. Brian E. Coggins and Pei Zhou. "Polar Fourier Transforms of Radially-Sampled NMR Data." *J. Magn. Reson.*, **182**, 84-95 (2006).

9. Brian E. Coggins and Pei Zhou. "PR-CALC: A Program for the Reconstruction of NMR Spectra from Projections." *J. Biomol. NMR*, **34**, 179-195 (2006).

8. Brian E. Coggins, Ronald A. Venters, and Pei Zhou. "Filtered Backprojection for the Reconstruction of a High-Resolution (4,2)D CH_3-NH NOESY Spectrum on a 29 kDa Protein." *J. Am. Chem. Soc.*, **127**, 11562-11563 (2005).

7. Ling Jiang, Brian E. Coggins, and Pei Zhou. "Rapid Assignment of Protein Sidechain Resonances Using Projection-Reconstruction of 4D HC(CCO)NH and intra-HC(C)NH Experiments." *J. Magn. Reson.*, **175**, 170-176 (2005).

6. Ronald A. Venters, Brian E. Coggins, Doug Kojetin, John Cavanagh, and Pei Zhou. "(4,2)D Projection-Reconstruction Experiments for Protein Backbone Assignment: Application to Human Carbonic Anhydrase II and Calbindin D_{28K}." *J. Am. Chem. Soc.*, **127**, 8785-8795 (2005).

5. Brian E. Coggins*, Amanda L. McClerren*, Ling Jiang, Xuechen Li, Johannes Rudolph, Ole Hindsgaul, Christian R.H. Raetz, and Pei Zhou. "Refined Solution Structure of the LpxC/TU-514 Complex and pK_a Analysis of an Active Site Histidine: Insights into Mechanism and Inhibitor Design." *Biochemistry*, **44**, 1114-1126 (2005).

4. Brian E. Coggins, Ronald A. Venters, and Pei Zhou. "Generalized Reconstruction of *n*-D NMR Spectra from Multiple Projections: Application to the 5-D HACACONH Spectrum of Protein G B1 Domain." *J. Am. Chem. Soc.*, **126**, 1000-1001 (2004).

3. Brian E. Coggins, Xuechen Li, Amanda L. McClerren, Ole Hindsgaul, Christian R. H. Raetz, and Pei Zhou. "Structure of the LpxC Deacetylase with a Bound Substrate-Analog Inhibitor." *Nat. Struct. Biol.*, **10**, 645-651 (2003).

2. Brian E. Coggins, Xuechen Li, Ole Hindsgaul, Christian R. H. Raetz, and Pei Zhou. "Assignment of the ^{1}H, ^{13}C and ^{15}N Resonances of the LpxC Deacetylase from *Aquifex aeolicus* in Complex with the Substrate-Analog Inhibitor TU-514." *J. Biomol. NMR*, **28**, 201-202 (2004).

1. Brian E. Coggins and Pei Zhou. "PACES: Protein Sequential Assignment by Computer-Assisted Exhaustive Search." *J. Biomol. NMR*, **26**, 93-111 (2003).

Authors indicated with asterisks contributed equally.

INVITED LECTURES:

9. Keystone Symposium: Frontiers of NMR in Biology XII, Snowbird, UT, January 13-17, 2013.

8. National Institutes of Health, Bethesda, MD, February 24, 2012.

7. Southeastern Magnetic Resonance Conference, University of Florida, Gainesville, FL, November 3 to 5, 2006.

6. Southeastern Magnetic Resonance Conference, Emory University, Atlanta, GA, November 11 to 13, 2005.

5. Triangle-Area NMR Discussion Group, Research Triangle Park, NC, June 29, 2005.

4. North Carolina Sectional Meeting of the American Chemical Society, Raleigh, NC, April 30, 2005.

3. 45th Experimental NMR Conference, Asilomar Conference Grounds, Pacific Grove, CA, April 18 to 23, 2004.

2. North Carolina Sectional Meeting of the American Chemical Society, Durham, NC, April 17, 2004.

1. Triangle-Area NMR Discussion Group, Research Triangle Park, NC, July 9, 2003.

POSTER PRESENTATIONS:

11. International Conference on Magnetic Resonance in Biological Systems, Lyon, France, August 19-24, 2012.

10. 51st Experimental NMR Conference, Daytona Beach, FL, April 18 to 23, 2010.

9. Keystone Symposium: Frontiers of NMR in Biology X, Sante Fe, NM, February 15 to 20, 2009.

8. 49th Experimental NMR Conference, Asilomar Conference Grounds, Pacific Grove, CA, March 9 to 14, 2008.

7. 48th Experimental NMR Conference, Daytona Beach, FL, April 22 to 27, 2007.

6. 47th Experimental NMR Conference, Asilomar Conference Grounds, Pacific Grove, CA, April 23 to 28, 2006.

5. 46th Experimental NMR Conference, Providence, RI, April 10 to 15, 2005.

4. Keystone Symposium: Frontiers of NMR in Molecular Biology IX, Banff, Alberta, Canada, January 29 to February 4, 2005.

3. 17th European Experimental NMR Conference, Lille, France, September 6 to 11, 2004.

2. FASEB Experimental Biology 2003, San Diego, CA, April 11 to 15, 2003.

1. 44th Experimental NMR Conference, Savannah, GA, March 30 to April 4, 2003.

CONFERENCE POSTER AWARDS AND SCHOLARSHIPS:

Keystone Symposium Scholarship (2009)
Student Travel Stipend, 48th Experimental NMR Conference (2007)
Southeastern Magnetic Resonance Conference Travel Award (2006)
Southeastern Magnetic Resonance Conference Poster Award (2005)
Keystone Symposium Scholarship (2005)
Student Travel Stipend, 45th Experimental NMR Conference (2004)
Student Travel Stipend, 44th Experimental NMR Conference (2003)

PUBLICALLY AVAILABLE SOFTWARE:

DFT3D and DFT4D – released Fall of 2009. Programs for the processing of sparsely sampled 3-D and 4-D NMR data using the DFT or FFT, with implementations of the CLEAN algorithm for suppressing sampling artifacts.

PR-CALC – initial release June 2006, final release October 2006. A program for the reconstruction of NMR spectra from projection data. In use in more than 60 research groups worldwide.

NMRDATA Library – initial release June 2006, final release October 2006. A C++ library facilitating efficient access to large NMR datasets in a variety of file formats. Directly used in several research groups for NMR software development, and indirectly used by more than 60 research groups as part of other software.

PACES – *Protein Sequential Assignment by Computer-Assisted Exhaustive Search*, released June 2003. A program for the automated assignment of protein backbone NMR

resonances, using a novel exhaustive search deterministic algorithm. In use in more than 75 research groups worldwide.

PROTEIN STRUCTURES:

1XXE (supercedes 1NZT): "RDC refined solution structure of the AaLpxC/TU-514 complex," 2004 (with A.L. McClerren, L. Jiang, X. Li, J. Rudolph, O. Hindsgaul, C.R.H. Raetz, and P. Zhou). NMR solution structure of the LpxC deacetylase from *Aquifex aeolicus* with a bound substrate-analog inhibitor.

SERVICE TO THE SCIENTIFIC COMMUNITY:

Reviewer, 2010-present, *Journal of Biomolecular NMR*

UNIVERSITY SERVICE:

Demonstration Organist, 2006-present, Duke University Chapel
Member, 1999-2009, Duke University Chapel Choir
Member, 2004, Duke University Humanitarian Service Award Committee
Chair, 2004-2005, Duke Structural Biology and Biophysics Seminar Series
Member, 2002-2003, University Judicial Board, Duke University
Member (2001-2003) and co-chairman (2002-2003), Undergraduate Judicial Board, Duke University

SERVICE IN THE DURHAM/CHAPEL HILL COMMUNITY:

Volunteer, 2009-present, Interfaith Council for Social Service (IFC) Community Kitchen, Chapel Hill, NC

LANGUAGES AND OTHER SKILLS:

Fluent in German
Limited proficiency in French and Latin
Computer programming languages/environments: C++, C, Python, Mathematica

PERSONAL INTERESTS:

Classical piano, organ, harpsichord, choral singing (bass/baritone)
History, especially early modern Europe and colonial American

History and philosophy of science, and Western intellectual history
Gourmet cooking
Hiking, backpacking
Photography