

**Brandy S. Russell**  
***Curriculum vitae***

800 West College Avenue  
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brussell@gustavus.edu

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**Education**

University of Rochester (Rochester, NY)

Ph.D. chemistry, February 2003

M.S. in chemistry, May 2000

Alfred University (Alfred, NY)

B.A. in chemistry, *cum laude*, with honors in chemistry, May 1998

**Experience**

September 2005 – present

**Assistant Professor**, Gustavus Adolphus College (Saint Peter, MN)

Primary courses: Principles of Chemistry, Inorganic Chemistry II

Research: Folding and metal binding specificity in myohemerythrin and metalloprotein II

January 2003 – July 2005

**HHMI Postdoctoral Fellow**, University of Illinois at Urbana-Champaign (Urbana, IL)

Advisor: Yi Lu

Course: The Chemistry and Biology of Everyday Life

Research: Engineering a non-heme iron binding site in myoglobin; copper binding and reactivity of an engineered heme-copper site in myoglobin; strengthening the link between science majors' interests and science curricula

September 1998 – December 2002

**Graduate Research and Teaching Assistant**, University of Rochester (Rochester, NY)

Advisor: Kara L. Bren

Thesis title: *NMR Investigations of Ferricytochrome c Folding and Dynamics*

Courses: Inorganic Chemistry, Chemical Instrumentation, Molecular Spectroscopy

Research: Heme ligation in partially and fully unfolded horse cytochrome *c*; conformational dynamics of thermophilic and mesophilic bacterial cytochromes *c*

January 1997 – May 1998

**Undergraduate Research Assistant**, Alfred University (Alfred, NY)

Advisor: Johanna L. Crane

Research: Synthesis of modified  $\beta$ -diketonates for use in metal oxide production

**Publications**

Natasha Yeung, Ying-Wu Lin, Yi-Gui Gao, Xuan Zhao, Brandy S. Russell, Lanyu Lei, Kyle D. Miner, Howard Robinson & Yi Lu "Rational design of a structural and functional nitric oxide reductase" *Nature* **2009**, 462(7276), 1079.

- Lauren Denofrio, Brandy S. Russell, David Lopatto, and Yi Lu “Linking student interests to science curricula” *Science* **2007**, 318(5858), 1872-1873.
- Lea V. Michel, Tao Ye, Sarah E.J. Bowman, Benjamin D. Levin, Megan A. Hahn, Brandy S. Russell, Sean J. Elliott, Kara L. Bren “Heme attachment motif mobility tunes cytochrome *c* redox potential” *Biochemistry* **2007**, 46(42), 11753-11760.
- Xin Wen, Kirti M. Patel, Brandy S. Russell, and Kara L. Bren “Effects of heme pocket structure and mobility on cytochrome *c* stability” *Biochemistry* **2007**, 46(7), 2537-2544.
- Xuan Zhao, Natasha Yeung, Brandy S. Russell, Dewain K. Garner, and Yi Lu “Catalytic reduction of NO to N<sub>2</sub>O by a designed heme copper center in myoglobin: implications for the role of metal ions” *J. Amer. Chem. Soc.* **2006**, 128(21), 6766-6767.
- Linghao Zhong, Xin Wen, Terry M. Rabinowitz, Brandy S. Russell, Elizabeth F. Karan, and Kara L. Bren “Heme axial methionine fluxionality in *Hydrogenobacter thermophilus* cytochrome *c*<sub>552</sub>.” *Proc. Natl. Acad. Sci., USA* **2004**, 101, 8637-8642.
- Brandy S. Russell, Linghao Zhong, Maria Giulia Bigotti, Francesca Cutruzzolà, and Kara L. Bren “Backbone dynamics and hydrogen exchange of *Pseudomonas aeruginosa* ferricytochrome *c*<sub>551</sub>.” *J. Biol. Inorg. Chem.* **2003**, 8, 156-166.
- Brandy S. Russell and Kara L. Bren “Denaturant dependence of equilibrium unfolding intermediates and denatured state structure of horse ferricytochrome *c*.” *J. Biol. Inorg. Chem.* **2002**, 7, 909-916.
- Elizabeth F. Karan, Brandy S. Russell, and Kara L. Bren “Characterization of *Hydrogenobacter thermophilus* cytochromes *c*<sub>552</sub> expressed in the cytoplasm and periplasm of *Escherichia coli*.” *J. Biol. Inorg. Chem.* **2002**, 7, 260-272.
- Brandy S. Russell, Rory Melenkivitz, and Kara L. Bren. “NMR investigation of ferricytochrome *c* unfolding: Detection of an unfolding intermediate and residual structure in the denatured state.” *Proc. Natl. Acad. Sci., USA* **2000**, 97, 8312-8317.

## Conference presentations

- ACS National meeting, San Francisco, CA; March 2010 (contributed talk) “Role of metal type and oxidation state in myohemerythrin folding and metal site assembly” Brandy Russell, Alysha Dicke, and Veronica Taylor. (student Alysha Dicke also presented a poster at this conference)
- Biennial Conference on Chemical Education, Bloomington, IN; July 2008 (contributed talk) “Linking student interests to science curricula.” Brandy Russell, Lauren Denofrio, and Yi Lu.
- ACS National meeting, New Orleans, LA; April 2008 (students Leigh Clanton and Veronica Taylor presented a poster at this conference)

First Year Undergraduate Chemistry Education International Conference, Urbana-Champaign, IL; May 2005 (poster presentation) “A new integrated approach to undergraduate chemistry education.” Brandy S. Russell and Yi Lu.

ACS Northeast Regional Meeting, Rochester, NY; November 2004 (invited talk) “Metal binding and reactivity of myoglobin variants with an engineered heme-copper site.” Brandy S. Russell, Natasha Yeung, Xuan Zhao, and Yi Lu.

International Conference on Magnetic Resonance in Biological Systems, Toronto, Ontario (Canada); August 2002 (poster presentation) “NMR studies of non-native states of cytochrome *c*.” Brandy S. Russell, Rory Melenkivitz, and Kara L. Bren.

Gordon Graduate Research Seminar: Bioinorganic Chemistry, Ventura, CA; January 2002 (poster presentation) “NMR studies of non-native states of paramagnetic cytochrome *c*.” Brandy S. Russell, Rory Melenkivitz, and Kara L. Bren.

Upstate New York NMR Symposium, Rochester, NY; October 2001 (poster presentation) “NMR studies of non-native states of cytochrome *c*.” Brandy S. Russell, Rory Melenkivitz, and Kara L. Bren.

Upstate New York NMR Symposium, Ithaca, NY; October 2000 (poster presentation) “Hydrogen exchange kinetics of bacterial cytochromes *c*.” Brandy S. Russell, Megan A. Hahn, Elizabeth F. Karan, Linghao Zhong, Kara L. Bren, Maria Giulia Bigotti, and Maurizio Brunori.

45<sup>th</sup> annual Undergraduate Research Symposium, Rochester, NY; April 2000 (invited workshop leader) “Two-dimensional NMR techniques.”

Inorganic Biochemistry Summer Workshop, Athens, GA; July 2000 (poster presentation) “Elucidating heme ligation in denatured and partially denatured cytochrome *c*.” Brandy S. Russell, Rory Melenkivitz, and Kara L. Bren.

Great Lakes College Chemistry Conference, East Lansing, MI; March 1998 (poster presentation) “Synthesis of modified  $\beta$ -diketonates.” Brandy S. Russell, Angelic B. Hoover, and Johanna L. Crane.

*Undergraduate coauthors indicated by underlining*

### **Invited seminars**

“Metal binding specificity in proteins: Investigations of highly homologous iron- and cadmium-binding proteins” Alfred University, Alfred, NY; November, 2011.

“Molecular origami: Stories of protein folding” Faculty Shop Talk, Gustavus Adolphus College, April 2009.

“Folding, metal site assembly, and metal binding specificity in metalloproteins.” Hope College, Holland, MI; January 2009.

“Best of both worlds? The first year on the tenure track at a research-active, primarily undergraduate liberal arts college.” University of Illinois at Urbana-Champaign, Urbana-Champaign, IL; September 2006.

“Protein dynamics and stability: conformational flexibility of a highly stable cytochrome *c* from a thermophilic bacterium.” Alfred University, Alfred, NY; October 2001.

## Professional Development and Society Memberships

Council on Undergraduate Research (joined 2008)

- Institute for Institutionalizing Undergraduate Research (Jan 2011)
- Published vignette in CUR Quarterly on Peer Mentoring in Undergraduate Research (Winter 2010, vol. 31 iss. 2, p 40)
- Initiating and Sustaining Undergraduate Research Programs Workshop (Jan 2010)
- Proposal Writing Institute (July 2008)

American Association for the Advancement of Science (joined 2007)

Society of Biological Inorganic Chemistry (joined 2007)

Bush Workshop at Gustavus: The Student as Scholar (June 2007)

Scholarship of Teaching and Learning programming and conversations at Gustavus (since 2006)

International Center for First-Year Undergraduate Chemistry Education (joined 2005)

Reviewer, *European Journal of Biochemistry*, *Journal of Chemical Education*

Howard Hughes Medical Institute Professors' meeting (Nov 2003)

American Chemical Society, division of inorganic chemistry (joined 2000)

## Scholarships & Honors

Jan 2003 – July 2005	Howard Hughes Medical Institute Postdoctoral Fellow
Sept 2002 – Dec 2002	Agnes M. & George Messersmith Fellow
Sept 2001 – Aug 2002	Elon Huntington Hooker Graduate Fellow
Sept 2000 – Aug 2001	Samuel Allen & Ellen Frances Lattimore Graduate Fellow
May 1999	W. D. Walters Teaching Award
Sept 1998 – Dec 2002	Sherman Clarke Fellow

## Courses taught at Gustavus Adolphus College

CHE-107 Principles of chemistry (Fall 2005 – 2011)

CHE-141 Organic chemistry I laboratory (Spring 2006 – 2008, 2011)

CHE-255 Biochemistry laboratory (Fall 2008)  
CHE-344 Special topics: NMR spectroscopy (Spring 2009)  
CHE-385 Inorganic chemistry II (Spring 2006 – 2011, lab offered since 2008)  
NDL-129/CHE-128 Chemistry of cooking (January 2007, 2011)  
CHE-291/391 Independent study (frequently)

## **Service activities**

### **College-wide**

Faculty development committee (Sept 2011 – present)  
Grade appeals board (Sept 2011 – present)  
Celebration of creative inquiry committee (June 2007 – present, chair through 2011)  
Kendall Center Faculty Associate for Undergraduate Research (Sept 2008 – Aug 2011)  
Undergraduate research working group, chair (Sept 2010 – May 2011)  
Mentoring for student success program (Sept 2007 – May 2008)  
Curriculum committee, divisional representative (Sept 2007 – May 2008)  
Mini-courses for admissions visit days (2007, 2008)  
Course approval subcommittee, divisional representative (Sept 2006 – May 2007)  
Summer registration (2006, 2007, 2008, 2010, 2011)  
Scholarship days interviewer (2006, 2007, 2010)  
Diversity Center Chat 'n' Chew host (2006)  
Coordinated undergraduate research panels for admissions visit days and scholarship days

### **Division and department**

HHMI Undergraduate research director (Sept 2008 – Aug 2011)  
Student research working group in biology and chemistry, co-chair (Summer 2007)  
Chemistry seminar coordinator (Sept 2006 – May 2007)  
Biochemistry & molecular biology steering committee (Feb 2006 – present)  
Chemistry department search committees: 3 tenure track faculty, laboratory instructor,  
several visiting faculty, administrative assistant  
Library liaison for the chemistry department (Sept 2005 – May 2006)

### **Community**

Speaker at Career Day for high school students (March 2006, 2007)

## Research students at Gustavus Adolphus College

- 2011 Sarah Lucht (chemistry '13)
- 2010 Kyle Boe (biology, chemistry '11) applying for employment and dental schools
- 2010 Zainab Olabisi Jaji (biochemistry '13)
- 2009 – 2010 Mandy Halfen (biology, chemistry '11) employed at Apex International and applying for biochemistry and chemistry graduate school
- 2008 – 2010 Alysha Dicke (biochemistry, chemistry '10) employed at R&D Systems in Minneapolis and applying to MD/PhD programs
- 2009 Jessica Moertel (biochemistry, biology '10)
- 2009 Laura Secor (biochemistry '10)
- 2009 Tony Yang (biochemistry '10)
- 2008 – 2009 Jordan Makela (biochemistry '09) medical school at South Dakota State University
- 2008 – 2009 Laura Groskreutz (ACS chemistry) transferred
- 2007 – 2009 Veronica Taylor (biochemistry, chemistry '09) graduate school at University of Michigan
- 2007 – 2008 Leigh Clanton (biochemistry, biology, chemistry '09) medical school at University Colorado Science Center School of Medicine
- 2007 Ross Elenkiwich (art studio '10)
- 2006 – 2007 Meghan Hogdal (chemistry '07) chemistry graduate school at Northwestern University
- 2006 Zeb Zacharias (biology '09) biology graduate school at Minnesota State University, Mankato
- 2006 Kristin Kaplan (chemistry '07) pharmacist at Walgreens after pharmacy school at University of Minnesota – Twin Cities
- 2006 Pamela Nguyen (chemistry '07) dental school at AT Still University – Arizona

## Presentations by research students

Amanda Halfen and Brandy Russell, “Cloning of Myohemerythrin and Metalloprotein II from *Nereis diversicolor* and Metal Binding in *Phascolopsis Gouldii*,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; September 2010. (talk)

Zainab Jaji and Brandy Russell, “Unfolding studies of Myohemerythrin (Myohr) from *Phascolopsis gouldii*,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; September 2010. (talk)

Alysha Dicke and Brandy Russell, “Dependence of myohemerythrin folding on iron oxidation state,” Sigma Xi Research Symposium and the Celebration of Creative Inquiry, Gustavus Adolphus College, St. Peter, MN; April 2010. (poster)

Alysha Dicke and Brandy Russell, “Dependence of myohemerythrin folding on iron oxidation state,” American Chemical Society National meeting, San Francisco, CA; March 2010. (poster)

Alysha Dicke and Brandy Russell, “Unfolding studies of myohemerythrin from *Phascolopsis gouldii*,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; September 2009. (talk)

Jordan Makela and Brandy Russell, “Phenotypic characterization of myohemerythrin-expressing *Escherichia coli*,” Sigma Xi Research Symposium, Gustavus Adolphus College, St. Peter, MN; May 2009. (talk)

Jessica Moertel and Brandy Russell, “Cloning and expression of myohemerythrin and metalloprotein II,” Sigma Xi Research Symposium, Gustavus Adolphus College, St. Peter, MN; May 2009. (talk)

Veronica Taylor and Brandy Russell, “Solvent signal suppression using WEFT and decoupler pulse sequences,” Sigma Xi Research Symposium, Gustavus Adolphus College, St. Peter, MN; May 2009. (talk)

Laura Groskreutz and Brandy Russell, “Incorporation of Myohemerythrin Protein with Iron(II) in the Presence of Small Molecules,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; September 2008. (talk)

Jordan Makela and Brandy Russell, “Optimizing the Purification of Myohemerythrin and Metalloprotein II from *Nereis diversicolor*,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; September 2008. (talk)

Veronica Taylor, Leigh Clanton, and Brandy Russell, “Metal binding specificity in a pair of homologous proteins that bind iron and cadmium,” American Chemical Society National meeting, New Orleans, LA; April 2008. (poster)

Veronica Taylor and Brandy S. Russell, “Metal binding specificity in myohemerythrin and metalloprotein II,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; September 2007. (talk)

Meghan L. Hogdal and Brandy S. Russell, “Purification and reconstitution studies in a myohemerythrin mutant,” Gustavus Adolphus College Chemistry Seminar, St. Peter, MN; November 2006. (talk)

Meghan L. Hogdal and Brandy S. Russell, “Purification and reconstitution studies in a myohemerythrin mutant,” Gustavus Adolphus College Summer Research Symposium, St. Peter, MN; August 2006. (talk)

*Undergraduate presenters and coauthors indicated by underlining*

## Grant proposals, funded

Course, Curriculum, and Laboratory Improvement Grant (NSF), May 2010. Building instrumental competence to support student independence in the laboratory. (\$200,000, funded)

- PI: Scott Bur
- Co-PI: Brandy Russell

Sabbatical Leave Proposal (Gustavus Adolphus College), March 2010. (sabbatical leave year 2012-2013, funded pending tenure)

Presidential Student/Faculty Collaboration Grant (Gustavus Adolphus College), February 2009. Metal-dependent protein folding. (\$6,450, funded)

- Coauthors: Alysha Dicke ('10) and Brandy Russell

Undergraduate Summer Research Program (Merck/AAAS), November 2007. (\$60,000, funded)

- PIs: Brenda Kelly and Brandy Russell
- Co-PIs: Scott Bur, Joel Carlin, Jeffrey Dahlseid, Eric Elias, John Lammert, Amanda Nienow, Brian O'Brien

Greater Gustavus Fund (Gustavus Adolphus College), April 2007. (\$4,000, funded)

Research, Scholarship, and Creativity Grant (Gustavus Adolphus College), March 2006. Myohemerythrin folding and metal site assembly. (\$2,200, funded)

## Grant proposals, not funded

Course, Curriculum, and Laboratory Improvement Grant (NSF), January 2010. The iScience Model: Strengthening the Link Between Science Courses and Students' Interests and Individuality. (\$597,112, subcontract for \$41,494, not funded)

- Lead PI: Yi Lu (University of Illinois at Urbana-Champaign)
- Subcontracts: Brandy Russell and Xiaotang Wang (Florida International University)

Howard Hughes Medical Institute Professor Grant (HHMI), November 2009. The iScience Model: Strengthening the Link Between Science Courses and Students' Interests and Individuality. (\$1,000,000, subcontract for \$18,971, not funded)

- Lead PI: Yi Lu (University of Illinois at Urbana-Champaign)
- Subcontracts: Brandy Russell and Xiaotang Wang (Florida International University)

Research at Undergraduate Institutions Grant (NSF), November 2008. The role of metal type and oxidation state in myohemerythrin folding and metal site assembly. (\$158,383, not funded)

Course, Curriculum, and Laboratory Improvement Grant (NSF), May 2008. Using renewable energy modules across the curriculum to enhance student learning. (\$140,941, not funded)

- PI: Charles Niederriter
- Co-PIs: Colleen Jacks, Jeffrey Jeremiason, Brenda Kelly, and Brandy Russell



Cottrell College Scholars Award (Research Corporation), May 2007. Metal site assembly and specificity in a pair of highly homologous proteins that bind different metal atoms. (\$44,368 match, not funded)

Course, Curriculum, and Laboratory Improvement Grant (NSF), May 2007. Integrating renewable energy laboratory exercises across the science curriculum. (\$149,998, not funded)

- PI: Charles Niederriter
- Co-PIs: Jeffrey Jeremiason, Brenda Kelly, Brandy Russell, and Jonathan Smith

Research, Scholarship, and Creativity Grant (Gustavus Adolphus College), March 2007. Cadmium (and other metal) coordination in myohemerythrin and metalloprotein II. (\$2,200, not funded)

Undergraduate Summer Research Program (Merck/AAAS), November 2006. (\$60,000, not funded)

- PIs: Brenda Kelly and Brandy Russell
- Co-PIs: Margaret Bloch Qazi, Scott Bur, Jeffrey Dahlseid, Colleen Jacks, John Lammert, Brian O'Brien, Jonathan Smith

Presidential Student/Faculty Collaboration Grant (Gustavus Adolphus College), February 2006. Myohemerythrin folding and metal site assembly. (\$7,500, not funded)

- Coauthors: Meghan Hogdal ('07) and Brandy Russell

Cottrell College Scholars Award (Research Corporation), November 2005. Metalloprotein folding and metal site assembly. (\$36,168, not funded)

Faculty Start-Up Award (Camille and Henry Dreyfus Foundation), May 2005. Metal site assembly in proteins. (\$30,000, not funded)

## **Student grant proposals**

Sarah Lucht: Sigma Xi Grant (Gustavus Adolphus College), September 2011. Cadmium binding to *Nereis diversicolor* metalloprotein II. (\$500, pending)

Alysha Dicke: Sigma Xi Grant (Gustavus Adolphus College), September 2009. Unfolding studies of myohemerythrin. (\$450, funded)

Jessica Moertel: Sigma Xi Grant (Gustavus Adolphus College), January 2009. Cloning and expression of myohemerythrin and metalloprotein II. (\$440, funded)

*Undergraduate collaborators indicated by underlining*