

Kara L. Bren

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EDUCATION:

Carleton College, Northfield, Minnesota (1987 – 1991) B.A., Chemistry (1991)

Research: NMR investigation of dynamics of carbohydrates
Research Advisor: Prof. Lynn Buffington

California Institute of Technology, Pasadena, California (1991 – 1995) Ph.D., Chemistry (1996)

Thesis: Structurally Engineered Cytochromes *c* with Novel Ligand-Binding Properties
Research Advisor: Harry B. Gray

University of Florence, Florence, Italy (4/94 – 8/94; 4/95 – 5/95), visiting student

Research: NMR solution structures of paramagnetic heme proteins
Research Advisor: Ivano Bertini

PROFESSIONAL EXPERIENCE:

Chair, Department of Chemistry	2022 – 2025
Richard S. Eisenberg Professor in Chemistry , University of Rochester	2021 – present
Professor of Chemistry , University of Rochester	2008 – present
Associate Professor of Chemistry , University of Rochester	2003 – 2008
Assistant Professor of Chemistry , University of Rochester	1997 – 2003
Member of UR Biophysics Structural and Computational Biology Program	1998 – present
NIH Postdoctoral Fellow , University of California at Davis, Gerd LaMar lab	1996 – 1997

AWARDS AND HONORS:

Inaugural holder of the Richard S. Eisenberg Professorship in Chemistry	2021
Featured in Women at the Forefront of Energy Research, <i>ACS Energy Letters</i>	2020
Distinguished Women in Chemistry Lecturer, Princeton University	2019
Distinguished Lecturer, City University of Hong Kong	2019
Elected Fellow, American Association for the Advancement of Science	2018
KAIST Chemistry Distinguished Lectureship Award	2018
Humphrey Lecturer, University of Vermont	2017
Kavli Fellow, National Academy of Sciences	2017
Edward Peck Curtis Award for Excellence in Undergraduate Teaching	2017
Visiting Lecturer, Chemistry Promotion Center, Taiwan	2016
Visiting Scholar, Kaohsiung Medical University, Taiwan	2016
Guest Professor of Biochemistry, Lund University, Sweden	2014
Salzberg Lecturer, City College of New York	2014
Guest Professor of Biochemistry, Lund University, Sweden	2014
American Chemical Society PROGRESS/Dreyfus Lectureship Award	2006
Alfred P. Sloan Research Fellow	2003 – 2005
Paul Saltman Memorial Lecturer	2004
National Research Service Award (NIH Post-doctoral Fellow)	1996 – 1997
Eastman/Kodak Graduate Fellow	1992 – 1995
Special Institute Fellow, Caltech	1991 – 1992
Nominated to Phi Beta Kappa	1991
Nominated to Sigma Xi	1991
Franz Exner Award for Excellence in Chemistry	1991
Technology Policy Studies Fellow (Carleton College; sponsored by Sloan Foundation)	1990

LEADERSHIP IN SCIENTIFIC FIELD:

International Advisory Board Member, Bulletin of the Korean Chemical Society	2020 – 2023
External Advisory Board Member, University of Kansas NIH CBI T32	2020 – present
External Advisory Board Member, Cornell University NIH CBI T32	2020 – present
Panel Leader, Solar Fuels Roundtable, Office of Science, Department of Energy	2019 – 2020
Program Director, UR Chemistry-Biology Interface Training Program (NIH T32)	2017 – present
Associate Editor, <i>Journal of the American Chemical Society</i>	2014 – present
Member, Editorial Advisory Board, <i>Comments on Inorganic Chemistry</i>	2014 – present
Member, Editorial Advisory Board, <i>Accounts of Chemical Research</i>	2011 – 2020
Guest Editor, <i>Proceedings of the National Academy of Sciences</i>	2016, 2017
Member, DOE Panel on Nitrogen Activation	2016
Council Member, Society for Biological Inorganic Chemistry	2014 – 2018
ACS National Award Selection Committee	2012 – 2015
Alternate Councilor, Division of Inorganic Chemistry, American Chemical Society	2013 – 2015
Member, Editorial Advisory Board, <i>Journal of Inorganic Biochemistry</i>	2012 – 2016
Chair, ACS Division of Inorganic Chemistry, Bioinorganic Subdivision	2010
Director, University of Rochester Biological Chemistry Cluster	2010 – present
Chair-elect, ACS Division of Inorganic Chemistry, Bioinorganic Subdivision	2009
Member, Editorial Advisory Board, <i>Inorganic Chemistry</i>	2009 – 2012
Thesis Opponent, University of Bergen, Norway	2008
Member, Editorial Advisory Board, <i>Journal of Biological Inorganic Chemistry</i>	2007 – 2011
Guest Editor, <i>Inorganic Chemistry Forum on Metalloprotein Folding</i>	2004
Invited Expert Analyst, <i>ChemTracts Inorganic Chemistry</i>	2000 – 2009

REVIEWING AND ADVISORY ACTIVITIES (SELECTED):

Jury Member, Merck KGaA Future Insight Prize	2019 – present
Member, Advisory Board, Merck KGaA	2017 – 2018
Examination Board, PhD Thesis, University of Naples (Italy)	2017
Reviewer, DOE EFRC Programs	2016, 2018
Panel Reviewer, NSF-CHE (five times)	2008 – 2019
Member, NIH Fellowship Panel	2015, 2019
Member, External Committee, Johns Hopkins Chemistry Department Evaluation	2015
Member, NSF CAREER Panel, NSF-CHE	2015
Member, NIH Macromolecular Structure and Function A Study Section (MSFA)	2005 – 2008
Member, DOE Review Panel on Basic Research for Hydrogen Fuel Initiative	2005
Ad hoc Member, NIH Physical Biochemistry Special Emphasis Panel	2004
Ad hoc Member, NIH Metallobiochemistry Study Section (twice)	2003
Ad hoc Member, NIH Biochemistry Study Section	2003
Ad hoc Member, NIH Biochemistry Special Emphasis Panel	2003

LEADERSHIP ACTIVITIES IN SCIENTIFIC MEETINGS (SELECTED):

Chair-Elect, Chair; Metals in Biology Gordon Research Conference	2020, 2022
Panelist, U.S. – German Workshop on Artificial Photosynthesis	2021
Plenary Lecturer, eBIC	2021
Discussion Leader, Metallocofactors Gordon Research Conference	2022
Discussion Leader, Inorganic Reaction Mechanisms Gordon Research Conference	2019
Organizer, Power Hour, Metals in Biology Gordon Research Conference	2018
Organizer, Symposium on Solar Fuels, ACS National Meeting, Boston	2018
Discussion Leader, Bioinorganic Chemistry Graduate Research Seminar	2018
Organizer, Power Hour on Women in Science, Metals in Biology Gordon Conference	2018
Discussion Leader, Metals in Biology Gordon Research Conference	2015, 2017
Session Organizer and Chair, Tetrapyrroles Gordon Research Conference	2016
Organizer, Symposium on Heme Modification, Transport and Regulation, ACS National Meeting, Anaheim, CA	2011

LEADERSHIP ACTIVITIES IN SCIENTIFIC MEETINGS (SELECTED, Continued):

Co-organizer, Tenth Annual Upstate New York NMR Symposium, Rochester, NY	2008
Session Moderator, Protein Structure and Folding, Graduate Research Seminar on Bioinorganic Chemistry, Ventura, CA	2006
Moderator, Bioinorganic Oral Session, National Meeting of the ACS, Anaheim, CA	2004
Session Organizer and Moderator, Bioinorganic Chemistry Oral Session, Northeast Regional Meeting of the ACS, Rochester, NY	2004
Session Moderator, Residual Structures in Unfolded Proteins, Gordon Research Conference on Protein Folding Dynamics, Ventura, CA	2002
Co-organizer, Third Annual Upstate New York NMR Symposium, Rochester, NY	2001

PROFESSIONAL AFFILIATIONS:

American Association for the Advancement of Science
 American Chemical Society (Inorganic, Biological, and Physical subdivisions)
 National Academy of Sciences Kavli Fellow
 New York Academy of Science
 Phi Beta Kappa
 Sigma Xi
 Iota Sigma Pi
 Society for Biological Inorganic Chemistry

PROFESSIONAL DEVELOPMENT ACTIVITIES (selected):

Career and Occupational Mentoring for the Professional Advancement of Science Students (COMPASS) workshop	2021
Center for Improvement of Mentored Experiences in Research (CIMER) workshop	2021
Cottrell Scholars Collaborative Academic Leadership Training workshop	2020

CURRENT FUNDING:

"Training Grant in the Chemistry-Biology Interface," National Institutes of Health

"2021 Metals in Biology Gordon Research Conference and Bioinorganic Chemistry Gordon Research Seminar," Department of Energy

"SISGR: Modular Nanoscale and Biomimetic Assemblies for Photocatalytic Hydrogen Generation," Department of Energy

"CAS: Metallopeptide Artificial Enzymes," National Science Foundation

PUBLICATIONS:

For full list see: <https://scholar.google.com/citations?user=eqCI1VQAAAAJ&hl=en>

PATENTS:

1. Method and System for Purifying And Quantitating Proteins Using Heme Fusion Tags, PCT Patent Application No. PCT/US11/22982, United States Patent # 8,815,533, 8 August 2014.
2. Methods for Producing Hydrogen Using Nanoparticle-Catalyst Mixtures, United States Patent #10,047,443, 14 August 2018
3. Integrated Nanotechnological and Biological Systems for Efficient Solar Hydrogen Production, US Provisional Patent Application Number 61/932,430, filed with the U.S. Patent and Trademark Receiving Office on January 28, 2014.

PLENARY, KEYNOTE, AWARD, AND NAMED LECTURES:

- 2007:** ACS PROGRESS/Dreyfus Lecture, Department of Chemistry, Purdue University
2010: Keynote, American Chemical Society Rochester Section Meeting, Geneva, NY
2014: Salzberg Lecture, City College of New York, New York, NY
2015: Keynote, Northeast Regional Meeting of the American Chemical Society, Ithaca, NY
 Keynote, IUPAC Congress, Busan, Korea
 Keynote, Texas Woman's University
2016: Plenary, The Girona Seminar on Transition Metal Reactivity by Design, Girona, Spain
 Keynote, Catalysis & Fine Chemicals, Taipei, Taiwan
2017: Keynote, Symposium for Advanced Biological Inorganic Chemistry, Kolkata, India
 Humphrey Lecturer, University of Vermont
 Keynote, DGIST Global Innovation Festival, Korea
2018: Plenary, Dalton 2018, Coventry, UK
 KAIST Lectureship Award, Daejeon, Korea
2019: Distinguished Lecturer, City University of Hong Kong
 Keynote, ICBIC 19
 Plenary, Latin American Symposium on Coordination and Organometallic Chemistry, Cartagena, Columbia
 Distinguished Women in Chemistry Lecturer, Princeton University
2021: Plenary Lecturer, eBIC

COURSES TAUGHT:

Advanced Inorganic Chemistry I (graduate level) (CHM 411)
 Advanced Inorganic Chemistry II (graduate level; physical inorganic chemistry) (CHM 412)
 Biochemistry (Lecturer on NMR of biomolecules) (IND 408)
 Biochemistry (Undergraduate and graduate level) (CHM 250/450)
 Bioinorganic Chemistry (graduate level) (CHM 414)
 Chemical Concepts, Systems, and Practices II (CHM 132)
 Group Theory (CHM 415)
 Inorganic Chemistry (undergraduate level) (CHM 211)
 Methods in Structural Biology (Lecturer on NMR of proteins) (CHM 402/BPH 411)
 Nuclear Magnetic Resonance Spectroscopy (CHM 422)
 Physical Methods in Inorganic Chemistry (CHM 424)
 Principles of Chemistry (lab) (CHM 105L)

SERVICE TO THE CHEMISTRY COMMUNITY:

Teacher at Penn State Bioinorganic Workshop on Paramagnetic NMR: 2016, 2018
 Organizer of Power Hour at Metals in Biology Gordon Research Conference, 2018
 Keynote Speaker at Women in Chemistry Event, KAIST, Daejeon, Korea, 2018
 Award Committee,
 Selection Committee for the Editor-in-Chief of *Journal of Biological Inorganic Chemistry*
 Speaker at ACS On Campus: "Art of the Graphical Abstract," ACS Forum, Seoul, Korea, 2019
 Speaker at ACS On Campus: "Ten Tips for Scientific Presentation," University of Rochester,
 2020
 Moderator, URSTEMrecharge, 2021

POSTDOCTORAL RESEARCHERS TRAINED:

1. Matthew Liptak (9/08 – 7/11), NIH Postdoc, *Project:* Effects of heme conformation on electronic structure. *Current Position:* Assistant Professor, Department of Chemistry, University of Vermont
2. Andrea Lee (10/08 – 7/11), *Project:* Single-molecule folding studies of cytochrome *c* (Advised jointly by Todd Krauss). *Current Position:* Research Associate (Group Leader), School of Medicine, University of Vermont

3. Anni Siitonen (2/11 – 2/12), *Project*: Photophysics and charge transfer in carbon nanotube-porphyrin conjugates. *Next Position*: Senior Scientist, Polestar Technologies; *Current Position*: Patent Agent, Morgan Lewis.
4. Sanela Lampa-Pastrik (11/13 – 6/14) *Project*: Biological electron donors for solar hydrogen generation, *Current Position*: Assistant Professor, Nazareth College
5. Peter Lamberg (3/15 – 8/16) *Project*: Biological electron donors for solar hydrogen generation. *Current Position*: Postdoc, Rochester Institute of Technology
6. Banu Kandemir (2/19 – 8/20) *Project*: Nitrite coordination chemistry, systems for photocatalytic hydrogen production. *Current Position*: Senior Scientist, Ortho Clinical Diagnostics.

STUDENTS TRAINED:

Bren group PhD graduates:

1. Elizabeth Foreza Karan (1/98 – 2/02), Graduate student, inorganic chemistry (Ph.D. '02). *Thesis*: Expression and Spectroscopic Characterization of *Hydrogenobacter thermophilus* Cytochrome *c*₅₅₂. *Next and Current Position*: High School Teacher, Ridgewood, NJ
2. Brandy S. Russell (1/99 – 12/02), Graduate student, inorganic chemistry (Ph.D. '03). *Thesis*: NMR Investigations of Ferricytochrome *c* Folding and Dynamics. *Next Position*: Postdoctoral Fellow, University of Illinois Urbana Champaign. *Current Position*: Associate Professor, Department of Chemistry, Gustavus Adolphus College, St. Peter, MN
3. Kirti M. Patel (1/99 – 7/03), Graduate student, inorganic chemistry (Ph.D. '03). *Thesis*: Expression and Characterization of Thermophilic and Mesophilic Cytochromes *c*. *Next and Current Position*: High school teacher, CT
4. Linghao Zhong (1/99 – 8/03), Graduate student, biophysical chemistry (Ph.D. '03). *Thesis*: Investigation of Dynamics and Electronic Structures of Bacterial Cytochromes *c*. *Next Position*: Postdoctoral Fellow, Cornell University. *Current Position*: Associate Professor of Chemistry, Penn State Mont Alto
5. Xin Wen, Ph.D. (1/01 – 12/04), Graduate student, biophysical chemistry (Ph.D. '04). *Thesis*: Heme Axial Ligand Fluxion in Cytochromes *c*: Characterization, Causes, and Consequences. *Next Position*: Postdoctoral Fellow, Johns Hopkins University. *Current Position*: Professor of Chemistry, California State University Los Angeles
6. Jason A. Kellogg (6/99 – 3/05), Graduate student, inorganic chemistry (Ph.D. '05). *Thesis*: Expression of Horse Cytochrome *c* Variants for Analysis of Non-native Conformations. *Next Position*: Scientist, Dade Behring. *Current Position*: Senior Manager R&D – Assay Development, Siemens Healthcare Diagnostics
7. Lea Vacca Michel (6/03 – 1/07), Graduate student, biophysics and structural biology (Ph.D. '07). *Thesis*: Dynamics-function Relationships in Cytochromes *c*. *Next Position*: Postdoctoral Fellow, Department of Molecular Biology and Genetics, Cornell University. *Current Position*: Associate Professor of Chemistry, Rochester Institute of Technology
8. Ravinder Kaur (6/03 – 2/07), Graduate student, inorganic chemistry (Ph.D. '07). *Thesis*: Characterization and Conformational Changes of *Nitrosomonas europaea* Cytochrome *c*₅₅₂. *Next Position*: Postdoctoral Fellow, Department of Microbiology and Immunology, University of Rochester. *Current Position*: Research Scientist II, Center for Infectious Disease and Immunology, Research Institute, Rochester General Hospital, and Adjunct Faculty, Rochester Institute of Technology, Rochester, NY
9. Amy A. Ensign Kovach (1/05 – 11/09), Graduate student, biophysical chemistry (Ph.D. '09; Joint student with Todd Krauss). *Thesis*: Studies of Horse Heart Cytochrome *c* Folding. *Next Position*: Assistant Professor of Chemistry, Roberts Wesleyan College, Rochester, NY. *Current Position*: Associate Professor of Chemistry, Roberts Wesleyan College
10. Sarah E. J. Bowman (1/06 – 8/10), Graduate student, inorganic chemistry (PhD '10). *Thesis*: Development of Spectroscopy Probes of Second-Sphere Interactions in Cytochromes *c*. *Next Position*: Postdoctoral Research Fellow, MIT. *Current Position*: Associate Research Scientist and Head, High-throughput Crystallization Center, Hauptman-Woodward Medical Research Institute, Buffalo, NY.
11. Mehmet Can (6/07 – 2/12), Graduate student, inorganic chemistry (PhD, '12). *Thesis*: Factors Affecting the Heme Electronic Structure of Proteins with Heme *c*. *Next Position*: Postdoctoral

- Fellow, University of Michigan. *Next Position*: Senior Research Scientist, Elixir Pharmaceuticals R&D, Ankara, Turkey. *Current Position*: Assistant Professor, Ankara Medipol University, School of Pharmacy.
12. Wesley B. Asher (7/07 – 8/07; 12/07 – 4/12), Graduate student, biophysical chemistry (PhD '12). *Thesis*: Engineering Native and Artificial Heme *c* Containing Proteins for Biochemical Applications and Studies of Protein Folding. *Next Position*: Postdoctoral Fellow, Columbia University. *Current Position*: Associate Adjunct Research Scientist, Columbia University
 13. Jesse G. Kleingardner (12/07 – 8/13), Graduate student, biological chemistry. *Thesis*: Biological Role and Applications of Covalent Heme Attachment to Polypeptides. *Next Position*: Postdoc, Ithaca College. *Current Position*: Assistant Professor, Messiah College, PA
 14. Lenore Kubie (12/09 – 10/14), Graduate student, physical chemistry. *Thesis*: Metallopeptides and Metallocytochromes *c* with Single-Walled Carbon Nanotube Conjugates for Alternative Energy Applications. *Next Position*: Postdoctoral researcher, University of Wyoming, *Current Position*: Data Engineer, Citrine Informatics.
 15. Banu Kandemir (12/11 – 9/16) PhD student, inorganic chemistry. *Thesis*: Electrocatalytic Hydrogen Evolution from Water by Biosynthetic Cobalt Catalysts. *Next Positions*: Postdoctoral Researcher, University of North Carolina at Chapel Hill; Assistant Professor, Middle East Technical University, Cyprus. *Current Position*: Senior Scientist, Ortho Clinical Diagnostics, Rochester, NY
 16. Yixing Guo (7/14 – 4/18) PhD student, inorganic chemistry, *Thesis*: Cobalt Metallopeptide for Multi-Proton, Multi-Electron Reactions. *Next Position*: Senior Engineer, Process Engineering, Globalfoundries, Inc. *Current Position*: Engineer, Intel Corporation.
 17. Saikat Chakraborty (12/13 – 12/19) PhD student, inorganic chemistry, *Project*: Photocatalytic hydrogen generation using biomolecular catalysts. *Next Positions*: Visiting Assistant Professor of Chemistry, Utica College, Utica, NY; Visiting Assistant Professor, Oxford College of Emory University, Oxford, GA. *Current Position*: Associate Professor, Paul Smiths College, Paul Smiths, NY.
 18. Jennifer M. Le (12/15 – 7/20) PhD student, biological chemistry, *Thesis*: Catalytic Hydrogen Evolution by a Synthetic Cobalt Mini-Enzyme. *Next and Current Position*: Practical Teacher of Bioanalysis, Department of Pharmacy in the Faculty of Science, University of Groningen, Netherlands.
 19. Jose L. Alvarez Hernandez (12/16 – 9/21) PhD student, inorganic chemistry, *Thesis*: Bioinspired Cobalt Catalysts for Electrochemical Hydrogen Evolution and CO₂ Reduction in Water. *Next and Current Position*: Postdoc, Hazari lab, Yale.