

## JOAN BLANCHETTE BRODERICK

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D.O.B. 02/12/1965

### EDUCATION

|  |      |
|--|------|
| Massachusetts Institute of Technology, Postdoctoral Fellow           | 1993 |
| Northwestern University, Ph.D., Inorganic Chemistry                  | 1992 |
| Washington State University, B.S., Chemistry, <i>summa cum laude</i> | 1987 |

### POSITIONS HELD

|              |   |  |
|--------------|---|--|
| 2018-present | Head, Dept. of Chemistry & Biochemistry     | <i>Montana State University</i>              |
| 2005-present | Professor of Chemistry and Biochemistry     | <i>Montana State University</i>              |
| 2004-2005    | Professor of Chemistry                      | <i>Michigan State University</i>             |
| 2002-2004    | Associate Professor of Chemistry            | <i>Michigan State University</i>             |
| 1998-2002    | Assistant Professor of Chemistry            | <i>Michigan State University</i>             |
| 1993-1998    | Assistant Professor of Chemistry            | <i>Amherst College</i>                       |
| 1992-1993    | American Cancer Society Postdoctoral Fellow | <i>Massachusetts Institute of Technology</i> |
| 1987-1992    | NSF Predoctoral Fellow                      | <i>Northwestern University</i>               |

### HONORS AND AWARDS

*Ian Scott Medal, Texas A&M Section of the American Chemical Society, 2023*  
*National Academy of Sciences, Elected Member, 2022*  
*American Academy of Arts and Sciences, Elected Member, 2022*  
*Melvin Calvin Lecture, Chemistry Dept, UC-Berkeley, 2021*  
*AAAS Fellow, 2020*  
*Alfred Bader Award in Bioinorganic or Bioorganic Chemistry, American Chemical Society, 2019*  
*Illinois Distinguished Lecturer in Inorganic Chemistry, University of Illinois, 2019*  
*Montana State University Extraordinary Ordinary Woman, 2018*  
*James and Mary Ross Award for Excellence, 2017*  
*Women in Science Distinguished Professor, 2013-2015*  
*Charles and Norah L. Wiley Award for Meritorious Research and Creativity, 2007*  
*Saltman Lecturer, Metals in Biology Gordon Research Conference, 2002*  
*Trustee-Faculty Fellowship, Amherst College*  
*American Cancer Society Postdoctoral Fellowship*  
*National Science Foundation Predoctoral Fellowship*  
*First Place, Meeting-in-Miniature Seminar Competition, Northwestern U. Chemistry Department*  
*Distinguished Achievement Award, Washington State University College of Arts and Sciences*  
*Director's Award, Washington State University Honors Program*  
*S. Towne Stephenson Scholar, Washington State University Honors Program*  
*First Place, Research Paper Competition, Sigma Xi Research Society*  
*Research Paper Award, Washington State University Association of Research Professors*  
*Phi Beta Kappa Scholarship*  
*Harry H. Batey Scholarship, Washington State University Chemistry Department*  
*Washington State Scholar*  
*National Merit Scholar*

**TEACHING ACTIVITIES**

*Amherst College, Michigan State University, and Montana State University:*

Inorganic Chemistry at the undergraduate and graduate level, Biochemistry at the undergraduate and graduate level, General Chemistry, Honors General Chemistry, Bioinorganic Chemistry

**PROFESSIONAL SERVICE**

*National and International*

Service to Professional Societies and Governmental Organizations

DOE, Basic Energy Sciences Advisory Committee, 2019 – present

ASBMB Council Member, 2019 – present

Conference Organization

Gordon Research Conference on Metals in Biology, Vice-Chair (2013), Chair (2014)

ICBIC International Organizing Committee, Member 2003 – present

Gordon Research Conference on Protein-Derived Cofactors, Radicals, and Quinones,  
Vice-Chair (2006), Chair (2008)

Gordon Research Conferences, GRC Council Member-at-Large, 2008 - 2011

Twelfth International Conference on Bioinorganic Chemistry (ICBIC-12), Co-Chair, 2005

ICBIC-12 Program Committee Chair, 2005

Service to Federal Funding Agencies

NIH MIRA Review Panel, March 2022

DOE Distinguished Scientist Review Panel, July 2021, June 2022

NIH MIRA Review Panel, November 2020

DOE-BES Committee of Visitors, September 2020, Panel Chair

NIH Special Emphasis Panel, October 2016

DOE-BES Committee of Visitors, May 2014

NIH Conference Grants Review Panel, April 2014

NSF MCB-CLP Panel, March 2014

NIH ZRG1 BCMB-D (02) panel, February 2014

NSF Mail Reviewer, February 2014

NSF CAREER Panel, 2013

NIH Mail Reviewer, 2001 – present

NIH Ad-hoc reviewer, MSFE, October 2009

NIH Special Emphasis Panel ZRG1 OBT-D (90) S, Chair, July 2009

NIH Special Emphasis Panel ZRG1 BCMB-B (02) M, Chair, Feb 2009

NIH Special Emphasis Panel BMB-B 90, Chair, July-August 2008

NIH MSFA Study Section, Member and Chair, 01/05 – 10/06

NIH Metallobiochemistry Study Section, Member, 06/02 – 10/04 (Chair, 10/03-10/04)

NIH Physical Biochemistry Study Section, Ad hoc member, 06/00

NIH Biochemistry Study Section, Ad hoc member, 10/99

NIH Metallobiochemistry Study Section, outside reviewer, 06/99

American Chemical Society

ACS-Division of Inorganic Chemistry, Chair of Bioinorganic Subdivision, 2006

ACS-Division of Inorganic Chemistry, Alternate Councilor, 2002-2005

Editorial Service

Associate Editor, *Journal of Biological Chemistry*, 2023 – present

Editorial Advisory Board, *Journal of Biological Chemistry*, 2017 – present

Editorial Advisory Board, *J. Inorg. Biochem.*, 2009-present

Editorial Advisory Board, *Inorganic Chemistry*, 2005-2007

Editorial Advisory Board, *J. Biol. Inorg. Chem.* 2003-2005

Editor, *Current Opinion in Chemical Biology*, 2003 Bioinorganic Issue

Service in Review of Proposals, Manuscripts, and Books

*J. Am. Chem. Soc., Angew. Chemie., Biochemistry, Proc. Natl. Acad. Sci. U.S.A., Nature, Nature Chemical Biology, J. Biol. Inorg. Chem., Arch. Bioch. Biophys., National Science Foundation, Petroleum Research Fund, Research Corporation, Cambridge University Press*

*Department and University Service (at Montana State University, various times from 2005 - present)*

Chemistry Long-Range Planning Committee, Molecular Biosciences Program Advisory Board, Chemistry Department Promotion and Tenure Committee, Physics Department Promotion and Tenure Committee, Chemistry Department Undergraduate Curriculum Committee, Chemistry Department Search Committees, College of Letters and Sciences Promotion and Tenure Committee, Chemistry Department Educational Policies Committee, Chemistry & Biochemistry Department External Review Committee, Chemistry & Biochemistry Department Seminar Committee, Women in Science Distinguished Professor Selection Committee, Chair, Chemistry & Biochemistry Department Graduate Program Committee

*Department and University Service (at Michigan State University, various times from 1998 - 2005)*

Recruiting Seminars, Graduate Admissions Committee, Advisory Committee, Space Committee, Inorganic Search Committee, Departmental Administrator Search Committee, Babcock Memorial Symposium Organizing Committee, Organic Search Committee, Graduate Advising Committee, Equipment Committee, Library Committee, Colloquium Committee, Scientific Misconduct Inquiry Panel, Condensed Matter Physics Faculty Search Committee, Analytical Faculty Search Committee

**RESEARCH FUNDING**ACTIVE

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|--|--|
| R35 GM131889 (years 1-5) (P.I.)<br>National Institutes of Health<br>Title: <i>Radical SAM Enzymes: Molecular Mechanisms of Radical Initiation</i><br>Replaces GM54608 above.                       | 6/1/2019 – 5/31/2024<br>\$1,777,340/5 years  |
| DE-FG02-10ER16194 (years 10 – 12) (P.I.)<br>Department of Energy – BES<br>Title: <i>Role of HydF in Hydrogenase Maturation</i>   | 9/15/2022 – 9/14/2025<br>\$720,000/3 years   |
| DOE - EPSCoR (years 1 – 4 + NCE) (role: - Co-P.I.)<br>Department of Energy – BES<br>Title: <i>Probing novel pathways of iron sulfide acquisition and trafficking in model biocatalytic systems</i> | 8/15/2019 – 8/14/2024<br>\$2,000,000/2 years |

EXPIRED

|   |   |
|---|---|
| R01 GM54608 (funded for 21 years, replaced by R35 in 2019) (P.I.)<br>National Institutes of Health<br>Title: <i>Iron-Sulfur Clusters in Biological Radical Generation</i>                 | 7/1/2015 – 5/31/2019<br>\$1,200,000/4 years           |
| NSF 1609557 (co-P.I.; E. Shepard, P.I.)<br>National Science Foundation<br>Title: <i>Synthetic Biomimetic Design of Radical S-Adenosylmethionine Maquettes from Experiments and Theory</i> | 9/1/2016 – 8/31/2020<br>\$456,114/3 years             |
| CHE-0947085 (co-P.I.)<br>National Science Foundation<br>Title: <i>Instrumentation for Complementary Inorganic, Organometallic, and Bioinorganic Spectroscopy</i>                          | 3/1/2010 – 1/31/2014<br>\$240,965/entire grant period |
| 05 NAI05-19 (co-P.I. w/ John Peters and others)<br>NASA Astrobiology Institute  | 8/1/2007-7/31/2012<br>\$6,100,000/entire grant period |

Title: *Astrobiology Biogeocatalysis Research Center*

R01 GM67804 (P.I.) 5/1/2003 – 4/30/2008  
National Institutes of Health \$1,057,571/entire grant period  
Title: *Generation and Repair of an Unusual UV Photoproduct*

DE-FG02-04ER63923 (co-P.I. w/ Jim Tiedje and others) 10/1/2004-9/30/2008  
Department of Energy \$1,108,994/entire grant period  
Title: *Exploring the Genome and Proteome of Desulfitobacterium hafniense DCB-2 for its Protein Complexes Involved in Metal Reduction and Dehalogenation*

S10 RR 15880 (co-P.I.,) 4/1/2001 – 3/31/2003  
National Institutes of Health \$500,000/entire grant period  
Title: *94 GHz/9 GHz Continuous-wave and Pulsed EPR Spectrometer*

F32 GM20315 9/1/2000 – 5/31/2002  
National Institutes of Health Postdoctoral Fellowship \$70,000/entire grant period  
(for Dr. Jennifer Cheek in my lab)  
Title: *Mechanistic Studies of the Fe/S Enzyme SP Lyase*

R29 GM54608 (P.I.) 8/1/1997 – 7/31/2002  
National Institutes of Health FIRST Award \$492,340/entire grant period  
(replaced by R01 GM54608 above)  
Title: *Spectroscopic Studies of Pyruvate Formate-Lyase Activase*

R55 GM/OD 54608-01 (P.I.) 9/30/1996 – 7/31/1998  
National Institutes of Health Shannon Director's Award \$100,000/entire grant period  
(replaced by R29 GM54608 above)  
Title: *Spectroscopic Studies of Pyruvate Formate-Lyase Activase*

REF-PSD (P.I.) 8/1/1999 – 6/1/2000  
MSU Center for Protein Structure, Function, and Design \$10,000/entire grant period  
Title: *Characterization of the Metal Center of Spore Photoproduct Lyase, An Adenosylmethionine-dependent DNA Repair Enzyme*

CC4057 (P.I.) 12/1/1995 – 11/30/1997  
Research Corporation Cottrell College Science Award \$34,040/entire grant period  
Title: *Pyruvate formate-lyase activating enzyme: Spectroscopic studies of the metal center*

PRF 30673-GB3 (P.I.) 3/1/1996 – 8/31/1999  
Petroleum Research Fund of the American Chemical Society \$20,000/entire grant period  
Title: *Coordinately Unsaturated Fe(II) Complexes as Models for Oxygen Activation by Nonheme Iron Enzymes*

Amherst College 4/1/1994 – 9/30/1995  
Amherst College Faculty Research Award \$6,885/entire grant period  
Title: *Pyruvate Formate-Lyase Activating Enzyme: Mechanism of Generation of a Catalytically Essential Glycyl Radical*

## PUBLICATIONS

1. H.B. Krishnan, Joan T. Blanchette (Broderick), and T.W. Okita, "Wheat Invertases: Characterization of Cell Wall Bound and Soluble Forms," *Plant Physiol.* **1985**, 78, 241.
2. Joan T. Blanchette (Broderick) and R.D. Willett, "Magnetic and Structural Correlations in [(C<sub>5</sub>H<sub>5</sub>N)NH<sub>2</sub>]<sub>2</sub>Cu<sub>2</sub>Cl<sub>6</sub> and [(C<sub>5</sub>H<sub>5</sub>N)NH<sub>2</sub>]<sub>2</sub>Cu<sub>2</sub>Br<sub>6</sub>•H<sub>2</sub>O," *Inorg. Chem.* **1988**, 27, 843.

3. J.H. Cooley, E.J. Evain, R.D. Willett, and Joan T. Blanchette (Broderick), "Reactions of 1,1-Dimethyl-4-Substituted Semicarbazides with Phosgene," *J. Org. Chem.* **1989**, *54*, 1048.
4. Joan B. Broderick and T.V. O'Halloran, "Overproduction, Purification, and Characterization of Chlorocatechol Dioxygenase, A Nonheme-Iron Dioxygenase with Broad Substrate Tolerance," *Biochemistry*, **1991**, *30*, 7349-7358.
5. J. Stubbe, S. Booker, J. Broderick, S.S. Mao, M. Ator, G. Harris, G. Ashley, A.E. Linn, and G.X. Yu, "Ribonucleotide Reductases: Radical Enzymes with Suicidal Tendencies," *Nucleic Acids Symp. Ser.*, **1993**, *29*, 107.
6. S. Booker, J. Broderick, and J. Stubbe, "Ribonucleotide Reductases: Radical Enzymes with Suicidal Tendencies," *Biochem. Soc. Trans.*, **1993**, *21*, 727-730.
7. Joan B. Broderick, M.J. Natan, T.V. O'Halloran, and R.P. Van Duyne, "Surface-Enhanced Resonance Raman Spectroscopic Studies of an Active Non-Heme Iron Enzyme Adsorbed at a Ag Surface," *Biochemistry*, **1993**, *32*, 13771-13776.
8. S. Booker, S. Licht, Joan Broderick, and J. Stubbe, "Coenzyme B<sub>12</sub>-dependent Ribonucleotide Reductase: Evidence for the Participation of Five Cysteine Residues in Ribonucleotide Reduction," *Biochemistry*, **1994**, *33*, 12676-12685.
9. Joan B. Broderick, R.A. Duderstadt, D.C. Fernandez, Kristi Wojtuszewski, Timothy F. Henshaw, and Michael K. Johnson, "Pyruvate Formate-Lyase Activating Enzyme is an Iron-Sulfur Protein," *J. Am. Chem. Soc.*, **1997**, *31*, 7396-7397.
10. Joan B. Broderick, "Catechol Dioxygenases," *Essays Biochem.*, **1999**, *34*, 173-189.
11. J. B. Broderick, Coenzymes and Cofactors, In: Encyclopedia of Life Sciences, Nature Publishing Group: London, [www.els.net](http://www.els.net) (2000).
12. J.B. Broderick, T.F. Henshaw, J. Cheek, K. Wojtuszewski, S.R. Smith, M.R. Trojan, R.M. McGhan, A. Kopf, M. Kibbey, and W.E. Broderick "Pyruvate formate-lyase activating enzyme: Strictly anaerobic isolation yields active enzyme containing a [3Fe-4S]<sup>+</sup> cluster," *Biochem. Biophys. Res. Commun.*, **2000**, *269*, 451-456.
13. T.F. Henshaw, J. Cheek, and J.B. Broderick, "The [4Fe-4S]<sup>1+</sup> of Pyruvate Formate-Lyase Activating Enzyme Generates the Glycyl Radical on Pyruvate Formate-Lyase: EPR-Detected Single Turnover," *J. Am. Chem. Soc.* **2000**, *122*, 8331-8332.
14. J. R. Miller, R.W. Busby, S.W. Jordan, J. Cheek, T.F. Henshaw, Gary A. Ashley, J.B. Broderick, John E. Cronan, Jr., and M.A. Marletta, "Escherichia coli LipA is a Lipoyl Synthase: In vitro Biosynthesis of Lipoylated Pyruvate Dehydrogenase Complex from Octanoyl-Acyl Carrier Protein," *Biochemistry*, **2000**, *39*, 15166-15178.
15. C. Krebs, T.F. Henshaw, J. Cheek, B.-H. Huynh, and J.B. Broderick, "Conversion of 3Fe-4S to 4Fe-4S Clusters in Native Pyruvate Formate-Lyase Activating Enzyme: Mössbauer Characterization and Implications for Mechanism," *J. Am. Chem. Soc.*, **2000** *122*, 12497-12506.
16. J. Cheek and J.B. Broderick, "Adenosylmethionine-Dependent Iron-Sulfur Enzymes: Versatile Clusters in a Radical New Role," *J. Biol. Inorg. Chem.*, **2001** *6*, 209-226.
17. C. Walsby, W. Hong, W.E. Broderick, D. Ortillo, J.B. Broderick, and B.M. Hoffman, "Electron-Nuclear Double Resonance Spectroscopic Evidence that S-Adenosylmethionine Binds in Contact With the Catalytically Active [4Fe-4S]<sup>+</sup> Cluster of Pyruvate Formate-Lyase Activating Enzyme," *J. Am. Chem. Soc.* **2002**, *124*, 3143-3151.
18. Carsten Krebs, William E. Broderick, Timothy F. Henshaw, Joan B. Broderick, and Boi Hanh Huynh, "Coordination of Adenosylmethionine to a Unique Iron Site of the [4Fe-4S] of Pyruvate Formate-Lyase Activating Enzyme: A Mössbauer Spectroscopic Study," *J. Am. Chem. Soc.* **2002**, *124*, 912-913.
19. J. Cheek and J. B. Broderick, "Direct H atom Abstraction from Spore Photoproduct C-6 Initiates DNA Repair in the Reaction Catalyzed by Spore Photoproduct Lyase: Evidence for a Reversibly Generated Adenosyl Radical Intermediate," *J. Am. Chem. Soc.* **2002**, *124*, 2860-2861.
20. Charles J. Walsby, Danilo Ortillo, William E. Broderick, Joan B. Broderick, Brian M. Hoffman, "An Anchoring Role for FeS Clusters: Chelation of the Amino Acid Moiety of S-Adenosylmethionine to the Unique Iron Site of the [4Fe-4S] Cluster of Pyruvate Formate-Lyase Activating Enzyme," *J. Am. Chem. Soc.* **2002**, *124*, 11270-11271.
21. Joan B. Broderick, "Iron-Sulfur Clusters in Enzyme Catalysis." Invited contribution to *Comprehensive Coordination Chemistry II: From Biology to Nanotechnology, Volume 8*, L. Que and W. B. Tolman, Volume Eds., J. McCleverty and T. Meyer, Eds., Elsevier Science, **2003**.

22. Joan B. Broderick, Charles Walsby, William E. Broderick, Carsten Krebs, Wei Hong, Danilo Ortillo, Jennifer Cheek, Vincent Huynh, and Brian M. Hoffman, "Paramagnetic Resonance in Mechanistic Studies of Fe-S/Radical Enzymes," in *ACS Symposium Series 858: Paramagnetic Resonance of Metallobiomolecules*, J. Telser, Ed., American Chemical Society: Washington, DC, **2003**.
23. Michele M. Cospers, Nathaniel J. Cospers, Wei Hong, William E. Broderick, Jacob E. Shokes, Joan B. Broderick, Michael K. Johnson, and Robert A. Scott, "The Direct Interaction between the FeS Cluster and SAM is not a Universal Feature of Radical SAM Enzymes," *Protein Science* **2003**, *12*, 1573-1577.
24. Jeffrey M. Buis and Joan B. Broderick, "Pyruvate Formate-Lyase Activating Enzyme: Elucidation of a Novel Mechanism for Glycyl Radical Formation," *Arch. Bioch. Biophys.* **2005**, *433(1)*, 288-296.
25. Charles Walsby, Danilo Ortillo, Jian Yang, Mbako R. Nnyepi, William E. Broderick, Brian M. Hoffman, and Joan B. Broderick, "Spectroscopic Approaches to Elucidating Novel Iron-Sulfur Chemistry in the "Radical SAM" Protein Superfamily," *Inorg. Chem.* **2005**, *44*, 727-741.
26. Joan B. Broderick, "Fe/S Clusters in Radical Generation." Invited contribution to *Biological Inorganic Chemistry: Structure and Reactivity*, I. Bertini, H.B. Gray, and J.S. Valentine, Eds., University Science Books, **2006**.
27. J.M. Buis, J. Cheek, E. Kalliri, J.B. Broderick "Characterization of an Active Spore Photoproduct Lyase, an Enzyme in the Radical SAM Superfamily," *J. Biol. Chem.* **2006**, *381(36)*, 25994 - 26003.
28. Mbako R. Nnyepi, Yi Peng, and Joan B. Broderick, "On the Activation and Inactivation of Pyruvate Formate-Lyase: Role of AdhE and Small Molecules," *Arch. Bioch. Biophys.*, **2007**, *459*, 1 - 9.
29. Shawn E. McGlynn, Shane S. Ruebush, Anatoli Naumov, Lauren E. Nagy, Alexandra Dubini, Paul W. King, Joan B. Broderick, Matthew C. Posewitz, and John W. Peters "In vitro Activation of [FeFe] Hydrogenase: New Insights into Hydrogenase Maturation," *J. Biol. Inorg. Chem.*, **2007**, *12(4)*, 443 - 447.
30. Joan B. Broderick, "Assembling Iron-Sulfur Clusters in the Cytosol," *Nature Chemical Biology* **2007**, News & Views invited contribution, *3*, 243-244.
31. Shawn E. McGlynn, Eric M. Shepard, Mark A. Winslow, Anatoli V. Naumova, Kaitlin S. Duschene, Matthew C. Posewitz, William E. Broderick, Joan B. Broderick, and John W. Peters, "HydF as a Scaffold Protein in [FeFe] Hydrogenase H-cluster Biosynthesis," *FEBS Lett.* **2008**, *582*, 2183-2187.
32. Jessica Vey, Jian Yang, Meng Li, William E. Broderick, Joan B. Broderick, and Catherine Drennan, "Structural Basis for Glycyl Radical Formation by Pyruvate Formate-lyase Activating Enzyme," *PNAS* **2008**, *205(42)*, 16137-16141.
33. J. Martin Bollinger and Joan B. Broderick, "Frontiers in enzymatic C-H bond activation," *Curr. Op. Chem. Biol.* **2009**, *13*, 1-7.
34. Kaitlin S. Duschene, Susan E. Veneziano, Sunshine C. Silver, and Joan B. Broderick, "Control of radical chemistry in the AdoMet radical enzymes," *Curr. Op. Chem. Biol.* **2009**, *13*, 74-83.
35. David W. Mulder, Danilo O. Ortillo, David J. Gardenghi, Anatoli V. Naumov, Shane S. Ruebush, Robert K. Szilagy, Boi Hanh Huynh, Joan B. Broderick, and John W. Peters, "Activation of HydA<sup>AEFG</sup> Requires a preformed [4Fe-4S] Cluster," *Biochemistry* **2009**, *48(26)*, 6240-6248.
36. Tilak Chandra, Sunshine C. Silver, Egidijus Zilinskas, Eric M. Shepard, William E. Broderick, and Joan B. Broderick, "Spore Photoproduct Lyase Catalyzes Specific Repair of the 5R but not the 5S Spore Photoproduct," *J. Am. Chem. Soc.* **2009**, *131*, 2420-2421.
37. Shawn E. McGlynn, David W. Mulder, Eric M. Shepard, Joan B. Broderick, and John W. Peters, "Hydrogenase cluster biosynthesis: organometallic chemistry nature's way," *Dalton Trans.* **2009**, 4274-4285.
38. Jian Yang, Sunil G. Naik, Danilo O. Ortillo, Ricardo García-Serres, Meng Li, William E. Broderick, Boi Hanh Huynh, and Joan B. Broderick, "The Iron-Sulfur Cluster of Pyruvate Formate-Lyase Activating Enzyme in Whole Cells: Cluster Interconversion and a Valence-Localized [4Fe-4S]<sup>2+</sup> State," *Biochemistry* **2009**, *48(39)*, 9234-9241.
39. Tilak Chandra, William E. Broderick, and Joan B. Broderick, "Chemoselective Deprotection of Triethylsilyl Ethers," *Nucleotides, Nucleosides, and Nucleic Acids.* **2009**, *28*, 1016 - 1029.
40. Shawn E. McGlynn, Eric S. Boyd, Eric M. Shepard, Rachel Lange, Robin Gerlach, Joan B. Broderick, and John W. Peters, "Identification and characterization of a novel member of the radical AdoMet enzyme superfamily and implications for the biosynthesis of the Hmd hydrogenase active site cofactor," *J. Bacteriol.* **2010** *192*, 595-598.
41. Rebecca C. Driesener, Martin R. Challand, Shawn E. McGlynn, Eric M. Shepard, Eric S. Boyd, Joan B. Broderick, John W. Peters, and Peter L. Roach, "[FeFe]-Hydrogenase Cyanide Ligands Derived from S-Adenosylmethionine-Dependent Cleavage of Tyrosine," *Angew. Chem. Intl. Ed.* **2010**, *49*, 1687-1690.

42. Eric M. Shepard and Joan B. Broderick, "S-Adenosylmethionine and iron-sulfur clusters in biological radical reactions: The radical SAM superfamily." In *Comprehensive Natural Products Chemistry II Chemistry and Biology*; Mander, L., Lui, H.-W, Eds.; Elsevier: Oxford; Vol. 8, pp 625 - 661, **2010**.
43. Tilak Chandra, William E. Broderick, and Joan B. Broderick, "An Efficient Deprotection of N-trimethylsilylethoxymethyl (SEM) Groups from Dinucleosides and Dinucleotides," *Nucleotides, Nucleosides, and Nucleic Acids*. **2010** 29, 132-143.
44. Kaitlin S. Duschene and Joan B. Broderick, "The Antiviral Protein Viperin is a Radical SAM Enzyme," *FEBS Lett.* **2010** 584(6), 1263-1267.
45. David W. Mulder, Eric S. Boyd, Ranjana Sarma, Rachel K. Lange, James A. Endrizzi, Joan B. Broderick, and John W. Peters, "Stepwise [FeFe]-hydrogenase H-cluster assembly revealed in the structure of HydA<sup>AEFG</sup>," *Nature* **2010** 465, 248-251.
46. Eric M. Shepard, Shawn E. McGlynn, Alexandra L. Bueling, Celestine S. Grady-Smith, Simon J. George, Mark A. Winslow, Stephen P. Cramer, John W. Peters, and Joan B. Broderick, "Synthesis of the 2Fe subcluster of the [FeFe]-hydrogenase H cluster on the HydF scaffold," *Proc. Natl. Acad. Sci. U.S.A.* **2010**, 107(23), 10448-10453.
47. Joan B. Broderick, "A Radically Different Enzyme," *Nature* **2010** 465, 877-878.
48. Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Shourjo Ghose, William E. Broderick, and Joan B. Broderick, "Complete stereospecific repair of a synthetic dinucleoside spore photoproduct by spore photoproduct lyase," *J. Biol. Inorg. Chem.* **2010**, 15(6), 943-955.
49. Eric M. Shepard, Benjamin R. Duffus, Simon J. George, Shawn E. McGlynn, Martin R. Challand, Kevin D. Swanson, Peter L. Roach, Stephen P. Cramer, John W. Peters, and Joan B. Broderick, "[FeFe]-Hydrogenase Maturation: HydG-Catalyzed Synthesis of Carbon Monoxide," *J. Am. Chem. Soc.* **2010** 132(27), 9247-9249.
50. Yi Peng, Susan E. Veneziano, Gregory D. Gillispie, and Joan B. Broderick, "Pyruvate formate-lyase: Evidence for an open conformation favored in the presence of its activating enzyme," *J. Biol. Chem.* **2010** 285, 27224-27231.
51. Shawn E. McGlynn, Trevor E. Beard, Joan B. Broderick, and John W. Peters, "On the Potential for Radical Mediated Cyanide Production on the Early Earth," *J. Cosm.* **2010**, 10, 3315-3324.
52. Eric M. Shepard, Eric S. Boyd, Joan B. Broderick, and John W. Peters, "Biosynthesis of complex iron-sulfur enzymes," *Curr. Op. Chem. Biol.* **2011**, 319-327.
53. David W. Mulder, Eric M. Shepard, Jonathan E. Meuser, Neelambari Joshi, Paul W. King, Matthew C. Posewitz, Joan B. Broderick, and John W. Peters, "Insights into [FeFe]-Hydrogenase Structure, Mechanism, and Maturation," *Structure* **2011**, 19(8), 1038-1052.
54. Kevin D. Swanson, Benjamin R. Duffus, Trevor E. Beard, John W. Peters, Joan B. Broderick, "Cyanide and Carbon Monoxide Ligand Formation in Hydrogenase Biosynthesis," *Eur. J. Inorg. Chem.* **2011**, 935-947.
55. Abhishek Dey, Yi Peng, William E. Broderick, Britt Hedman, Keith O. Hodgson, Joan B. Broderick, Edward I. Solomon, "S K-edge XAS and DFT Calculations on SAM Dependent Pyruvate Formate-Lyase Activating Enzyme: Nature of Interaction between the Fe<sub>4</sub>S<sub>4</sub> Cluster and SAM and its Role in Reactivity," *J. Am. Chem. Soc.* **2011**, 133(46), 18656-18662.
56. Sang-Hoon Kim, Christina Harzman, John Davis, Rachel Hutcheson, Joan B. Broderick, Terence L. Marsh, James M. Tiedje, "Genome Sequence of *Desulfitobacterium hafniense* DCB-2, a potential bioremediator for dehalogenation and metal reduction," *BMC Microbiol.* **2012**, 12(21).
57. John W. Peters and Joan B. Broderick, "The Maturation of [FeFe]-Hydrogenases: A Paradigm for Complex Iron-Sulfur Cofactor Assembly and Insertion," *Annu. Rev. Biochem.* **2012**, 81, 429-450.
58. Benjamin R. Duffus, Trinity L. Hamilton, Eric M. Shepard, Eric S. Boyd, John W. Peters, and Joan B. Broderick, "Radical AdoMet enzymes in complex inorganic metallocluster biosynthesis," *BBA – Proteins and Proteomics*, **2012**, 1824(11), 1254-1263.
59. Kaitlin S. Duschene and Joan B. Broderick, "Viperin: A Radical Response to Viral Infection," *Biomol. Concepts*, **2012**, 3(3), 255-266.
60. Kevin D. Swanson, Danilo O. Ortillo, Joan B. Broderick, and John W. Peters, "[FeFe]-Hydrogenases," *Encyclopedia of Inorganic and Bioinorganic Chemistry*, **2012**, DOI: 10.1002/9781119951438.eibc2055.
61. Krista A. Shisler and Joan B. Broderick, "Emerging Themes in Radical SAM Enzymes," *Curr. Op. Struct. Biol.* **2012**, 22(6), 701-710.
62. Neelambari Joshi, Eric M. Shepard, Amanda S. Byer, Kevin D. Swanson, Joan B. Broderick, and John W. Peters, "Iron-sulfur cluster coordination in the [FeFe]-hydrogenase H Cluster biosynthetic factor HydF," *FEBS Lett.* **2012**, 586(22), 3939-3943.

63. Rachel U. Hutcheson and Joan B. Broderick, "Radical SAM Enzymes in Methylation and Methylthiolation," *Metallomics* **2012**, *4*, 1149-1154.
64. Adam V. Crain, Kaitlin S. Duschene, John W. Peters, and Joan B. Broderick, "Iron-Sulfur Cluster / SAM Enzymes and their Role in Hydrogenase Maturation," *Encyclopedia of Metalloproteins*, **2013**, 1034-1044.
65. Eric M. Shepard, Amanda S. Byer, Kevin D. Swanson, Eric S. Boyd, John W. Peters, and Joan B. Broderick, "[FeFe]-Hydrogenase Cofactor Assembly," in *Encyclopedia of Inorganic and Bioinorganic Chemistry*, edited by R.A. Scott. John Wiley & Sons, Ltd: Chichester, UK (**2013**). DOI: 10.1002/9781119951438.eibc2153.
66. Adam V. Crain and Joan B. Broderick, "Flavodoxin Cofactor Binding Induces Structural Changes that are Required for Protein-Protein Interactions with NADP<sup>+</sup> Oxidoreductase and Pyruvate Formate-Lyase Activating Enzyme," *BBA – Proteins and Proteomics*, **2013**, *1834* (12), 2512-2519.
67. David W. Mulder, Michael W. Ratzloff, Eric M. Shepard, Amanda S. Byer, Seth M. Noone, John W. Peters, Joan B. Broderick, and Paul W. King, "EPR and FTIR Analysis of the Mechanism of H<sub>2</sub> Activation by [FeFe]-Hydrogenase HydA1 from *Chlamydomonas reinhardtii*," *J. Am. Chem. Soc.* **2013**, *135*(18), 6921-6929.
68. Rebecca C. Driesener, Benjamin R. Duffus, Ian R. Bruzas, Eric M. Shepard, Natalie Coleman, Alexander P. G. Marrison, Enrico Salvadori, Christopher W. M. Kay, John W. Peters, Joan B. Broderick and Peter L. Roach, "Biochemical and kinetic characterization of radical AdoMet enzyme HydG," *Biochemistry*, **2013**, *52* (48), 8696-8707.
69. Adam V. Crain and Joan B. Broderick, "Pyruvate Formate-Lyase and its Activation by Pyruvate Formate-Lyase Activating Enzyme," *J. Biol. Chem.*, **2014**, *289*, 5723-5729.
70. Eric S. Boyd, Gerrit J. Schut, Eric M. Shepard, Joan B. Broderick, Michael W. W. Adams, and John W. Peters, "Origin and evolution of Fe-S proteins and enzymes," in *Iron-Sulfur Clusters in Chemistry and Biology*, edited by Tracey Roualt, de Gruyter, **2014**.
71. Krista A. Shisler and Joan B. Broderick, "Glycyl radical activating enzymes: Structure, mechanism, and substrate interactions," *Arch. Biochem. Biophys.*, **2014**, *546*, 64-71.
72. Jeremiah Betz, Eric M. Shepard, and Joan B. Broderick, "Radical SAM enzymes and their roles in complex cluster assembly," in *Metalloproteins: New insights from theory and experiment with implications for experiments and Challenges to the Theory*, edited by William Goddard and Art Cho, CRC Press, **2014**, *in press*.
73. Shourjo Ghose, Jonathan Hilmer, Brian Bothner, and Joan B. Broderick, "Solution Phase Dynamics of the DNA Repair Enzyme Spore Photoproduct Lyase as Probed by H/D Exchange," *FEBS Lett.* **2014**, *588*(17), 3023-3029.
74. Sunshine C. Silver, David J. Gardenghi, Eric M. Shepard, Sunil G. Naik, Boi Hanh Huynh, Robert K. Szilagyi, and Joan B. Broderick, "Combined Mössbauer and Multi-Edge X-Ray Absorption Spectroscopic Study of the Radical SAM Enzyme Spore Photoproduct Lyase," *J. Biol. Inorg. Chem.*, **2014** *19*, 465-483.
75. Joan B. Broderick, Benjamin R. Duffus, Kaitlin S. Duschene, and Eric M. Shepard, "Radical SAM Enzymes," *Chem. Rev.*, **2014**, *114*(8), 4229-4317 (*invited contribution to special issue on Bioinorganic Enzymology*).
76. Joan B. Broderick, Amanda S. Byer, Kaitlin S. Duschene, Benjamin R. Duffus, Jeremiah N. Betz, Eric M. Shepard, John W. Peters, "H-cluster Assembly During the Maturation of [FeFe]-Hydrogenase," *J. Biol. Inorg. Chem.* **2014**, *19*, 747-757.
77. Eric M. Shepard, Florence Mus, Jeremiah N. Betz, Amanda S. Byer, Benjamin R. Duffus, John W. Peters, and Joan B. Broderick, "[FeFe]-Hydrogenase Maturation," *Biochemistry* **2014**, *53*(25), 4090-4104.
78. Benjamin R. Duffus, Shourjo Ghose, John W. Peters, and Joan B. Broderick, "Reversible H Atom Abstraction by the Radical SAM Enzyme HydG," *J. Am. Chem. Soc.* **2014**, *136*(38), 13086-13089.
79. Amanda S. Byer, Eric M. Shepard, John W. Peters, and Joan B. Broderick, "Radical S-Adenosyl-L-methionine Chemistry in the Synthesis of Hydrogenase and Nitrogenase Metal Cofactors," *J. Biol. Chem.* **2015**, *290*(7), 3987-3994.
80. John W. Peters, Gerrit J. Schut, Eric S. Boyd, David W. Mulder, Eric M. Shepard, Joan B. Broderick, Paul W. King, and Michael W. W. Adams, "[FeFe]- and [NiFe]-hydrogenase diversity, mechanism, and maturation," *Biochim. Biophys. Acta – Mol. Cell Res.* **2015**, *1853*(6), 1350-1369.
81. Roland Lill, Joan B. Broderick, and Dennis R. Dean, "Special Issue on Iron-Sulfur Proteins: Structure, Function, Biogenesis, and Disease," *Biochim. Biophys. Acta – Mol. Cell Res.* **2015**, *1853*(6), 1251 – 1252.
82. Kevin D. Swanson, Michael W. Ratzloff, David W. Mulder, Jacob H. Artz, Shourjo Ghose, Andrew Hoffman, Spencer White, Oleg A. Zadvornyy, Joan B. Broderick, Brian Bothner, Paul W. King, and John W. Peters, *J. Am. Chem. Soc.* **2015**, *137*(5), 1809 – 1816.



83. Jeremiah N. Betz, Nicholas W. Boswell, Corey J. Fugate, Gemma L. Holliday, Eyal Akiva, Anna G. Scott, Patricia C. Babbitt, John W. Peters, Eric M. Shepard, and Joan B. Broderick, “[FeFe]-Hydrogenase Maturation: Insights into the role HydE plays in dithiomethylamine biosynthesis,” *Biochemistry* **2015**, *54*(9), 1807 – 1818.
84. Masaki Horitani, Amanda S. Byer, Krista A. Shisler, Tilak Chandra, Joan B. Broderick, Brian M. Hoffman, “Why Nature uses radical SAM enzymes so widely: ENDOR studies of lysine 2,3-aminomutase shows the 5'-dAdo• ‘Free Radical’ is never free,” *J. Am. Chem. Soc.* **2015**, *137*(22), 7111 - 7121.
85. Masaki Horitani, Krista Shisler, William E. Broderick, Rachel U. Hutcheson, Kaitlin S. Duschene, Amy R. Marts, Brian M. Hoffman, and Joan B. Broderick, “Radical SAM catalysis via an organometallic intermediate with an Fe-[5'-C]-deoxyadenosyl bond,” *Science* **2016**, *352*(6287), 822-825.
86. Eric M. Shepard, Amanda S. Byer, Jeremiah N. Betz, John W. Peters, and Joan B. Broderick, “A Redox Active [2Fe-2S] Cluster on the Hydrogenase Maturase HydF,” *Biochemistry* **2016**, *55*(25), 3514-3527.
87. Joan B. Broderick and James D. Moody, “Cutting choline with radical scissors,” *Cell Chem. Biol.* **2016**, *23*(10), 1173-1174.
88. Eric M. Shepard, Amanda S. Byer, Priyanka Aggarwal, Jeremiah N. Betz, Anna G. Scott, Krista A. Shisler, Robert J. Usselman, Gareth R. Eaton, Sandra S. Eaton, and Joan B. Broderick, “Electron spin relaxation and biochemical characterization of the hydrogenase maturase HydF: Insights into [2Fe-2S] and [4Fe-4S] cluster communication and hydrogenase activation,” *Biochemistry* **2017**, *56*, 3234-3247.
89. Krista A. Shisler, Rachel U. Hutcheson, Masaki Horitani, Kaitlin S. Duschene, Adam V. Crain, Amanda S. Byer, Eric M. Shepard, Ashley Rasmussen, Jian Yang, William E. Broderick, Jessica L. Vey, Catherine L. Drennan, Brian M. Hoffman, and Joan B. Broderick, “Monovalent cation activation of the radical SAM enzyme pyruvate formate-lyase activating enzyme,” *J. Am. Chem. Soc.* **2017**, *139*, 11803-11813.
90. Eric M. Shepard, Amanda S. Byer, and Joan B. Broderick, “Iron-Sulfur Cluster States of the Hydrogenase Maturase HydF,” *Biochemistry* **2017**, *56*, 4733-4734.
91. Eric S. Boyd, Gerrit J. Schut, Eric M. Shepard, Joan B. Broderick, Michael W. W. Adams, and John W. Peters, “Origin and evolution of Fe-S proteins and enzymes,” in *Iron-Sulfur Clusters in Chemistry and Biology*, edited by Tracey Roualt, de Gruyter, **2017**.
92. Amanda S. Byer, Elizabeth C. McDaniel, Stella Impano, William E. Broderick, and Joan B. Broderick, “Mechanistic Studies of Radical SAM Enzymes: Pyruvate Formate-Lyase Activating Enzyme and Lysine 2,3-Aminomutase Case Studies,” *Methods in Enzymology* **2018**, *606*, 269-318.
93. Anna G. Scott, Robert K. Szilagy, David W. Mulder, Michael W. Ratzloff, Amanda S. Byer,<sup>a</sup> Paul W. King, William E. Broderick, Eric M. Shepard, and Joan B. Broderick, Compositional and Structural Insights into the Nature of the H-Cluster Precursor on HydF,” *Dalton Trans.* **2018**, *47*, 9521-9535.
94. Amanda S. Byer, Hao Yang, Elizabeth C. McDaniel, Venkatesian Kathiresan, Stella Impano, Adrien Pagnier, Hope Watts, Carly Denler, Anna Vagstad, Jörn Piel, Kaitlin S. Duschene, Eric M. Shepard, Thomas P. Shields, Lincoln G. Scott, Edward A. Lilla, Kenichi Yokoyama, William E. Broderick, Brian M. Hoffman, and Joan B. Broderick, “Paradigm shift for radical SAM reactions: The organometallic intermediate  $\Omega$  is central to catalysis,” *J. Am. Chem. Soc.* **2018**, *140*(28), 8634-8638.
95. William E. Broderick, Brian M. Hoffman, and Joan B. Broderick, “Mechanism of radical initiation in the radical S-adenosyl-L-methionine Superfamily,” *Acc. Chem. Res.* **2018**, *51*(11), 2611-2619.
96. R. Hanscam, E.M. Shepard, J. B. Broderick, V. Copié, and R. K. Szilagy, “Secondary structure analysis of peptides with relevance to iron-sulfur cluster nesting,” *J. Comput. Chem.* **2019**, *40*, 515-526.
97. Amanda Galambas, Jaquelyn Miller, Morgan Jones, Elizabeth McDaniel, Molly Lukes, Hope Watts, Valérie Copié, Joan Broderick, Robert K. Szilagy, Eric M. Shepard, “Radical S-adenosylmethionine Maquette Chemistry: Cx3Cx2C Peptide Coordinated Redox Active [4Fe-4S] Clusters,” *J. Biol. Inorg. Chem.* **2019**, *24*, 793-807.
98. Amanda S. Byer, Eric M. Shepard, Michael W. Ratzloff, Jeremiah Betz, Paul W. King, William E. Broderick, and Joan B. Broderick, “H-Cluster Assembly Intermediates Built on HydF by the Radical SAM Enzymes HydE and HydG,” *J. Biol. Inorg. Chem.* **2019**, *24*, 783-792.
99. Hao Yang, Elizabeth C. McDaniel, Stella Impano, Amanda S. Byer, Richard J. Jodts, Kenichi Yokoyama, William E. Broderick, Joan B. Broderick, Brian M. Hoffman, “The Elusive 5'-Deoxyadenosyl Radical: Captured and Characterized by EPR and ENDOR Spectroscopies,” *J. Am. Chem. Soc.* **2019**, *141*(30), 12139-12146.
100. Hao Yang, Stella Impano, Eric M. Shepard, Christopher D. James, William E. Broderick, Joan B. Broderick, and Brian M. Hoffman, “Photoinduced Electron Transfer in a Radical SAM Enzyme Generates an S-Adenosylmethionine Derived Methyl Radical,” *J. Am. Chem. Soc.* **2019**, *141*(40), 16117-16124.

101. William E. Broderick and Joan B. Broderick, "Radical SAM Enzymes: Surprises along the Path to Understanding Mechanism," *J. Biol. Inorg. Chem.* **2019**, *24(6)*, 769-776.
102. Brigitta Németh, Moritz Senger, Holly J. Redman, Pierre Ceccaldi, Joan Broderick, Ann Magnuson, Sven T. Stripp, Michael Haumann, and Gustav Berggren, "[FeFe]-hydrogenase maturation: H-cluster assembly intermediates tracked by electron paramagnetic resonance, infrared, and X-ray absorption spectroscopy," *J. Biol. Inorg. Chem.* **2020**, *25*, 777-788.
103. Adrien Pagnier, Hao Yang, Richard Jodts, Christopher James, Eric M. Shepard, Stella Impano, William E. Broderick, Brian M. Hoffman, and Joan B. Broderick, "Radical SAM Enzyme Spore Photoproduct Lyase: Properties of the  $\Omega$  Organometallic Intermediate and Identification of Stable Protein Radicals Formed During Substrate-Free Turnover," *J. Am. Chem. Soc.* **2020**, *142(43)*, 18652-18660.
104. Stella Impano, Hao Yang, Richard J. Jodts, Adrien Pagnier, Ryan Swimley, Elizabeth C. McDaniel, Eric M. Shepard, William E. Broderick, Joan B. Broderick, and Brian M. Hoffman, "Active-Site Controlled, Jahn-Teller Enabled Regioselectivity in Reductive S-C Bond Cleavage of S-Adenosylmethionine in Radical SAM Enzymes," *J. Am. Chem. Soc.* **2021**, *143(1)*, 335-348.
105. Stella Impano, Hao Yang, Eric M. Shepard, Ryan Swimley, Adrien Pagnier, William E. Broderick, Brian M. Hoffman, and Joan B. Broderick, "S-Adenosyl-L-ethionine is a catalytically competent analog of S-adenosyl-L-methionine (SAM) in the radical SAM enzyme HydG," *Angew. Chemie* **2021**, *60(9)*, 4666-4672.
106. Maike N. Lundahl, Brigitta Nemeth, William E. Broderick, and Joan B. Broderick, "Radical S-Adenosyl-L-methionine Enzymes," *Comp. Coord. Chem. III* **2021**,
107. Eric M. Shepard, Stella Impano, Benjamin R. Duffus, Adrien Pagnier, Kaitlin S. Duschene, Jeremiah N. Betz, Amanda S. Byer, Amanda Galambas, Elizabeth C. McDaniel, Hope Watts, Shawn E. McGlynn, John W. Peters, William E. Broderick, and Joan B. Broderick, "HydG, the 'Dangler' Iron, and Catalytic Production of Free CO and CN<sup>-</sup>: Implications for [FeFe]-Hydrogenase Maturation," *Dalton Trans.* **2021**, *50(30)*, 10405-10422.
108. Devon Payne, Eric M. Shepard, Rachel L. Spietz, Katie Steward, Sue Brumfield, Mark Young, Brian Bothner, William E. Broderick, Joan B. Broderick, and Eric S. Boyd, "Examining pathways of iron and sulfur acquisition, trafficking, deployment, and storage in mineral-grown methanogen cells," *J. Bact.* **2021**, *203(19)*, e00146-21.
109. William G. Walls, James D. Moody, Elizabeth C. McDaniel, Maria Villanueva, Eric M. Shepard, William E. Broderick, and Joan B. Broderick, "The B<sub>12</sub>-independent glycerol dehydratase activating enzyme from *Clostridium butyricum* cleaves SAM to produce 5'-deoxyadenosine and not 5'-deoxy-5'-(methylthio)adenosine," *J. Inorg. Biochem.* **2022**, *227*, 111662.
110. Maike N. Lundahl, Raymond Sarkisian, Hao Yang, Richard J. Jodts, Adrien Pagnier, Donald F. Smith, Martin A. Mosquera, Wilfred A. van der Donk, Brian M. Hoffman, William E. Broderick, and Joan B. Broderick, "Mechanism of Radical S-Adenosyl-L-methionine Adenylation: Radical Intermediates and the Catalytic Competence of the 5'-Deoxyadenosyl Radical," *J. Am. Chem. Soc.* **2022**, *144(11)*, 5087-5098.
111. Katherine F. Steward, Devon Payne, Will Kincannon, Christina Johnson, Malachi Lensing, Hunter Fausset, Brigitta Németh, Eric M. Shepard, William E. Broderick, Joan B. Broderick, Jen Dubois, Brian Bothner, "Proteomic analysis of methanococcus voltae grown in the presence of mineral and nonmineral sources of iron and sulfur," *Microbiol. Spectrum* **2022**, *10 (4)*, e01893-22.
112. Adrien Pagnier, Batuhan Balci, Eric M. Shepard, Hao Yang, Douglas M. Warui, Stella Impano, Squire J. Booker, Brian M. Hoffman, William E. Broderick, and Joan B. Broderick, "[FeFe]-Hydrogenase: Defined Lysate-Free Maturation Reveals a Key Role for Lipoyl-H-Protein in DTMA Ligand Biosynthesis," *Angew. Chem. Int. Ed.* **2022**, *61*, e202203413.
113. Adrien Pagnier, Batuhan Balci, Eric M. Shepard, William E. Broderick, Joan B. Broderick, "[FeFe]-Hydrogenase In Vitro Maturation," *Angew. Chem. Int. Ed.* **2022**, *61 (49)*, e202212074.
114. Joan B. Broderick, William E. Broderick, and Brian M. Hoffman, "Radical SAM: Nature's Choice for Radical Reactions," *FEBS Lett.* **2023**, *597 (1)*, 92-101.
115. Batuhan Balci, Roark D. O'Neill, Eric M. Shepard, Adrien Pagnier, Alexander Marlott, Michael T. Mock, William E. Broderick, and Joan B. Broderick, "Semisynthetic Maturation of [FeFe]-Hydrogenase using [Fe<sub>2</sub>( $\mu$ -SH)<sub>2</sub>(CN)<sub>2</sub>(CO)<sub>4</sub>]<sup>2-</sup>: Key Roles for HydF and GTP," *Chem. Commun.* **2023**, *59 (58)*, 8929-8932.
116. Brian M. Hoffman, William E. Broderick, and Joan B. Broderick, "Mechanism of Radical Initiation in the Radical SAM Enzyme Superfamily," *Ann. Rev. Biochem.* **2023**, *92*, 333-349.

117. James D. Moody, Sarah Hill, Maike N. Lundahl, Aubrianna J. Saxton, Amanda Galambas, William E. Broderick, C. Martin Lawrence, and Joan B. Broderick, "A pyruvate formate-lyase activating enzyme variant computationally engineered for crystallization: Structural insights into S-adenosylmethionine binding and reductive cleavage," *J. Biol. Chem.* **2023**, 299 (6), 104791.
118. Richard J. Jodts, M. Wittkop, Madeline B. Ho, William E. Broderick, Joan B. Broderick, Brian M. Hoffman, and Martín A. Mosquera, "Computational Description of Alkylated Iron-Sulfur Organometallic Clusters," *J. Am. Chem. Soc.* **2023**, 145 (25), 13879-13887.
119. Maike N. Lundahl, Hao Yang, William E. Broderick, Brian M. Hoffman, and Joan B. Broderick, "Pyruvate formate-lyase activating enzyme: The catalytically active 5'-deoxyadenosyl radical caught in the act of H-atom abstraction," *Proc. Natl. Acad. Sci. U.S.A.* **2023**, 120 (47), e2314696120.
120. Hunter Fausset, Rachel L. Spietz, Savannah Cox, Gwendolyn Cooper, Scott Spurzem, Monika Tokmina-Lukaszewska, Jennifer DuBois, Joan B. Broderick, Eric M. Shepard, Eric S. Boyd, Brian Bothner, "A shift between mineral and nonmineral sources of iron and sulfur causes proteome-wide changes in *Methanosarcina barkeri*," *Microbiol. Spectrum* **2024**, in press.
121. Hao Yang, Madeline B. Ho, Maike N. Lundahl, Martín A. Mosquera, William E. Broderick, Joan B. Broderick, and Brian M. Hoffman, "ENDOR Spectroscopy Reveals the 'Free' 5'-Deoxyadenosyl Radical in a Radical SAM Enzyme Active Site Actually is Chaperoned by the Close Interaction with the Methionine-Bound [4Fe-4S]<sup>2+</sup> Cluster," *J. Am. Chem. Soc.* **2024**, in press.

#### INVITED LECTURES at Scientific Meetings

1. "Mechanistic Studies of an Adenosylcobalamin-Dependent Ribonucleotide Reductase," (w/ JoAnne Stubbe) Symposium on Mechanistic Bioinorganic Chemistry, 205th National Meeting of the American Chemical Society, Denver, CO, **1993**.
2. "Pyruvate Formate Lyase Activase: Radical Generation by an Fe-S Protein," Gordon Research Conference on Metals in Biology, Ventura, CA, January **1998**.
3. "Iron-Sulfur Clusters in Biological Radical Generation," Central Regional ACS Meeting, Columbus, OH, June **1999**.
4. "Iron-Sulfur Clusters in Biological Radical Generation," Gordon Research Conference on Inorganic Chemistry, Newport, RI, July **1999**.
5. "Pyruvate Formate-Lyase Activating Enzyme: Role of the Fe/S Cluster in Radical Generation," International Conference on Bioinorganic Chemistry (ICBIC9), Minneapolis, MN, July **1999**.
6. "Pyruvate Formate-Lyase Activating Enzyme: A Radical Role for an Fe-S Cluster," Gordon Research Conference on Free Radical Chemistry, Plymouth, NH, July **2001**.
7. "Pyruvate Formate-Lyase Activating Enzyme: A Radical Role for an Fe-S Cluster," Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, Meriden, NH, July **2001**.
8. "Pyruvate Formate-Lyase Activating Enzyme: A Radical Role for an Fe-S Cluster," Midwest Enzyme Chemistry Conference, Chicago, IL, October **2001**.
9. "Radical Roles for Fe-S Clusters," Saltman Lecture presented at the Gordon Research Conference on Metals in Biology, Ventura, CA, January **2002**.
10. "Paramagnetic Resonance in Mechanistic Studies of Fe-S/Radical Enzymes," 223<sup>rd</sup> National Meeting of the American Chemical Society, Symposium on Paramagnetic Resonance in Metallobiomolecules, Orlando, FL, **2002**.
11. "Radical Generation by Fe-S/Adenosylmethionine Enzymes," Gordon Research Conference on Inorganic Reaction Mechanisms, Ventura, CA, February **2003**.
12. "Generation and Quenching of Catalytically Essential Radicals", Gordon Research Conference on Protein Derived Cofactors, Radicals, and Quinones, Ventura, CA, January **2004**.
13. "Iron-Sulfur Clusters in AdoMet-Mediated Radical Chemistry," Steenbock Symposium on Fe-S proteins, Madison, WI, May **2005**.
14. "Radical Mechanisms of Protein Radical Generation and DNA Repair," Symposium on Activating and Reactivating Proteins for B12 and Radical Enzymes, Pacificchem, Honolulu, Hawaii, December **2005**.
15. "Unusual Properties of the [4Fe-4S] Cluster of a Radical SAM Enzyme: Implications for Mechanism," Gordon Research Conference on Protein Derived Cofactors, Radicals, and Quinones, Ventura, CA, January **2006**.

16. "Radical Generation in the Radical SAM Superfamily: Mechanistic Studies of Pyruvate Formate-Lyase Activating Enzyme," German Research Foundation (DRG) Conference on Radicals in Enzymatic Catalysis, Rauschholzhhausen, Germany, March **2006**.
17. "Radical Catalysis in the Radical SAM Superfamily," Gordon Research Conference on Iron-Sulfur Enzymes, New Hampshire, June **2006**.
18. "Structural Basis of a Radical SAM Activation," 13<sup>th</sup> International Conference on Biological Inorganic Chemistry (ICBIC-13), Vienna, Austria, July **2007**.
19. "Structural Insight into a [4Fe-4S] Cluster-Mediated Radical Reaction," Zing Coordination Chemistry Conference," Cancun, Mexico, March **2008**.
20. "Radical SAM Chemistry in DNA Repair," Symposium in honor of JoAnne Stubbe's 60<sup>th</sup> Birthday, MIT, July **2008**.
21. "Insights into H-cluster Assembly in the [FeFe]-Hydrogenase," International Conference on Biological Inorganic Chemistry (ICBIC-14), Nagoya, Japan, July **2009**.
22. "Novel Chemistry of Radical SAM Enzymes," Gordon Research Conference on Protein Cofactors, Radicals, and Quinones, Ventura, CA, January **2010**.
23. "Insights into the Assembly of the H-Cluster of [FeFe]-Hydrogenase," Frontiers in Metallobiochemistry, Penn State University, June **2010**.
24. "Unraveling the Mysteries of Hydrogenase H-Cluster Assembly - New Insights into the Roles of the Radical SAM Enzymes," Gordon Research Conference on Iron-Sulfur Proteins, New Hampshire, June **2010**.
25. "Insights into Maturation of the [FeFe]-Hydrogenase," National ACS Meeting, Goodman Symposium honoring JoAnne Stubbe, Boston, MA, August **2010**.
26. "Biosynthesis of the Catalytic Cluster of the World's Fastest Hydrogenase," Gordon Research Conference on Metals in Biology, Ventura, CA, January **2011**.
27. "Biosynthesis of the H-Cluster of Hydrogenase," Invited Keynote Lecture, International Conference on Bioinorganic Chemistry, Vancouver, BC, August **2011**.
28. "Biosynthesis of the H-Cluster of [FeFe]-Hydrogenase," International Conference on the Biogenesis of Iron-Sulfur Cofactors, Cambridge, UK, August **2011**.
29. "Radical Mechanisms of Metal Cofactor Biogenesis: The H-cluster of [FeFe]-Hydrogenase," American Chemical Society National Meeting, Bader Award Symposium for Brian Hoffman, San Diego, March **2012**.
30. "Radical mechanisms of metal cofactor biogenesis: The H-cluster of [FeFe]-hydrogenase," Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, New Hampshire, July **2012**.
31. "Radical Chemistry in H-Cluster Biogenesis," Gordon Research Conference on Protein-Derived Cofactors, Radicals, and Quinones, Massachusetts, July **2012**.
32. "Biogenesis of the H-Cluster of the [FeFe]-Hydrogenase," Invited lecture, ASBMB National Meeting, Boston, MA, April **2013**.
33. "Biosynthesis of the H-Cluster of the [FeFe]-Hydrogenase," Keynote Lecture, International Conference on Bioinorganic Chemistry, Grenoble, France, July **2013**
34. Invited Lecture, American Chemical Society National Meeting, Pfizer Award Symposium, Indianapolis, Sept **2013**
35. Invited Lecture, Gordon Research Conference on Iron-Sulfur Enzymes, June **2014**.
36. Invited Lecture, Northwest Regional Meeting, June 2014
37. "The Radical Chemistry of H-Cluster Maturation," Meeting of the German Biochemical Society, Mössbach, Germany, March **2015**.
38. "Controlling Biological Radical Reactions: Lessons from Radical SAM," American Chemical National Meeting, Boston MA, August **2015**.
39. "Mechanism and Control in Radical SAM Enzymes," Institute for Metals in Biology of Grenoble, Villard de Lans, France, September **2015**.
40. "Harnessing or Free? A Tale of Radical Intermediates in Radical SAM Enzymes," Ballou Fest, University of Michigan, Ann Arbor, MI, October **2015**.
41. "Harnessing or Free? A Tale of Radical Intermediates in Radical SAM Enzymes," Metals in Biology Gordon Research Conference, Ventura, CA, January **2016**
42. "Role of HydF in Hydrogenase Maturation," DOE-BES Physical Biosciences PI Meeting, Gaithersburg, MD, October **2016**
43. "Mechanism and Control in Radical SAM Reactions," Enzyme Mechanisms Conference, St. Petes Beach, FL, January 2017.

44. "Mechanism and Control in Radical SAM Reactions," ACS National Meeting, Chicago, IL, April **2017**.
45. "Mechanism and Control in Radical SAM Reactions," ASBMB National Meeting, Chicago, IL, April **2017**.
46. "Mechanism and Control in Radical SAM Reactions," International Conference on Hydrogen Atom Transfer, Rome, July **2017** {invited but had to decline for health reasons}.
47. "Mechanism and Control in Radical SAM Reactions," International Conference on Biological Inorganic Chemistry, Rio de Janeiro, Brazil, August **2017** {invited but had to decline for health reasons}.
48. "Mechanism and Control in Radical SAM Reactions," Potsdam University, Germany, September **2017**.
49. "Tools and Techniques for Studying FeS Proteins," SPP Summer School, Leipzig, Germany, September **2017**.
50. "Biosynthesis of the H-Cluster of [FeFe]-Hydrogenase," invited lecture, Energy Symposium, ACS National Meeting, March **2018**.
51. "Organometallic Chemistry in Radical SAM Enzymes," invited lecture, Symposium in Honor of Thomas Rauchfuss for his Distinguished Service to Inorganic Chemistry, ACS National Meeting, New Orleans, March **2018**.
52. "A New Paradigm for Radical SAM Mechanisms," Steenbock Symposium on FeS Proteins, Madison, WI, May **2018**.
53. "An Organometallic Intermediate in Radical SAM Reactions," Gordon Research Conference on Metallocofactors, Massachusetts, June **2018**.
54. "Role of HydF in Hydrogenase Maturation," DOE-BES Physical Biosciences PI Meeting, October **2018**.
55. "Organometallic Chemistry in Radical SAM Enzymes," Illinois Distinguished Lecture in Inorganic Chemistry, January **2019**.
56. "Novel Chemistry for Biological FeS Clusters: Radical Initiation via Organometallic Chemistry," Bader Award Lecture, ACS National Meeting, Orlando, FL, April **2019**.
57. "Organometallic Chemistry in Radical SAM Enzymes," Canadian Chemistry Conference, June **2019**.
58. "Radical SAM Enzymes: A Past, Present, and Future Full of Surprises," GRC on Enzymes, Coenzymes, and Metabolic Pathways, Vermont, July **2019**.
59. "The Surprising Inorganic Chemistry of the Radical SAM Enzymes," Metals in Biology GRC, Ventura, CA, Jan. **2020**.
60. "Surprising Intermediates in Radical SAM enzymes," International Conference on Cofactors, TAMU, TX, May **2020** {postponed due to Covid-19}.
61. "Organometallic Chemistry and Radical Initiation in Radical SAM Enzymes," Melvin Calvin Lecture, UC-Berkeley, October **2021**.
62. "Novel Radicals in Radical SAM Catalysis," Pacificchem Pacific Basin Chemistry Conference (virtual), December **2021**.
63. "Adventures in Radical SAM Catalysis: Re-designed reaction and mechanistic insight," ASBMB Annual Meeting, Philadelphia, PA, April **2022**.
64. "Radical SAM: How Nature Generates and Controls Radicals for Catalysis," Bollum Symposium, University of Minnesota, Minneapolis, MN, May **2022**.
65. "Mechanism of Radical Initiation in the Radical SAM Enzymes," Nobel Symposium on Bioinorganic Chemistry, Stockholm, **May 2022**.
66. "Mechanisms of Radical Initiation in the Radical SAM Enzymes," International Conference on Hydrogen Atom Transfer, Rome, June **2022**.
67. "Walking through a radical SAM reaction: 5'-Deoxyadenosyl radical as a catalytically competent intermediate," American Chemical Society National Meeting, Chicago, IL, **August 2022**.
68. "Iron/Sulfur Trafficking and Storage in Methanogens," FeS 2020, St. Maxime, France, September **2022**.
69. "Maturation of the [FeFe]-Hydrogenase," International Hydrogenase Conference, Walla Walla, Washington, July **2023**.

#### **INVITED LECTURES at Academic Institutions**

1992

University at Albany- SUNY

1994

Smith College

University of Massachusetts

1995

MIT Women in Chemistry Conference  
Connecticut College  
Wesleyan University

1996

Smith College, Women in Science Conference

1997

Massachusetts Institute of Technology  
Johns Hopkins University  
Michigan State University  
Penn State University  
Utah State University  
Kansas State University  
University of Maryland

1998

University of Pennsylvania  
University of Washington  
California Institute of Technology  
University of Minnesota  
University of St. Thomas  
University of Wisconsin-Osh Kosh

1999

University of Michigan  
Oakland University  
University of Helsinki, Finland  
Bemidjie State University  
St. Olaf College  
Gustavus Adolphus College  
John Carroll University

2000

University of Wisconsin-Milwaukee  
Emory University  
Hope College  
Calvin College  
University of New Mexico  
University of Wisconsin-Eau Claire

2001

University of Colorado  
University of Utah  
Colorado State University  
Washington State University  
University of Idaho  
University of South Carolina  
University of Georgia  
Ohio State University  
Stanford University  
University of California at Santa Cruz  
University of California at Davis  
University of California at Berkeley  
Miami University of Ohio  
Yale University  
University of California at Los Angeles  
University of California at Irvine  
University of California at San Diego  
University of Wisconsin at Madison  
Northwestern University

Johns Hopkins University  
Princeton University  
University of Houston  
Texas A&M University  
University of Illinois

2002

University of Minnesota – Duluth  
University of Delaware  
Kalamazoo College  
Kenyon College  
Purdue University-Indiana University at Fort Wayne

2003

Wayne State University (Biochemistry, Medical School)  
Emory University  
University of Washington  
Boston University  
University of Pennsylvania  
Montana State University  
Virginia Tech  
Wayne State University (Chemistry)  
University of Chicago

2004

University of California, Davis  
University of Rochester  
Duke University  
University of Michigan

2005

University of Nebraska, Lincoln  
Reed College  
Massachusetts Institute of Technology

2007

Washington State University  
University of Montana  
Montana Tech  
Montana State University Veterinary and Molecular Biology Department

2009

Utah State University  
Okayama University

2010

Texas A&M  
University of South Carolina

2011

University of Michigan  
Arizona State University  
University of Colorado – Colorado Springs

2012

University of Utah  
Florida International University

2013

University of Montana

2014

University of Washington  
Worcester Polytechnic Institute  
Northwestern University

2015

Emory University

2016

Michigan State University

2017

University of Washington

Northwestern University

Potsdam University

2018

University of Notre Dame

University of Portland

2019

University of Illinois

MIT

UC-Irvine

University of Michigan

2020

Duke University

Georgia Tech

2021

UC-Berkeley

#### **PAPERS PRESENTED AT PROFESSIONAL MEETINGS (partial listing)**

1. Joan T. Blanchette and T.V. O'Halloran, "Overproduction, Purification, and Characterization of a Catechol Dioxygenase with Broad Substrate Specificity," presented at the Fourth International Conference on Bioinorganic Chemistry, Boston, July **1989**.
2. Joan T. Blanchette and T.V. O'Halloran, "Broad Substrate Specificity of Chlorocatechol Dioxygenase from *Pseudomonas putida*," presented at the Ninth Annual Midwest Enzyme Chemistry Conference, Evanston, IL, October **1989**.
3. Joan B. Broderick, E.P. Day, and T.V. O'Halloran, "Spectroscopic Studies of Chlorocatechol Dioxygenase from *Pseudomonas putida*," presented at the Tenth Annual Midwest Enzyme Chemistry Conference, Chicago, IL, October **1990**.
4. Joan B. Broderick, S. Booker, and J. Stubbe, "Ribonucleotide Triphosphate Reductase from *Lactobacillus leichmannii*: Role of the Cysteine Residues in the Catalytic Mechanism" poster presented at the International Symposium on Recent Advances on Enzymes in Deoxyribonucleotide Synthesis, Saint-Sauveur-des-Monts, Québec, May, **1993**.
5. Sean J. Elliott, Jyllian N. Kemsley, Amy K. Barczak, William E. Broderick, and Joan B. Broderick, "A Ligand System for Distorted 4/5-Coordinate Metal Complexes: Modelling the Structural and chemical Properties of the Fe(II) Site in Lipoyxygenase" poster, 208th National Meeting of the American Chemical Society, Washington, D.C., August, **1994**.
6. Joan B. Broderick, Kristi Wojtuszewski, and Ryan M. McGhan, "Preliminary Identification of an Iron-Sulfur Cluster in Pyruvate Formate-Lyase Activating Enzyme," poster, Gordon Research Conference on Metals in Biology, Ventura, CA, January **1996**.
7. Joan B. Broderick, R.A. Duderstadt, D.C. Fernandez, Kristi Wojtuszewski, Timothy F. Henshaw, and Michael K. Johnson, "Pyruvate Formate-Lyase Activating Enzyme is an Iron-Sulfur Protein," poster, Gordon Conference on Quinone and Redox-Active Amino Acid Cofactors, Barga, Italy, May **1997**.
8. Joan B. Broderick, Sheila Smith, Timothy Henshaw, "Spectroscopic Characterization of Pyruvate Formate-Lyase," poster, Gordon Conference on Metals in Biology, Ventura, CA, January **1999**.
9. Joan B. Broderick, T.F. Henshaw, and J.C. Cheek, "Fe-S Cluster Interconversions in Pyruvate Formate-Lyase Activase," poster, Gordon Conference on Quinone and Redox-Active Amino Acid Cofactors, Meriden, NH, **1999**.
10. Timothy F. Henshaw, Sheila S. Smith, and Joan B. Broderick, "Spectroscopic and biophysical studies of pyruvate formate-lyase activating enzyme," Poster, International Conference on Bioinorganic Chemistry, Minneapolis, MN, July **1999**.



11. William E. Broderick, Joan B. Broderick, Lydia Finney, and Sean J. Elliott, "Production of a Borylperoxy-Fe(III) Complex via Dioxygen Activation," poster, International Conference on Bioinorganic Chemistry, Minneapolis, MN, **1999**.
12. William E. Broderick, Joan B. Broderick, Lydia Finney, and Sean J. Elliott, "Production of a Borylperoxy-Fe(III) Complex via Dioxygen Activation," poster, Gordon Research Conference on Inorganic Chemistry, Newport, RI, **1999**.
13. J. Cheek, T.F. Henshaw, and J.B. Broderick, "A Study of the Fe-S Cluster of Pyruvate Formate-Lyase Activating Enzyme and its Interactions with Substrate Analogues," Poster, Gordon Research Conferences Graduate Research Conference on Bioinorganic Chemistry, Ventura, CA, January **2000**.
14. T.F. Henshaw, J. Cheek, C. Krebs, B.-H. Huynh, J.B. Broderick, "Cluster Conversions and Redox Chemistry of PFL-AE," Poster, Gordon Research Conferences Graduate Research Conference on Bioinorganic Chemistry, Ventura, CA, January **2000**.
15. Joan B. Broderick, Timothy F. Henshaw, Jennifer Cheek, William E. Broderick, Wei Hong, Carsten Krebs, and Vincent Huynh, "Pyruvate Formate-Lyase Activating Enzyme: Properties of the Fe-S Cluster and Role of the Cluster in Radical Generation," Poster, Gordon Research Conference on Metals in Biology, Ventura, CA, January **2001**.
16. Joan B. Broderick, W. Hong, W. E. Broderick, T. F. Henshaw, J. Cheek, D. Ortillo, C. Krebs, B.-H. Huynh, C. Walsby, and B. M. Hoffman, "Pyruvate Formate-Lyase Activating Enzyme: A Radical Role for an Fe-S Cluster," Poster, Gordon Research Conference on Free Radical Chemistry, Plymouth, NH, July **2001**.
17. Joan B. Broderick, W. Hong, W. E. Broderick, T. F. Henshaw, J. Cheek, D. Ortillo, C. Krebs, B.-H. Huynh, C. Walsby, and B. M. Hoffman, "Pyruvate Formate-Lyase Activating Enzyme: A Radical Role for an Fe-S Cluster," Poster, Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, Meriden, NH, July **2001**.
18. Joan B. Broderick, Carsten Krebs, Timothy F. Henshaw, William E. Broderick, and Boi Hanh Huynh, "Pyruvate Formate-Lyase Activating Enzyme: Radical Generation by an Iron-Sulfur Cluster," Poster, 10<sup>th</sup> International Conference on Bioinorganic Chemistry, Florence, Italy, August **2001**.
19. William E. Broderick, Wei Hong, Danilo Ortillo, Charles Walsby, Brian M. Hoffman, and Joan B. Broderick, "Pyruvate Formate-Lyase Activating Enzyme: Interaction of Adenosylmethionine with the Iron-Sulfur Cluster," Poster, 10<sup>th</sup> International Conference on Bioinorganic Chemistry, Florence, Italy, August **2001**.
20. Jennifer Cheek, Carsten Krebs, Boi Hanh Huynh, Joan B. Broderick, "DNA Repair by an Fe-S/AdoMet Enzyme: Characterization of Spore Photoproduct Lyase," Poster, 10<sup>th</sup> International Conference on Bioinorganic Chemistry, Florence, Italy, August **2001**.
16. W. Hong, C. Walsby, W. E. Broderick, B. M. Hoffman, and J. B. Broderick, "Interaction of S-adenosylmethionine with the Iron-sulfur Cluster of Pyruvate Formate-Lyase Activating Enzyme," Poster, American Chemical Society National Meeting, Chicago, IL, August **2001**.
17. Jennifer Cheek, Carsten Krebs, Boi Hanh Huynh, Joan B. Broderick, "DNA Repair by an Fe-S/AdoMet Enzyme: Characterization of Spore Photoproduct Lyase," Poster, Midwest Enzyme Chemistry Conference, Chicago, IL **2001**.
18. Danilo Ortillo, Wei Hong, Charles Walsby, William E. Broderick, Jennifer Cheek, Brian M. Hoffman, and Joan B. Broderick "Interaction of S-Adenosylmethionine With the Iron-Sulfur Cluster of Pyruvate Formate-Lyase Activating Enzyme," Poster, Midwest Enzyme Chemistry Conference, Chicago, IL **2001**.
19. Joan B. Broderick, Charles Walsby, William E. Broderick, Carsten Krebs, Wei Hong, Danilo Ortillo, Boi Hanh Huynh, Brian M. Hoffman, and Joan B. Broderick "[4Fe-4S] cluster of pyruvate formate-lyase activating enzyme and its interaction with S-adenosylmethionine," Invited Poster, 223<sup>rd</sup> National Meeting of the American Chemical Society, Orlando, FL **2002**.
20. Joan B. Broderick, Jennifer Cheek, and Vincent Huynh, "DNA Repair by a Novel Fe/S-Radical Mechanism: Spore Photoproduct Lyase," Gordon Research Conference on Metals in Medicine, New Hampshire, July **2002**.
21. Joan B. Broderick, Jennifer Cheek, and Vincent Huynh, "DNA Repair by a Novel Fe/S-Radical Mechanism: Spore Photoproduct Lyase," Gordon Research Conference on Metals in Biology, Ventura, CA, February **2003**.
22. Joan B. Broderick, Jennifer Cheek, and Vincent Huynh, "DNA Repair by a Novel Fe/S-Radical Mechanism: Spore Photoproduct Lyase," Eleventh International Conference on Bioinorganic Chemistry, Cairns, Australia, July **2003**.

23. Mbako R. Nnyepi and Joan B. Broderick, "Quenching the Glycyl Radical of Pyruvate Formate-Lyase: Is AdhE a PFL Deactivase?" Gordon Research Conference on Protein-Derived Cofactors, Radicals, and Quinones, Ventura, CA, January **2004**.
24. Joan B. Broderick, Mbako R. Nnyepi, Jeffrey M. Buis, and Jennifer Cheek, "Generation and Quenching of Catalytically Essential Radicals", Gordon Research Conference on Metals in Biology, Ventura, CA, January **2004**.
25. Ortillo, D.; Walsby, C.J.; Phelan, R.; Broderick, William E.; Hoffman, B.M.; Broderick, J.B., "Investigating the Interaction Between the [4Fe-4S] Cluster of Pyruvate Formate-Lyase-Activating Enzyme (PFL-AE), a Radical SAM Enzyme, with S-Adenosylmethionine via EPR and ENDOR Spectroscopic Studies", 12<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-12), Ann Arbor, MI, July **2005**.
26. Peng, Y.; Yang, J.; Broderick, Joan B. "Kinetic Studies of Pyruvate Formate-lyase and Activation of Pyruvate Formate-lyase Mutants", 12<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-12), Ann Arbor, MI, July **2005**.
27. Yang, Jian; Naik, Sunil; Huynh, Boi Hanh; Broderick Joan B. "In vivo States of the Iron Sulfur Cluster of Pyruvate Formate-Lyase-Activating Enzyme." Paper presented at ICBIC-12, Ann Arbor, MI, **2005**
28. Ortillo, D.; Walsby, C.J.; Broderick, W. E.; Hoffman, B.M.; Broderick, J.B., "Investigating the Interaction Between the [4Fe-4S] Cluster of Pyruvate Formate-Lyase-Activating Enzyme (PFL-AE), a Radical SAM Enzyme, with S-Adenosylmethionine via EPR and ENDOR Spectroscopic Studies", Gordon Research Conference on Protein Derived Cofactors, Radicals, and Quinones, Ventura, CA, January **2006**.
29. Ortillo, D.; Walsby, C.J.; Broderick, W.E.; Hoffman, B.M.; Broderick, J.B., "The Interaction of S-adenosylmethionine and Pyruvate Formate-Lyase-Activating Enzyme:A Radical Activation", Gordon Research Conference on Iron-Sulfur Enzymes, New London, New Hampshire, June **2006**.
30. Yang, Jian; Naik, Sunil; Broderick, William E.; Huynh, Boi Hanh; Broderick Joan B. "Radical Generation in the Radical SAM Superfamily: Mechanistic Studies of Pyruvate Formate-Lyase Activating Enzyme." Gordon Research Conference on Iron-Sulfur Enzymes, New London, NH, **2006**.
31. Peng, Yi; Yang, Jian; Broderick, Joan B "Investigation on the First Step in Pyruvate Formate Lyase Catalysis." Gordon Research Conference on Iron-Sulfur Enzymes, New London, NH, **2006**
32. James M. Tiedje, John Davis, Sang-Hoon Kim, David Dewitt, Christina Harzman, Christi Hemming, Rachel Udelhoven, Kaitlin Duschene, Joan B. Broderick, and Terence L. Marsh, "Exploring the Genome and Proteome of *Desulfitobacterium hafniense* DCB-2 for its Protein Complexes Involved in the Reduction of Selenium and Iron," Genomes to Life Conference (DOE), Washington, D.C., **2007**.
33. Silver, Sunshine C; Buis, Jeffrey M; Broderick, Joan B "Investigations of Spore Photoproduct Lyase: DNA Repair in the Radical SAM Superfamily." Gordon Research Conference on Protein Cofactors, Radicals and Quinones, Ventura, CA, January, **2008**.
34. Veneziano, Susan E; Peng, Yi; Broderick, Joan B "Investigating the Activities of Pyruvate Formate Lyase and Its Activating Enzyme." Gordon Research Conference on Protein Cofactors, Radicals and Quinones, Ventura, CA, **2008**
35. Hutcheson, Rachel; Duschene, Kaitlin; Tigges, Michelle; Zilinskas, Egis; Broderick, Joan B.; Harzman, Christina; Hemming, Christi; Kim, Sang-Hoon; DeWitt, David; Tiedje, James M.; Marsh, Terence L.; Davis, John "*Desulfitobacterium hafniense* DCB-2: Protein Complexes Involved in the Reduction of Selenium." Gordon Research Conference on Protein Cofactors, Radicals and Quinones, Ventura, CA, **2008**
36. McGlynn, Shawn E; Shepard, Eric M; Winslow, Mark A; Naumov, Anatoli V; Duschene, Kaitlin S; Broderick, Joan B; Peters, John W "HydF as a Scaffold Protein in [FeFe] Hydrogenase H-cluster Biosynthesis." Gordon Research Conference on Protein Cofactors, Radicals, and Quinones, Ventura, CA, 2007
37. Chandra, T; Broderick, William E; Broderick, Joan B "Chemoselective deprotection of triethylsilyl ethers" Gordon Research Conference on Protein Cofactors, Radicals and Quinones, Ventura, CA, **2008**.
38. Chandra, T; Broderick, William E; Broderick, Joan B "Synthesis of Spore Photoproduct and its incorporation into oligonucleotides" Gordon Research Conference on Protein Cofactors, Radicals and Quinones, Ventura, CA, **2008**.
39. Joan B. Broderick, Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Eric M. Shepard, and William E. Broderick, "Stereoselectivity in a radical-AdoMet DNA repair reaction," Gordon Research Conference on Metals in Biology," Gordon Research Conference on Metals in Biology, Ventura, CA, **2009**.

40. Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Shourjo Ghose, Eric M. Shepard, William E. Broderick, Joan B. Broderick, "Stereospecific repair of the 5R Spore photoproduct by spore photoproduct lyase," International Conference on Bioinorganic Chemistry, Nagoya, Japan, **2009**.
41. Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Shourjo Ghose, Eric M. Shepard, William E. Broderick, Joan B. Broderick, "Stereospecific repair of the 5R Spore photoproduct by spore photoproduct lyase," Gordon Research Conference on Protein Cofactors, Radicals, and Quinones, Ventura, CA, **2010**.
42. Eric M. Shepard, Shawn E. McGlynn, Alexandra L. Bueling, Celestine S. Grady-Smith, Simon J. George, Mark Winslow, Stephen P. Cramer, John W. Peters, and Joan B. Broderick, "Synthesis of the 2Fe-subcluster of the [FeFe]-hydrogenase H-cluster on the HydF scaffold," Gordon Research Conference on Protein Cofactors, Radicals, and Quinones, Ventura, CA, **2010**.
43. Rachel U. Hutcheson, Joan B. Broderick, "Radical SAM Enzymes and Their Role in Methylthiolation," MSU Graduate Recruitment Weekend, Bozeman, Montana, **2010**.
44. Benjamin R. Duffus, Eric M. Shepard, Shawn E. McGlynn, Alexandra L. Bueling, Mark A. Winslow, John W. Peters and Joan B. Broderick "Biochemical Characterization of HydF, a Scaffolding Enzyme, in the Synthesis of the Hydrogenase Active Site Metal Center: Implications Towards the Evolution of Biocatalysts from Mineral-Based Components on Early Earth" Astrobiology Science Conference, League City, TX **2010**.
45. Benjamin R. Duffus, Eric M. Shepard, Shawn E. McGlynn, Rebecca C. Driesener, Martin R. Challand, Simon J. George, Stephen P. Cramer, Peter L. Roach, William E. Broderick, John W. Peters and Joan B. Broderick "Biochemical Investigation of HydG, a Radical S-Adenosylmethionine Enzyme in the Synthesis of the Hydrogenase Active Site Metal Center: Insights into H-cluster Biosynthesis" Gordon Research Conference on Iron-Sulfur Enzymes, New London, NH, **2010**.
46. Shourjo Ghose, Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Joan B. Broderick, "Exploring the Thermodynamic and Mechanistic Parameters of the DNA Repair Enzyme Spore Photoproduct Lyase," Frontiers of Metallobiochemistry Summer Symposium, Penn State University, University Park, PA **2010**.
47. Shourjo Ghose, Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Joan B. Broderick, "Exploring the Thermodynamic and Mechanistic Parameters of the DNA Repair Enzyme Spore Photoproduct Lyase," MSU Research Celebration, Bozeman, MT **2010**.
48. Shourjo Ghose, Sunshine C. Silver, Tilak Chandra, Egidijus Zilinskas, Joan B. Broderick, "Exploring the Thermodynamic and Mechanistic Parameters of the DNA Repair Enzyme Spore Photoproduct Lyase," MSU Graduate Student Recruiting, Bozeman, MT **2010**.
49. Krista A. Shisler, Rachel U. Hutcheson, Masaki Horitani, George Cutsail III, Brian M. Hoffman, Joan B. Broderick, "Exploration of a Radical Intermediate and Valence Localization of PFL-AE," Gordon Research Conference: Protein Cofactors, Radicals & Quinones, Mount Holyoke College, South Hadley, MA **2012**.
50. Benjamin R. Duffus, Eric M. Shepard, Simon J. George, Rebecca C. Driesener, Martin R. Challand, Kevin D. Swanson, Peter L. Roach, Stephen P. Cramer, John W. Peters, Joan B. Broderick, "Diatom Ligand Biosynthesis by Radical AdoMet Enzyme HydG in [FeFe]-Hydrogenase H-Cluster Maturation," International Conference of Biological Inorganic Chemistry, Vancouver, BC, Canada **2011**.
51. Eric M. Shepard, Benjamin R. Duffus, Trevor E. Beard, John W. Peters, and Joan B. Broderick, "Biochemical Characterization of HydG, a Radical S-Adenosylmethionine Enzyme, in the Synthesis of the Hydrogenase Active Site Metal Center: Implications Towards the Evolution of Biocatalysts from Mineral-Based Components on Early Earth," NASA-Nordic Astrobiology Winter School: Water and the Evolution of Life in the Universe, University of Hawai'i, HI **2011**.
52. Benjamin R. Duffus, Eric M. Shepard, Trevor E. Beard, John W. Peters, Joan B. Broderick, "Defining Structural Determinants in the Evolution of Fe-S Biocatalysts from Mineral-Based Components on Early Earth: Biochemical Characterization of Radical S-Adenosylmethionine Enzyme HydG from [FeFe]-Hydrogenase," Nordic-NASA Summer School in Astrobiology, Reykjavik, Iceland **2012**.
53. Adam Crain, Joan B. Broderick, "Protein-protein Interactions Involved in Pyruvate Formate-Lyase Activation by Pyruvate Formate-Lyase Activating Enzyme and Flavodoxin", Graduate Recruiting Research Celebration Poster Presentation at Montana State University Bozeman, MT **2012**.
54. Eric M. Shepard, Shourjo Ghose, Nicholas W. Boswell, Kaitlin S. Duschene, Amanda S. Byer, Benjamin R. Duffus, John W. Peters, and Joan B. Broderick, "Progress in Understanding the Steps Required for 2Fe Subcluster Biosynthesis in [FeFe]-Hydrogenase Maturation," 2<sup>nd</sup> Penn State Bioinorganic Workshop, Penn State University, University Park, PA **2012**.

55. Adam Crain, Joan B. Broderick, "Characterization of Flavodoxin (FldA) from Escherichia coli: The Putative Electron Donor for Pyruvate Formate-Lyase Activating Enzyme", Protein Cofactors, Radicals & Quinones at Mount Holyoke College, South Hadley, MA **2012**.
56. Benjamin R. Duffus, Rebecca C. Driesener, Ian R. Bruzas, Eric M. Shepard, Shourjo Ghose, Peter L. Roach, John W. Peters, Joan B. Broderick, "Mechanistic Insight of Diatomic Ligand Biosynthesis by Radical AdoMet Enzyme HydG in [FeFe]-Hydrogenase H-Cluster Maturation," International Conference of Biological Inorganic Chemistry, Grenoble, France **2013**.

#### CONFERENCE SESSIONS CHAIRED (partial list)

- Gordon Research Conference on Quinone and Redox-Active Amino Acid Cofactors, Italy, May **1997**  
Session on Glycyl Radical Generation.
- Gordon Research Conference on Quinone and Redox-Active Amino Acid Cofactors Meriden, NH, June **1999**  
Session on Glycyl Radical Enzymes.
- Gordon Research Conference on Free Radical Reactions, Holderness, NH, July **2001**  
Session on Protein and Enzyme Radical Chemistry.
- Gordon Research Conference on Protein Cofactors, Radicals, and Quinones, Ventura, CA, January **2002**  
Session on Radicals in Catalysis/Biogenesis of Fe/S Cofactors.
- American Chemical Society National Meeting, Symposium on Paramagnetic Resonance in Biological Molecules, In Honor of Brian M. Hoffman's 60<sup>th</sup> Birthday, Orlando, Florida, March **2002**
- 11<sup>th</sup> International Conference on Bioinorganic Chemistry (ICBIC-11), Cairns, Australia, July **2003**  
Final Plenary Session
- Graduate Research Seminar in Bioinorganic Chemistry (GRC), Ventura, CA, January **2004**  
Session on Metals, Proteins, and Nucleic Acids.
- Gordon Research Conference on Iron-Sulfur Enzymes, New Hampshire, June **2008**  
Session on Aconitase, Radical SAM, and DNA/RNA-Related Enzymes
- ASBMB National Meeting, Boston, MA, April **2013**  
Session on "Cool Catalysis and Radically New Reaction Mechanisms"

#### CURRENT AND PAST TRAINEES

##### Current Trainees

|                | <u>Position in my lab</u> | <u>Previous Education</u>       |
|----------------|---------------------------|---------------------------------|
| Eric Shepard   | Asst. Research Professor  | Ph.D., Montana State University |
| Adrien Pagnier | Postdoc                   | Ph.D., Grenoble, France         |
| Emily Dieter   | Postdoc                   | Ph.D., University of Washington |
| Oleg Zadovorny | Postdoc                   |                                 |
| Batu Balci     | Graduate Student          |                                 |
| William Walls  | Graduate Student          |                                 |
| Chioma Irozuru | Graduate Student          |                                 |
| Alex Marlott   | Graduate Student          |                                 |
| Abraham Teye   | Graduate Student          |                                 |
| Andrew Gleason | Graduate Student          |                                 |
| Jared Green    | Undergraduate Student     |                                 |
| Tyler Delridge | Undergraduate Student     |                                 |

##### Past Research Students and Trainees

|                    | <u>Degree Granted/Position in my lab</u> | <u>Subsequent or current position, if known</u> |
|--------------------|--|---|
| Maike Blakely      | Postdoc                                  | Research Scientist, University of Washington    |
| Brigitta Néméth    | Postdoc                                  |   |
| Garrett Ollrogg    | Graduate Student                         |   |
| Katherine Kaul     | Undergraduate Student                    |   |
| Stella Impano      | Ph.D. 2020                               | Postdoc, Boston U.                              |
| Elizabeth McDaniel | Ph.D. 2020                               | Assistant Prof., Embry-Riddle University        |
| Ryan Swimley       | B.S. 2021                                |   |

|                    |                          |  |
|--------------------|--------------------------|--|
| Bryn Welker        | Undergraduate Student    |  |
| Amanda Galambas    | B.S. 2018                | Medical School, WWAMI                          |
| Amanda Byer        | Ph.D. 2018               | Postdoc, Cornell                               |
| Hope Watts         | B.S. 2018                | Res. Assoc., Cornell                           |
| Anna Scott         | B.S. 2017                | Ph. D. Student, Caltech                        |
| James Moody        | Postdoc 2017             | Assistant Prof., BYU                           |
| Krista Shisler     | Ph.D. 2016               | Postdoc, Washington State U.                   |
| Don Wright         | B.S. 2015                | Medical School, Vanderbilt                     |
| Aleks Abrahamowicz | B.S. 2015                | Medical School, WWAMI                          |
| Jeremiah Betz      | Ph.D. 2015               | Assoc. Prof., Air Force Academy                |
| Benjamin Duffus    | Ph.D. 2014               | Postdoc, Pottsdam U., Germany                  |
| Rachel Hutcheson   | Ph.D. 2012               | Assistant Professor, St. Benedicts/St. Johns   |
| Adam Crain         | Ph.D. 2013               | Postdoc, University of Washington              |
| Shourjo Ghouse     | Ph.D. 2013               | Postdoc, Scripps Florida                       |
| Meghan Clark       | REU Student, 2013        |  |
| Ian Bruzas         | REU Student, 2012        | Graduate Student, Purdue                       |
| Katherin Leckie    | Undergraduate, B.S. 2010 |  |
| Ashley Rasmussen   | REU Student, 2011        |  |
| Christie Green     | REU Student, 2010        |  |
| Nicholas Boswell   | M.S. 2011                | Research Technician, Washington State U.       |
| Tilak Chandra      | Postdoc                  | University of Wisconsin, Chemical Safety       |
| Sunshine Silver    | Ph.D. 2010               | Assistant Professor, Concordia U. - Chicago    |
| Egidijus Zilinskus | Ph.D. 2010               | Visiting Assistant Professor, Hamilton College |
| Susan Veneziano    | Postdoc                  | BioScience Labs, Bozeman, MT                   |
| Jennifer Creamer   | Undergraduate Student    |  |
| Heather Dewar      | Undergraduate Student    |  |
| Alexandra Bueling  | M.S. 2009                | Research Associate, MSU                        |
| Jian Yang          | Ph.D. 2007               | Postdoc, UCLA                                  |
| Peng Yi            | Ph.D. 2007               | Research Scientist, China                      |
| Jeffrey Buis       | Ph.D. 2006               | Postdoc, University of Michigan                |
| Danilo Ortillo     | Ph.D. 2005               | Faculty, U. of Philipinnes                     |
| Magdalena Gryszka  | Postdoctoral Associate   | Postdoctoral Associate, Michigan State U.      |
| Efthalia Kalliri   | Graduate Student         |  |
| Meng Li            | Graduate Student         |  |
| Liton Roy          | Graduate Student         | Graduate Student, Michigan State University    |
| Ziyang Su          | Graduate Student         | Graduate Student, Purdue University            |
| Shujuan Xu         | Graduate Student         | Graduate Student, Michigan State University    |
| Emily McAllister   | Undergraduate Student    |  |
| Christopher Austin | Undergraduate Student    |  |
| Mbako R. Nnyepi    | Ph.D. 2004               | Research Technician, Bay area                  |
| Timothy F. Henshaw | Ph.D. 2004               | Professor, University of Botswana              |
| Jim Ziegler        | Postdoctoral Assoc.      | Assistant Professor, Aquinas College           |
| Jennifer Cheek     | NIH Postdoc. Fellow      |  |
| Brian Facione      | Undergraduate            | Senior Technical Specialist, Abbott Labs       |
| John Hunt          | Undergraduate            |  |
| Wei Hong           | M.S. 2001                | Research Scientist, SynPep                     |
| Silvana Maritano   | Postdoctoral Associate   |  |
| Dan Wood           | CEM 186H lab project     |  |
| Kelly LeBoeuf      | B.S. 2001                | Research Assistant, Pfizer                     |
| Beverly Schad      | NSF-REU student          |  |
| Jill Morris        | NSF-REU student          |  |
| Chris Guyer        | Undergraduate            |  |
| Amy Kopf           | B.S. 2000                | Ph.D. Program, Northwestern                    |
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| Patrick Long        | NSF-REU student     |                                       |
| Benjamin Messmore   | NSF-REU student     | Ph.D. Program, Northwestern           |
| Lydia Finney        | NSF-REU student     | Staff Scientist, Argonne National Lab |
| Meghan Kibbey       | NSF-REU student     | DMD/PhD Prog., Med.Coll. S. Carolina  |
| Elizabeth Dell      | B.A., 1998          |                                       |
| Daniel Fernandez    | B.A., 1997          | M.D.                                  |
| Jeffrey Barnes      | B.A., 1997          |                                       |
| Timothy Henshaw     | B.A., 1997          | Assistant Professor, Aquinas College  |
| Paula Pinell-Salles | B.A., 1996          | M.D.                                  |
| Elena Karp          | B.A., 1996          | M.D.                                  |
| Matthew Trojan      | B.A., 1995          | M.D.                                  |
| Zachary Shriver     | B.A., 1995          | V.P. Research, Visterra               |
| Ryan McGhan         | B.A., 1995          | M.D.                                  |
| Henry Gibbons       | B.A., 1995          | Research Scientist, US Army           |
| Jyllian Kemsley     | B.A., 1994          | Assoc. Editor, C&E News               |
| Sean Elliott        | B.A., 1994          | Professor, Boston University          |