

Anne Katherine Jones

School of Molecular Sciences
(formerly Department of Chemistry and Biochemistry)
Arizona State University
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Education

- D. Phil. 2002 Inorganic Chemistry, Oxford University, UK
Dissertation Advisor: Fraser Armstrong. Dissertation Title: *Investigations of electron transfer in redox enzymes*
- B. S. 1998 Chemistry and Mathematics, University of the South, Sewanee, TN
Summa cum laude (University Salutatorian)

Academic Appointments

- Arizona State University, School of Molecular Sciences**
(formerly Department of Chemistry and Biochemistry)
Associate Director of Academic Affairs for the School of Molecular Sciences August 2015 - present
Associate Professor (with tenure) August 2013 - present
Assistant Professor January 2007 - August 2013
Department of Chemistry and Biochemistry
Member of the Center for Bioenergy and Photosynthesis
- Visiting Professor Aix Marseille Université and Fellow in Residence of Institut D'Etudes Avancées Exploratoire Méditerranéen de l'Interdisciplinarité** 2014
University of Pennsylvania
NIH NRSA Postdoctoral Fellow with P. L. Dutton 2004-2006
Humboldt Universität zu Berlin (Germany) 2002-2004
Humboldt Research Fellowship with Bärbel Friedrich
- Oxford University (UK)** 1998-2002
Rhodes Scholar and NSF Graduate Fellow with Fraser Armstrong

Fellowships and Awards

DOE Faculty Early Career Award (CAREER)	2012-2017
Camille and Henry Dreyfus Special Grant in the Chemical Sciences	2009
Air Force Office of Scientific Research Young Investigator Award (CAREER)	2007-2011
NIH-NRSA Post-Doctoral Fellowship	2005-2006
Alexander von Humboldt Post-Doctoral Fellowship	2002-2004
NSF Graduate Fellowship	1998-2002
Rhodes Scholar (Oxford University)	1998-2001
Graduated <i>summa cum laude</i> from the University of the South	1998

Current Extramural Research Funding

Department of Energy 6/1/2012-5/31/2017
 "Early Career Award: Utilization of protein film electrochemistry to characterize the mechanisms imparting aerotolerance and bidirectionality in soluble, multimeric [NiFe]-hydrogenases"
 Award Amount : \$750,000 Jones's Share 100%
 Role: PI

Department of Energy 8/1/2014-6/30/2018
 "EFR Center for Biological Electron Transfer and Catalysis (BETCy)"
 Award Amount : \$10,000,000 Jones's Share 7%
 Role: co-PI PI: J. Peters (Montana State); co-PIs: Michael Adams (UGA), Brian Bothner (Montana State), Eric Boyd (Montana State), Ross Carlson (Montana State), Caroline Harwood (University of Washington), Paul King (NREL), Pin-Ching Maness (NREL), Anne-Frances Miller (University of Kentucky), Lance Seefeldt (Utah State)

National Science Foundation/ BBSRC (UK) 6/1/2014-5/31/2017
 "Plug and Play Photosynthesis for RuBisCO Independent Fuels"
 Award Amount: \$465,247 Jones's Share 100%
 Role: PI, co-PIs: J. Golbeck (Pennsylvania State University), D. Kramer (Michigan State University), I. Matsumura (Emory University School of Medicine; British Team: L Cronin (PI) (Glasgow University), co-PIs: T. Bayer (Imperial College) and T. Bibby (Univ. Southampton)—
co-PI awards are separate financially

National Science Foundation 7/1/2012-6/30/2017
 "IGERT: Solar Utilization Network (SUN)"
 Award Amount : \$3,498,193 Jones's share: 0%
 Role: Faculty Participant PI: W. Vermaas; 16 additional ASU co-PIs/participants

Proposals (2016)

Pending

Howard Hughes Medical Institute Professor 1/1/2018-12/31/2022
 "Molecular Thinking: A Lower Division Chemistry Curriculum Aligned with 21st Century Sciences"
 Award Amount : \$1,500,000 Jones's share: 50%
 Role: co-PI with Ian Gould

Not Recommended for Funding:

NSF: Centers for Chemical Innovation (Pre-proposal) 2017-2020
 "Center for Pseudocarbonyne Prediction, Synthesis and Characterization"
 Award Amount : \$1,800,000 Jones's share: 50%
 Role: co-PI with T. Steimle, S. Sayers, P. Tarakeshwar; PI: Peter Buseck

NSF: Origin of Life Ideas Lab 2016-2019
 "Pre-proposal for Origin of Life Ideas Lab"
 Award Amount : \$450,000 Jones's share: 50%
 Role: PI

Recently Completed Extramural Research Funding

Internal (Arizona State University; Light Works) 8/1/2014-6/30/2016
 "Solar Powered Hydrogen Using Heliobacteria in a Photobioelectrochemical Cell"
 Award Amount : \$82,000 Jones's share: 33%
 Role: co-PI PI: K. Redding; co-PI Sudeep Popat

National Science Foundation/ BBSRC (UK) 3/15/2011-2/28/2015
 "Plug and Play Photosynthesis for RuBisCO Independent Fuels"
 Award Amount: \$3,393,438 Jones's Share 29%
 (\$ 1, 578,000 For American Component) (of American Component)
 Role: PI, co-PIs: J. Golbeck (Pennsylvania State University), D. Kramer (Michigan State University), I. Matsumura (Emory University School of Medicine; British Team: L Cronin (PI) (Glasgow University), co-PIs: T. Bayer (Imperial College) and T. Bibby (Univ. Southampton)

Department of Energy 7/1/2009-6/30/2014
 "EFR Center for Bioinspired Solar Fuel Production"
 Award Amount : \$14,754,000 Jones's Share 9%
 Role: co-PI PI: D. Gust; 9 additional ASU co-PIs.

Air Force Office of Scientific Research 11/1/2007-8/31/2011
 "Engineering oxidoreductases: Utilization of an unnatural amino acid to create artificial hydrogenases"
 Award Amount : \$351,244 Jones's Share 100%
 Role: PI

Camille and Henry Dreyfus Foundation 3/1/2009-12/31/2010
 " Development of a sophomore course 'Introduction to Sustainable Chemistry' "
 Award Amount : \$25,000 Jones's Share 100%
 Role: PI

Science Foundation of Arizona 7/1/2008-6/30/2009
 "Engineering membrane proteins for electrocatalytic CO₂ reduction"
 Award Amount : \$100,000 Jones's Share 50%
 Role: co-PI PI: G. Ghirlanda; co-PI: A. Jones

Publications

Boxed region describes my role for papers since coming to ASU in 2007.

* indicates Jones as senior (corresponding) author	<u>Underline</u> denotes graduate students in Jones Group.	<u>Double-underline</u> indicates Post-doctoral fellows in Jones Group.	<u>Dotted underline</u> indicates undergraduate in Jones Group	† indicates other ASU graduate/undergraduate student
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A. Peer-Reviewed Journal Articles

33. S. Roy, J. A. Laureanti, T. L. Groy, A. K. Jones*. Synthesis and electrocatalytic activity of [FeFe]-H₂ase model complexes with non-innocent chelating nitrogen-donor ligands. *Eur. J. Inorg. Chem.*, **2017**, *in review*.

Designed research, interpreted results, wrote and edited the majority of the paper.

32. C. E. Lubner, D. P. Jennings, D. W. Mulder, G. J. Schut, O. A. Zadvornyy, J. Hober, M. Tokmina-Lukaszewska, L. Berry, D. Nguyen, G. L. Lipscomb, B. Bothner, A. K. Jones, A.-F. Miller, P. W. King, M. W. W. Adams, J. W. Peters. Mechanistic Insights into Energy Conservation by Flavin-Based Electron Bifurcation. *Nat. Chem. Biol.*, **2017**, *in press*.

Designed and supervised electrochemical experiments. Participated in drafting and revising manuscript.

31. Raja Pal[†], Joseph A. Laureanti, Thomas L. Groy, Anne K. Jones*, Ryan J. Trovitch*. Hydrogen production from water using a bis(imino)pyridine molybdenum electrocatalyst. *Chem. Commun.*, **2016**, 52: 11555-11558, DOI: 10.1039/c6cc04946j .

The complex was designed and prepared by the group of RJT. Designed and supervised electrochemical experiments. Participated in drafting and revising manuscript.

30. J. W. Peters, A.-F. Miller, A. K. Jones, P. W. King, M. W. W. Adams. Electron Bifurcation. *Cur. Opin. Chem. Biol.*, **2016**, 31: 146-152, DOI: 10.1016/j.cpb.2016.03.007.

This is a review article on the recently discovered biological energy conservation mechanism now referred to as electron bifurcation. I wrote the section describing gating in this process.

29. P. Kwan, C. L. McIntosh, D. P. Jennings, R. C. Hopkins, S. K. Chandrayan, C.-H. Wu, M. W. W. Adams, A. K. Jones*. The [NiFe]-Hydrogenase of *Pyrococcus furiosus* Exhibits A New Type of Oxygen-Tolerance. *J. Am. Chem. Soc.* **2015**, 137(42): 13556-13565, DOI: 10.1021/jacs.5b07680.

Designed research, interpreted results, wrote and edited the majority of the paper in collaboration with MWWA. Enzyme purified in the group of MWWA.

28. S. Roy, T.-A. D. Nguyen, L. Gan, A. K. Jones*. Biomimetic peptide-based models of [FeFe]-hydrogenases: Utilization of phosphine-containing peptides. *Dalton Trans.*, **2015**, 44: 14865-14876, DOI: 10.1039/C5DT01796C.

Designed research, interpreted results, wrote and edited the majority of the paper.

27. T. K. Mukhopadhyay[†], N. L. MacLean[†], L. Gan, D. C. Ashley, T. L. Groy, M.-H. Baik*, A. K. Jones*, R. J. Trovitch*. Carbon Dioxide Promoted H⁺ Reduction Using a Bis(imino)pyridine Manganese Electrocatalyst. *Inorg. Chem.*, **2015**, 54(9): 4475-4482, 10.1021/acs.inorgchem.5b00315.

The study was initially conceived by R. J. Trovitch and synthetic work undertaken in his group. M-H Baik led the DFT studies. My group helped design and complete the electrochemical studies. In addition, I was engaged in writing and editing the paper.

26. L. Gan, T. L. Groy, P. Tarakeshwar, S. K. S. Mazinani[†], J. Shearer, V. Mujica, and A. K. Jones*. A [NiFe] phosphine Complex as a Fast and Efficient Hydrogen Production Catalyst, *J. Am. Chem. Soc.*, **2015**, 137(3), 1109-1115.

Designed research, interpreted results, wrote and edited the majority of the paper. DFT calculations performed by the group of V. Mujica.

25. S. Roy, S. K. S. Mazinani[†], T. L. Groy, L. Gan, P. Tarakeshwar, V. Mujica, A. K. Jones*. Catalytic Hydrogen Evolution by Fe(II) Carbonyls Featuring a Dithiolate and a Chelating Phosphine, *Inorg. Chem.*, **2014**, 53(17), 8919-8929.

Designed research, interpreted results, wrote and edited the majority of the paper. DFT calculations performed by the group of V. Mujica.

24. A. Cereda, A. Hitchcock, M. D. Symes, L. Cronin, T. S. Bibby, A. K. Jones*. A Bioelectrochemical Approach to Characterize Extracellular Electron Transfer by *Synechocystis* sp. PCC6803, *PLOS One*, **2014**, 9(3), e91484.

Designed research, interpreted results, wrote and edited the majority of the paper. Molecular biology work done in the group of T. S. Bibby.

23. A. Dutta, M. Flores, S. Roy, J. Schmitt, G. A. Hamilton[†], H. E. Hartnett, J. Shearer, A. K. Jones*. Sequential Oxidations of the Thiolates and the Cobalt Metallocenter in a Synthetic Metallopeptide: Implications for the Biosynthesis of Nitrile Hydratase, *Inorg. Chem.* **2013**, 52(9), 5236-5245 DOI: 10.1021/ic400171z.

Designed research, interpreted results, wrote and edited the majority of the paper. Mass spectrometry done in the group of H. Hartnett. XAS spectroscopy completed in collaboration with J. Shearer. EPR spectroscopy undertaken in collaboration with M. Flores.

22. S. Roy, T. L. Groy, A. K. Jones*. Artificial hydrogenases: Asymmetrically disubstituted diiron model complex with a redox active 2,2'-bipyridyl ligand, *Dalton Trans.* **2013**, 42, 3843-3853 DOI: 10.1039/C2DT32195E.

Designed research, interpreted results, wrote and edited the majority of the paper. X-ray crystal structure solved by Dr. T. L. Groy.

21. A. Dutta, G. A. Hamilton[†], H. E. Hartnett, A. K. Jones*. Construction of Heterometallic Clusters in a Small Peptide Scaffold as [NiFe]-hydrogenase models: Development of a Synthetic Methodology. *Inorg. Chem.* **2012**; 51(18), 9580-9588 <http://dx.doi.org/10.1021/ic2026818>

Designed research, interpreted results, wrote and edited the majority of the paper. Mass spectrometry done in group of H. Hartnett.

20. I. Ashur, A. K. Jones*. Immobilization of azurin with retention of its native electrochemical properties at alkylsilane self-assembled monolayer modified indium tin oxide. *Electrochim. Acta.* **2012**, 85, 169-174, DOI: 10.1016/j.electacta.2012.08.044

Designed research, interpreted results, wrote and edited the majority of the paper.

19. I. Ashur, O. Schulz[†], C. McIntosh, I. Pinkas, R. Ros, A. K. Jones*. Transparent gold as a platform for unmediated protein spectroelectrochemistry: investigation of cytochrome *c* and azurin. *Langmuir.* **2012**, 28(13), 5861-5871. <http://pubs.acs.org/doi/abs/10.1021/la300404r>

Designed research, interpreted results, wrote and edited the majority of the paper. AFM experiments completed in group of R. Ros.

18. P. Kwan, D. Schmitt[†], A. M. Volosin[†], C. L. McIntosh, D.-K. Seo, A. K. Jones*. Spectroelectrochemistry of cytochrome *c* and azurin immobilized in nanoporous antimony tin oxide. *Chem. Commun.* **2011**, 47, 12367-12369. <http://pubs.rsc.org/en/content/articlelanding/2011/cc/c1cc14881h>

Designed research, interpreted results, wrote and edited the majority of the paper. ATO synthesized in group of D. Seo.

17. C. L. McIntosh, F. Germer, R. Schulz, J. Appel, A. K. Jones*. The [NiFe]-hydrogenase of the cyanobacterium *Synechocystis* sp. PCC 6803 is working bidirectionally. *J. Am. Chem. Soc.* **2011**, 133(29), 11308-11319. <http://pubs.acs.org/doi/abs/10.1021/ja203376y>

Designed research, interpreted results, wrote and edited the majority of the paper. Enzyme purified in group of R. Schulz and J. Appel.

16. S. Roy, S. Shinde[†], G. A. Hamilton[†], H. E. Hartnett, A. K. Jones*. Artificial [FeFe] hydrogenase: On resin modification of an amino acid to anchor a diiron-hexacarbonyl cluster in a peptide framework. *Eur. J. Inorg. Chem.* **2011**, 7, 1050-1055. (Hydrogenase special issue)

Designed research, interpreted results, wrote and edited the majority of the paper. Mass spectrometry done in group of H. Hartnett.

15. G. Winter, S. Dökel, N. Krauss, A. K. Jones, W. Höhne, B. Friedrich. Crystallization and preliminary X-ray crystallographic analysis of the [NiFe] hydrogenase maturation factor HypF1 from *Ralstonia eutropha* H16, *Acta Cryst. F*, **2010**, 66(part 4), 452-455.

Designed research, crystallized protein, minor editing of the paper.

14. A. K. Jones*, B. R. Lichtenstein, A. Dutta, G. Gordon, P. L. Dutton. Synthetic hydrogenases: Incorporation of an iron carbonyl thiolate into a designed peptide, *J. Am. Chem. Soc.* **2007**, 129(48), 14844-14845.

Designed research, completed experiments, interpreted results, wrote and edited the majority of the paper.

13. K. L. Pankhurst, C. G. Mowat, E. L. Rothery, J. M. Hudson, A. K. Jones, C. S. Miles, M. D. Walkinshaw, F. A. Armstrong, G. A. Reid, and S. K. Chapman. A proton delivery pathway in the soluble fumarate reductase from *Shewanella frigidimarina*, *J. Biol. Chem.*, **2006**, 281(29), 20589-20597.

12. T. Burgdorf, O. Lenz, T. Buhrke, E. van der Linden, A. K. Jones, S. Albracht, and B. Friedrich. Functional modules of Aerotolerant [NiFe]-Hydrogenases in *Ralstonia eutropha* H16, *J. Mol. Microbiol. Biotechnol.*, **2005**, 10, 181-196.

11. G. Winter, T. Buhrke, O. Lenz, A. K. Jones, M. Forgber, and B. Friedrich. A model system for [NiFe]-hydrogenase maturation studies. Purification of an active site-containing hydrogenase large subunit without small subunit. *FEBS Lett.*, **2005**, 579(20), 4292-4296.

10. G. Winter, T. Buhrke, A. K. Jones, B. Friedrich. The role of the active-site coordinating cysteine residues in the maturation of the H₂-sensing [NiFe] hydrogenase from *Ralstonia eutropha* H16. *Arch. Microbiol.*, **2004**, 182(2-3), 138-146.

9. A.K. Jones, O. Lenz, A. Strack, T. Buhrke, and B. Friedrich. Hydrogenase active site biosynthesis: Identification of Hyp protein complexes in *Ralstonia eutropha*. *Biochemistry* **2004**, 43(42), 13467-13477.

8. A. K. Jones, S. E. Lamle, H. R. Pershad, K. A. Vincent, S. P. J. Albracht, and F. A. Armstrong. Enzyme electrokinetics: electrochemical studies of the anaerobic interconversions between active

and inactive states of *Allochromatium vinosum* [NiFe]-hydrogenase. *J. Am. Chem. Soc.* **2003**; 125(28), 8505-14.

7. C. Leger, S. J. Elliott, K. R. Hoke, L. J. C. Jeuken, A. K. Jones, and F. A. Armstrong. Enzyme electrokinetics: using protein film voltammetry to investigate redox enzymes and their mechanisms. *Biochemistry*; **2003**; 42(29), 8653-62.

6. C. Leger C, A. K. Jones, W. Roseboom, S. P. J. Albracht, and F. A. Armstrong. Enzyme electrokinetics: hydrogen evolution and oxidation by *Allochromatium vinosum* [NiFe]-hydrogenase. *Biochemistry*, **2002**; 41(52), 15736-46.

5. C. Leger, A. K. Jones, S. P. J. Albracht, and F. A. Armstrong. Effect of a Dispersion of Interfacial Electron Transfer Rates on Steady State Catalytic Electron Transport in [NiFe]-hydrogenase and Other Enzymes. *J. Phys. Chem. B.*, **2002**; 106(50); 13058-13063.

4. A. K. Jones, E. Sillery, S. P. J. Albracht, and F. A. Armstrong. Direct comparison of the electrocatalytic oxidation of hydrogen by an enzyme and a platinum catalyst. *Chem Commun*, **2002**; (8):866-7.

3. L. J. C. Jeuken, A. K. Jones, S. K. Chapman, G. Cecchini, and F. A. Armstrong. Electron-transfer mechanisms through biological redox chains in multicenter enzymes. *J Am Chem Soc.*, **2002**; 124(20):5702-13.

2. F. A. Armstrong, R. Camba, H. A. Heering, J. Hirst, L. J. C. Jeuken, A. K. Jones, C. Leger, and J. P. McEvoy. Fast voltammetric studies of the kinetics and energetics of coupled electron-transfer reactions in proteins. *Faraday Discuss.*, **2000**; (116):191-203; discussion 257-68.

1. A. K. Jones, R. Camba, G. A. Reid, S. K. Chapman, and F. A. Armstrong. Interruption and Time Resolution of Catalysis by a Flavoenzyme Using Fast Scan Protein Film Voltammetry. *J. Am. Chem. Soc.*, **1999**; 122(27): 6494-6495.

B. Commentaries

S. Roy and A. K. Jones*. Metalloenzymes: Cutting out the middleman. *Nature Chem. Biol.* **2013**, 9: 603-605, doi:10.1038/nchembio.1322

This is a commissioned commentary on primary research. Wrote and edited the article.

C. Manuscripts in Preparation (pre-prints available upon request)

34. S. G. Williams, J. Artz, D. Mulder, P. W. King, J. W. Peters, A. K. Jones*. Variation of Catalytic Bias in the [FeFe]-hydrogenases of *Clostridium pasteurianum*. To be submitted to *Angew. Chem. Int Edit*.

35. D. J. Martin, S. G. Williams, A. K. Jones, D. Barondeau. An [FeFe]-hydrogenase Biased to Hydrogen Oxidation. To be submitted to *Nature Chem. Biol*.

36. P. Kwan, C. L. McIntosh, D. P. Jennings, R. C. Hopkins, S. K. Chandrayan, C.-H. Wu, M. W. W. Adams, A. K. Jones*. Catalytic Bias of the Soluble Hydrogenase I from *Pyrococcus furiosus*. To be submitted to *Biochemistry*

37. K.-W. Jeon[†], J. A. Laureanti, A. K. Jones, D.-K. Seo,. Highly Conducting, Highly Thiol Functionalized Langmuir Blodgett Films of Reduced Graphene Oxide. To be submitted to *J. Am. Chem. Soc.*

38. J. A. Laureanti, T. L. Groy, A. Debnath, S. K. S. Mazinani[†], V. Mujica, A. K. Jones*. Hydrogen evolution from mono-Fe carbonyls with chelating bis-phosphine and benzene-1,2-dithiol as function [FeFe]-hydrogenase mimics. To be submitted to *Dalton Trans*.
39. A. Cereda, A. Hitchcock, J. Heap, R. Ros, T. S. Bibby, A. K. Jones*. Pili are not required for extracellular electron transfer by *Synechocystis* sp. PCC6803. To be submitted to *Appl. Env. Microbiol*.
40. J. A. Laureanti, C. Gisriel[†], K. E. Redding, A. K. Jones*. Photosynthetically driven bio-electrosynthesis of hydrogen using *Heliobacterium modesticaldum*. To be submitted to *Int. J. Hyd. Energy*.

E. Peer-reviewed Book Chapters

5. J. H. Artz, D. W. Mulder, S. Poudel, D. Colman, G. J. Schut, S. G. Williams, A. K. Jones, M. W. W. Adams, E. S. Boyd, P. W. King, J. W. Peters. Structure-Function of [FeFe]- and {NiFe}-Hydrogenases: An Overview of Diversity, Mechanism, Maturation, and Bifurcation, to appear in *Microalgal Hydrogen Production: Achievements and Prospectives*. Edited by M. Seibert, Roy. Soc. Chem. 2017 (*in review*)

This is a review article for which I contributed to discussions of [FeFe]- and [NiFe]-hydrogenase mechanism.

4. J. A. Laureanti and A. K. Jones*. Photosynthetic Microbial Fuel Cells, to appear in *Biophotoelectrochemistry: From bioelectrochemistry to biophotovoltaics*. Edited by L. Jeuken, Springer 2017 (*in press*).

This is a review article for which I did all of the writing and the majority of the editing. The J. A. Laureanti was involved in literature searching to identify relevant sources and preparation of figures.

3. A. K. Jones*, A. Debnath, L. Gan, D. Jennings, J. Laureanti. Biomimetic Complexes for the Production of Dihydrogen and Reduction of Carbon Dioxide. in "*Homo- and Heterobimetallic Complexes in Catalysis: Cooperative Catalysis*" in the Topic in Organometallic Chemistry series. Edited by P. Kalck, Springer 2015.

This is a review article for which I did all of the writing and the majority of the editing. The students and post-doc were involved in literature searching to identify relevant sources and preparation of figures.

2. A. K. Jones*, C. L. McIntosh, A. Dutta, P. Kwan, S. Roy, S. Yang. Bioelectrocatalysis of hydrogen oxidation and production. In *Enzymatic fuel cells: From fundamentals to applications*. Edited by H. Luckarift, G. Johnson and P. Attanasov, John Wiley and Sons, Inc. 2014.

This is a review article for which I did all of the writing and the majority of the editing. The students were involved in literature searching to identify relevant sources and preparation of

figures.

1. A. K. Jones, H. R. Pershad, B. Faber, S. P. J. Albracht, and F. A. Armstrong. The active/inactive interconversion of an [NiFe]-hydrogenase at an electrode. In *Hydrogen as a Fuel: Learning from Nature*. Edited by Cammack, R., Frey, M., Robson, R. London and New York: Taylor and Francis 2001: 88-92.

F. Non-reviewed popular science/outreach

1. A. K. Jones*, T. S. Bayer, T. S. Bibby, L. Cronin, J. Golbeck, D. M. Kramer, I. Matsumura, Plug and play photosynthesis, *Chemistry and Industry* 2012, issue 9, <http://www.soci.org/Chemistry-and-Industry/CnI-Data/2012/9/Plug-and-play-photosynthesis.aspx>.

This is a popular science hypothesis paper based on ideas developed by all of the co-authors. I wrote the first draft, coordinated and undertook major editing, and corresponded with the editor.

2. A. K. Jones, Interviewee featured in Microbeworld Podcast Episode 59, "Harvesting Excess energy from cyanobacteria": http://www.microbeworld.org/index.php?option=com_content&view=category&layout=blog&id=36&Itemid=146

Presentations

A. Oral Invited

The first author is the presenter unless otherwise indicated.

54. A. K. Jones, Renewable Energy: Storage and Solar Fuels, Durgapur Women's College, India, January 2017.

53. A. K. Jones, Defining Functional Diversity of Hydrogenase Electrochemically, Symposium on Advanced Biological Inorganic Chemistry, Kolkata, India, January 2017.

IC YOU (Inorganic Chemistry, Young, Outstands, and Upcoming) Symposium Lecture
Sponsored by the Journal Inorganic Chemistry

52. A. K. Jones, Reactivity of Soluble [NiFe]-hydrogenases, DOE Physical Biosciences PI Meeting, Maryland, October 2016.

51. A. K. Jones, Defining Functional Diversity of [FeFe]-hydrogenases electrochemically, Hydrogenase 2016, Marseille, France, July 2016.

50. A. K. Jones, Biological and Bio-Inspired Electrocatalysis: Solutions to Energy Challenges, Univ. California at Irvine, March 2016.
49. A. K. Jones, Biological and Bio-Inspired Electrocatalysis: Electrochemical Solutions to Energy Challenges, Montana State Univ., Dec 2015.
48. A. K. Jones, Plug-and-Play Photosynthesis, NSF Workshop Enhancing Photosynthesis, London, UK, November 2015.
47. A. K. Jones, DOE EFRC Meeting, Washington D. C., October 2015.
46. A. K. Jones, Reactivity of soluble [NiFe]-hydrogenases, Structure and Function of Hydrogenase Mimics, Telluride Science Workshop, July 2015.
45. A. K. Jones, Biological and Bio-Inspired Electrocatalysis: Electrochemical Solutions to Energy Challenges, Colloquium, Max Planck Institute Tuebingen, Germany, Feb 2015.
44. A. K. Jones, Defining the Catalytic Properties of Soluble [NiFe]-Hydrogenases Using Direct Electrochemistry, Metals in Biology Gordon Research Conference, California, 2015.
43. A. K. Jones, Photons to Fuel: Bio-Inspired Electrocatalysis and Artificial Photosynthesis, IméRA, Marseille, France, Oct. 2014.
42. A. K. Jones, Biological and Bio-Inspired Electrocatalysis: Electrochemical Solution to Energy Challenges, Colloquium, Emory University, Nov. 2014.
41. A. K. Jones, Electrochemical Mapping of Proteins and Pathways in *Synechocystis* sp. PCC6803, Photosynthesis Gordon Research Conference, Vermont, 2014.
40. A. K. Jones, Sequential Oxidations of the Thiolates and the Cobalt Metallocenter in a Synthetic Metallopeptide: Implications for the Biosynthesis of Nitrile Hydratase, IONiC Bioinorganic Workshop, Northwestern University, 2014.
39. A. K. Jones, Electrochemical Characteriation of the Oxygen-Tolerant Soluble Hydrogenase I from *Pyrococcus furiosus*. DOE Hydrogen Program Review, Washington D. C., 2014.
38. A. K. Jones, How do you make a redox enzyme run backwards? Defining the Catalytic Properties of Soluble [NiFe]-Hydrogenases Using Direct Electrochemistry, Chemistry and Biology Interface Seminar, University of Delaware, 2014.
37. A. K. Jones, How do you make a redox enzyme run backwards? Defining the Catalytic Properties of Soluble [NiFe]-Hydrogenases Using Direct Electrochemistry, Department of Chemistry and Biochemistry Colloquium, Utah State University, 2014.
36. A. K. Jones, "What Controls Bias in Redox Enzymes: Defining the Catalytic Properties of Soluble [NiFe]-hydrogenases using Direct Electrochemistry", Electrochemistry Gordon Research Conference, Ventura, CA 2014.

35. A. K. Jones, Fast and Efficient Hydrogen Production Catalysis: Incorporating Nature's Mechanisms into Inorganic Molecules, International Photosynthesis Congress, St. Louis, MO, 2013.
34. A. K. Jones, Defining Directionality and Aerotolerance of Soluble, Multimeric [NiFe]-hydrogenases, Enzymes, Coenzymes & Metabolic Pathways Gordon Research Conference, Waterville Valley, NH, 2013.
33. A. K. Jones, Artificial hydrogenases: Utilization of peptide and redox non-innocent ligands in [FeFe] and [NiFe] complexes, ACS Meeting, New Orleans, 2013.
32. A. K. Jones, Plug and Play Photosynthesis for RuBisCO independent fuels, NSF program review for Photosynthetic Ideas Lab, Washington, D. C., 2013.
31. A. K. Jones, Redox enzymes as electrocatalysts: exploration of natural and artificial hydrogenases, Department of Chemistry, California Institute of Technology, 2012.
30. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, Department of Chemistry, University of Glasgow, UK, 2012.
29. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, CEA Grenoble, France, 2012.
28. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, CNRS Marseilles, France, 2012.
27. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, University of Utah, 2012.
26. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, Texas A&M University, 2012.
25. A. K. Jones, Bioelectrocatalysis by bidirectional [NiFe]-hydrogenases: Mechanistic comparison to uptake enzymes, Symposium on Hydrogen production and applications, ACS Meeting, San Diego, 2012.
24. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, California State University at Fullerton, 2012.
23. A. K. Jones, Engineering oxidoreductases for electrocatalysis: understanding the roles of residues outside the active site in controlling catalysis by hydrogenases, University of Arizona, 2012.
22. A. K. Jones, Harvesting excess high energy electrons for food or fuel, American Academy for the Advancement of Science Symposium, Vancouver, Canada, 2012.
21. A. K. Jones, Redox Enzymes as Electrocatalysts: Exploration of Natural and Artificial Hydrogenases, University of Georgia, 2012.
20. A. K. Jones, Engineering oxidoreductases: understanding the roles of residues outside the active site in controlling catalysis by hydrogenases, Emory University, 2012.
19. A. K. Jones, Bio-inspired catalysts for hydrogen oxidation and evolution. 5th Sante Fe Workshop on Materials for Energy Conversion (Topic: Bioinspired catalysts for oxygen reduction), NM, 2011.

18. A. K. Jones, Artificial Hydrogenases: Construction of peptide models for [FeFe]-hydrogenases, Main Group Chemistry Symposium, Southwest regional ACS meeting, Austin, TX, 2011.
17. A. K. Jones, Engineering oxidoreductases: understanding the roles of residues outside the active site in controlling catalysis by hydrogenases, Boston University, 2011.
16. A. K. Jones, Redox enzymes as electrocatalysts: exploration of natural and artificial hydrogenases, University of New Mexico, 2011.
15. A. K. Jones, Artificial [FeFe] hydrogenase: modifications of amino acids to create ligands for binding diiron clusters, AFOSR Bioenergy Annual Review, Washington, D. C., 2011.
14. G. Ghirlanda and A. K. Jones, Design of peptide-based catalysts: development of artificial hydrogenases, EFRC Forum, Washington, D. C., 2011.
* Joint presentation by both investigators.
13. A. K. Jones, Direct electrochemistry of the bidirectional [NiFe]-hydrogenase from *Synechocystis*, University of Southern California, 2010.
12. A. K. Jones, Exploring and Exploiting Redox Enzymes, Department of Chemistry Seminar Series, University of Nevada at Reno, 2010.
11. A. K. Jones, Engineering Oxidoreductases: Design and Synthesis of Artificial Hydrogenases, Air Force Office of Scientific Research Annual Program Review, Arlington, VA, July 2010.
10. A. K. Jones, Design and Synthesis of artificial hydrogenases. Bioenergetics symposium of the Biophysical Society Meeting, San Francisco, CA, 2010.
9. A. Dutta, A. K. Jones, Synthesis of [NiFe]-hydrogenase maquettes: a bottom-up approach for studying metalloenzymes, Graduate Research Symposium of the Metals in Biology Gordon Research Conference, Ventura, CA, USA, 2010.
8. A. K. Jones, Engineering oxidoreductases: Design and Synthesis of Artificial Hydrogenases, Air Force Office of Scientific Research Annual Program Review, Arlington, VA, 2009.
7. A. K. Jones, Exploring and Exploiting Redox Enzymes, Department of Civil, Environmental and Sustainable Engineering, Arizona State University, Tempe, AZ, 2009.
6. A. K. Jones, Exploring and Exploiting Redox Enzymes, Department of Chemistry Seminar Series, Regis College, Denver, CO, 2009.
5. A. K. Jones, Artificial Redox Enzymes, Minisymposium on redox enzymes, University of Pennsylvania School of Medicine, Philadelphia, PA, 2008.
4. A. K. Jones, Design and Synthesis of Artificial Hydrogenases. Fe-S Enzymes Gordon Research Conference, Colby-Sawyer College, New London, NH, 2008.
3. A. K. Jones, Hydrogenases: Model Redox Enzymes, Biophysics Chalk Talk, ASU, Tempe, AZ, 2008.
2. A. K. Jones, Exploring and Exploiting Redox Enzymes. Fort Lewis College, Durango, CO, 2007.
1. A. K. Jones, B. M. Discher, R. L. Koder, C. M. Moser, and P. L. Dutton, De novo design of Redox Enzymes, Monte Verita, Switzerland, 2006.

B. Oral Submitted

The first author is the presenter unless otherwise indicated.

15. S. Garrett Williams, A. K. Jones, Investigation of Catalytic Bias in [FeFe]-hydrogenases, Penn State Bioinorganic Chemistry Workshop, July 2016.
14. D. Jennings, A. K. Jones, Electrocatalysis by a Bifurcating Transhydrogenase, ACS National Meeting, March 2016.
13. J. A. Laureanti, C. Gisriel, K. Redding, A. K. Jones, Photo-electrochemical Hydrogen Production by *Heliobacterium modesticaldum*. Western Regional Photosynthesis Meeting, Jan 2016.
12. A. K. Jones, L. Gan, S. Roy, S. Mazinani, P. Tarakeshwar, V. Mujica, T. Groy, Biomimetic Models of Hydrogenases: Impact of Redox-Active Ligands, International Conference of Bioinorganic Chemistry, Grenoble, France, 2013.
11. A. K. Jones, Defining Directionality and Aerotolerance in Soluble, Biodirectional [NiFe]-hydrogenases using Protein Film Electrochemistry, International Hydrogenase Conference, Szeged, Hungary, 2013.
10. A. K. Jones, Fast and Efficient hydrogen production catalysis via a bio-inspired [NiFe] coordination complex, EFRC Symposium, Washington D. C., 2013.
9. S. Roy, A. K. Jones, Artificial [FeFe]-Hydrogenases: Synthesis and Characterization of Diiron-polycarbonyl Clusters in Peptide Scaffolds Using Artificial Amino Acids. Organometallic Chemistry Gordon Research Symposium, Rhode Island, 2012.
8. A. Dutta, G. Kodis, T. Groy, A. K. Jones. Photoactive, sulfur bridged, intramolecular [NiRu(bpy)₂] dyads for artificial photosynthesis: Comparison of coordination by peptide or a small tetradentate ligand. Renewable Energy: Solar Fuels Gordon Research Symposium, Tuscany, Italy, 2012.
7. A. K. Jones, Artificial hydrogenases: Construction of peptide based models of hydrogenases. 9th International Hydrogenase Conference. Uppsala, Sweden. 2010.
6. A. Dutta, A. K. Jones, Synthesis of [NiFe]-hydrogenase maquettes: a bottom-up approach for studying metalloenzymes, Symposium on Research in Interdisciplinary Science & Engineering, ASU, Tempe, AZ 2008.
5. C. McIntosh, J. Cordova[†], G. Ghirlanda, A. K. Jones. Electrocatalytic reduction of carbon dioxide by an artificial transmembrane protein, Symposium on Research in Interdisciplinary Science & Engineering, ASU, Tempe, AZ, 2008.
4. Nicholas Teodori, A. K. Jones. Modeling of [FeFe]-hydrogenases via artificial peptides, Symposium on Research in Interdisciplinary Science & Engineering, ASU, Tempe, AZ, 2008.
3. A. Dutta, A. K. Jones. Synthesis of hydrogenase maquettes: Bottom-up approach for studying metalloenzymes. Life and Earth Sciences Graduate Symposium, ASU, Tempe, AZ, USA, 2008.
2. C. McIntosh, J. Cordova[†], G. Ghirlanda, A. K. Jones. Generation of a transmembrane catalyst for efficient carbon dioxide (CO₂) electroreduction. Life and Earth Sciences Graduate Symposium, ASU, Tempe, AZ, USA, 2008.
1. A. K. Jones, B. R. Lichtenstein, P. L. Dutton. Synthetic hydrogenases: Incorporation of an iron carbonyl thiolate into a designed peptide. 13th International Conference on Biological Inorganic Chemistry, Vienna, Austria, 2007.

C. Posters Submitted

The first author is the presenter unless otherwise indicated.

40. S. G. Williams, J. Artz, S. Poudel, D. Mulder, M. Ratzloff, P. King, E. Boyd, J. Peters, A. K. Jones*. Electrochemical Comparison of the [FeFe]-hydrogenases from *Clostridium pasteurianum*. Metals in Biology Gordon Research Conference, Ventura, CA, 2017.

39. M. A. Thirumurthy, A. K. Jones*. Assembly of Redox Proteins into Supramolecular Nanofibers. Penn State Bioinorganic Workshop, 2016.

38. S. G. Williams, J. Artz, D. Mulder, P. King, J. Peters, A. K. Jones*. Insights into the determinants of catalytic bias using protein film electrochemistry. DOE EFRC Meeting, Washington D. C., 2015.

37. J. Laureanti, C. Gisriel[†], D. Ki, S. Popat, K. E. Redding, A. K. Jones*. Photosynthetically Driven Electrosynthesis of Hydrogen by *Heliobacterium modesticaldum*. ISMET 2015, Tempe, AZ 2015.

36. A. K. Jones, P. Kwan, C. McIntosh, R. C. Hopkins, M. W. W. Adams. Electrochemical Characterization of the Oxygen-tolerant Soluble Hydrogenase I from *Pyrococcus furiosus*. DOE Physical Biosciences PI Meetings, Anapolis, MD, 2014.

35. A. K. Jones*, S. Roy, L. Gan, S. K. Mazinani[†], T. L. Groy, P. Tarakeshwar, V. Mujica. Artificial Hydrogenases: Utilization of Redox Non-Innocent Ligands in Iron Complexes for Hydrogen Production, DOE Hydrogen Program Review, Washington, D.C., 2014.

34. S. Roy, L. Gan, T. L. Groy, S. Mazinani[†], P. Tarakeshwar, V. Mujica, A. K. Jones* Fast and Efficient Hydrogen Production Catalysis: Incorporating Nature's Mechanisms into Inorganic Molecules, Scialog Conference, Tucson, AZ 2013 (Jones as Presenter).

33. P. J. Robbins, A. Hitchcock, A. Cereda, T. S. Bibby, A. K. Jones, L. Cronin, A Design Approach to Modular Biophotovoltaic Fuel Cells, International Photosynthesis Congress, St. Louis, MO, 2013.

32. A. Hitchcock, A. Cereda, A. K. Jones, T. S. Bibby. A biophotovoltaic approach to understanding extracellular electron transport by *Synechocystis* sp. PCC6803. Cyanobacteria Meeting, St. Louis, MO, 2013.

31. A. Cereda, A. Hitchcock, T. S. Bibby, A. K. Jones. A biophotovoltaic approach to mapping extracellular electron transfer by *Synechocystis* sp. PCC6803, International Photosynthesis Congress, St. Louis, MO, 2013.

30. S. Roy, T. L. Groy, A. K. Jones. Electrocatalytic hydrogen production by functional models of [FeFe]-hydrogenase with redox non-innocent ligands. International Conference of Biological Inorganic Chemistry, Grenoble, France, 2013.

29. P. Kwan, C McIntosh, R. C. Hopkins, M. W. W. Adams, A. K. Jones. Characterization of the soluble [NiFe]-hydrogenase from *PfSHI* using protein film electrochemistry. International Hydrogenase Conference, Szeged, Hungary, 2013.
28. L. Gan, T. L. Groy, A. K. Jones. Hydrogen generation catalysis by a [NiFe] phosphine complex including a redox noninnocent ligand. Metals in Biology Gordon Research Symposium, Ventura, California, 2013.
27. A. Hitchcock, A. Cereda, M. Symes, C. Busche, J. Heap, T. Bayer, L. Cronin, T. Bibby, A. K. Jones. Plug and Play Photosynthesis: Developing electrochemical screens to understand exoelectrogenic activity in cyanobacteria, European Solar Fuels Conference, Glasgow, Scotland, 2012.
26. S. Roy, A. K. Jones, Artificial [FeFe]-Hydrogenases: Synthesis and Characterization of Diiron-polycarbonyl Clusters in Peptide Scaffolds Using Artificial Amino Acids. Organometallic Chemistry Gordon Research Symposium, Rhode Island, 2012.
25. A. Dutta, G. Kodis, T. Groy, A. K. Jones, Photoactive, sulfur bridged, intramolecular [NiRu(bpy)₂] dyads for artificial photosynthesis: Comparison of coordination by peptide or a small tetradentate ligand. Renewable Energy: Solar Fuels Gordon Research Conference, Tuscany, Italy, 2012.
24. C. McIntosh, R. C. Hopkins, F. Germer, R. Schulz, J. Appel, M. W. W. Adams, A. K. Jones, Characterization of oxygen tolerance of bidirectional [NiFe]-hydrogenases by protein film electrochemistry. Metals in Biology Gordon Research Conference, Ventura, CA 2012.
- Presented by A. K. Jones
23. Cowgill, J.[†] Ashur, I., Jones A. K., and Redding, K. Characterization of the Fx FeS cluster in the *Heliobacter* reaction center, Western Regional Photosynthesis Conferences, CA, 2011.
22. C. McIntosh, F. Germer, J. Appel, A. K. Jones. Hydrogenases in phototrophs: Characterization of the bidirectional [NiFe]-hydrogenase from *Synechocystis* sp. PCC 6803 using protein film electrochemistry. International Conference of Bioinorganic Chemistry. Vancouver, Canada. 2011.
21. A. Dutta, A. K. Jones. Modeling [NiFe]-hydrogenase: development of a synthetic methodology for construction of heterometallic complexes in a peptide scaffold. International Conference of Bioinorganic Chemistry. Vancouver, Canada. 2011.
- This poster was awarded a conference poster prize (to A. Dutta).
20. S. Roy, S. Yang, S. Shinde[†], G. A. Hamilton, H. Hartnett, A. K. Jones. Artificial hydrogenases: construction of peptide models of [FeFe]-hydrogenases. International Conference of Bioinorganic Chemistry. Vancouver, Canada. 2011.
19. C. L. McIntosh, F. Germer, J. Appel, A. K. Jones. Hydrogenases in phototrophs: Characterization of the bidirectional [NiFe]-hydrogenase from *Synechocystis* sp. PCC 6803 using protein film electrochemistry. Metals in Biology Gordon Research Conference. Ventura, CA, USA. 2011.
18. S. Roy, S. Shinde[†], A. K. Jones. Artificial [FeFe]-hydrogenase: Synthesis of a diiron-hexacarbonyl cluster in a peptide framework. 9th International Hydrogenase Conference. Uppsala, Sweden. 2010.

17. C. L. McIntosh, F. Germer, J. Appel, A. K. Jones. Characterization of the bidirectional [NiFe]-hydrogenase from *Synechocystis* sp. PCC6803 using protein film electrochemistry. 9th International Hydrogenase Conference. Uppsala, Sweden. 2010.
16. A. Dutta, A. Hamilton[†], H. E. Hartnett, A. K. Jones. Synthesis of [Ni-M_x] complexes in a peptide scaffold: Biomimetic peptidic models of [NiFe]-hydrogenases. 9th International Hydrogenase Conference. Uppsala, Sweden. 2010.
15. A. K. Jones, A. Dutta, S. Roy, N. Teodori. Synthesis of Hydrogenase maquettes: a bottom-up approach for studying metalloenzymes. Fe-S enzymes Gordon Research Conference, Colby-Sawyer College, NH, USA, 2010.
14. A. K. Jones, B. Kearnl, I. Ashur, A. Dutta, C. L. McIntosh, Identification of an indium tin oxide binding peptide and its use in electrochemical applications, Electrochemistry Gordon Research Conference, Ventura, CA USA, 2010.
13. A. Dutta, A. K. Jones, Synthesis of [NiFe]-hydrogenase maquettes: a bottom-up approach for studying metalloenzymes, Graduate Research Symposium of the Metals in Biology Gordon Research Conference, Ventura, CA, USA, 2010.
12. A. Dutta, A. K. Jones, Synthesis of peptide based [Ni-Fe] hydrogenase: A bottom-up approach for studying metalloenzymes, Gordon Research Conference Renewable Energy: Solar Fuels, Ventura, CA, USA, 2009.
11. A. K. Jones, B. Kearnl, A. Dutta, C. McIntosh. Identification of an Indium Tin Oxide binding peptide for use as an affinity tag in direct protein electrochemistry. Metals in Biology Gordon Conference, Ventura, CA, USA, 2009.
10. B. Kearnl, A. K. Jones, Identification of an indium tin oxide binding peptide for use as an affinity tag in direct protein electrochemistry, Symposium on Research in Interdisciplinary Science & Engineering, ASU, Tempe, AZ, USA, 2008.
9. A. K. Jones, B. R. Lichtenstein, A. Dutta, G. Gordon, P. L. Dutton. Synthetic hydrogenases: Incorporation of an iron carbonyl thiolate into a designed peptide. Metals in Biology Gordon Conference, Ventura, CA, USA, 2008.
8. C.-P. Hung, P. L. Dutton, and A. K. Jones. Synthetic hydrogenases: Synthesis of a dithiol amino acid as an anchor for bimetallic clusters in peptides. 8th International Hydrogenase conference, Breckenridge, CO, USA, 2007.
7. A. K. Jones, B. R. Lichtenstein, P. L. Dutton. Synthetic hydrogenases: Incorporation of an iron carbonyl thiolate into a designed peptide. 8th International Hydrogenase conference, Breckenridge, CO, USA, 2007.
6. A. K. Jones, O. Lenz, A. Strack, T. Buhcke, and B. Friedrich. NiFe hydrogenase active site biosynthesis: Hyp protein complexes in *Ralstonia eutropha*. 7th International Hydrogenase conference, Reading, UK, 2004.
5. A. K. Jones, H. R. Pershad, E. Sillery, S. P. J. Albracht, and F. A. Armstrong. Insights into the catalytic cycle of [NiFe]-hydrogenases from direct electrochemistry. 10th International Conference on Bioinorganic Chemistry, Florence, Italy, 2001.
4. A. K. Jones, H. R. Pershad, B. Faber, S. P. J. Albracht, and F. A. Armstrong. The active/inactive interconversion of a [NiFe]-hydrogenase at an electrode. 6th International Conference on the Molecular Biology of Hydrogenases, Potsdam, Germany, 2000.

3. A. K. Jones, H. R. Pershad, B. Faber, S. P. J. Albracht, and F. A. Armstrong. The active/inactive interconversion of a [NiFe]-hydrogenase at an electrode. EUROBIC, Toulouse, France, 2000.
2. F. A. Armstrong, R. Camba, J. Hirst, A. K. Jones, and J. P. McEvoy. Applications of fast scan protein film voltammetry to examine the coupling and gating of electron transfer at active sites. 219th ACS National Meeting, San Francisco, CA, 2000.
1. A. K. Jones, K. Turner, S. K. Chapman, and F. Armstrong. Detection of transient intermediates in flavoenzyme reactions: interruption of the catalytic cycle of flavocytochrome c_3 from *Shewanella frigidimarina* using protein film voltammetry. 9th International Conference on Bioinorganic Chemistry, Minneapolis, MN, 1999.

Teaching and Mentoring

A. COURSES TAUGHT

(8 different courses at ASU both on ground and online)

Year	Term	Title (course listing)
2017	Spring	Writing for Chemists (CHM 598/BCH 598)
2016	Fall	General Chemistry I (CHM 113) (developed new online course; co-taught with T. Windman) General Chemistry II (CHM 116) (developed new online course, co-taught with G. Cabirac)
2016	Spring	Bioinorganic Chemistry (CHM598/BCH598/CHM494)
2015	Fall	Approved Administrative Teaching Release Special Topics in Inorganic Chemistry (CHM501)
2015	Spring	Sabbatical
2014	Fall	Sabbatical
2014	Spring	Writing for Chemistry (CHM598/BCH598)
2013	Fall	Inorganic Chemistry (CHM453) Special Topics in Inorganic Chemistry (CHM501)
2013	Spring	Bioinorganic Chemistry (CHM598/BCH598/CHM494)
2012	Fall	Inorganic Chemistry (CHM453)
2012	Spring	Approved release from teaching before tenure
2011	Fall	Inorganic Chemistry (CHM453) Special Topics in Inorganic Chemistry (CHM501)
2011	Spring	Special Topics in Chemical Sustainability (CHM494)
2010	Fall	Bioinorganic Chemistry (CHM598/BCH598)
2010	Spring	Special Topics in Chemical Sustainability (CHM494) Special Topics in Inorganic Chemistry (CHM501)
2009	Fall	Inorganic Chemistry (CHM453) Special Topics in Chemical Sustainability (CHM494)
2009	Spring	Inorganic Chemistry Laboratory (CHM452)
2008	Fall	Approved release from teaching for Family Medical Leave

2008	Spring	Approved Release from Teaching before tenure Special Topics in Inorganic Chemistry (CHM501)
2007	Fall	Bioinorganic Chemistry (CHM598/BCH598)
2007	Spring	Inorganic Chemistry (CHM453)

Other Teaching Activities:

Guest Lecturer. Molecular Mechanisms of Photosynthesis (BCH568). Title: Phototrophs and Hydrogen metabolism.

Guest Lecturer. Fundamentals of Biological Design I (BDE701). Title: Microbial hydrogen production and utilization.

B. RESEARCH MENTORING

Visiting Scientist

John Freeman (2009, Sabbatical from East Stroudsburg College)

Postdoctoral Researchers (5 total)

Idan Ashur (2009-2013)
Angelo Cereda (2011-2014)
Lu Gan (2011-2015)
Zahra Nazemi (2015-present)
Christina Forbes (2016- present)

Graduate Students- Committee Chair (8 total)

David Jennings, Ph. D. in Chemistry, in progress
Joseph Laureanti, Ph.D. in Biochemistry, in progress
Miyuki Thirumurthy, Ph. D. in Biochemistry, in progress
S. Garrett Williams, Ph. D. in Chemistry, in progress

Patrick Kwan, Ph.D. in Biochemistry, completed 11/2014, "The Investigation and Characterization of Redox Enzymes Using Protein Film Electrochemistry"
Souvik Roy, Ph.D. in Chemistry, completed 9/2013, "Biomimetic Models of [FeFe]-hydrogenase: Utilization of peptides and redox non-innocent ligands in synthetic catalysts"
Arnab Dutta, Ph.D. in Chemistry, completed 10/2012, "Reactivity of Metal (Co, Ni, Cu) Bound Peptides with Organometallic Fragments and Small Molecules"
Chelsea McIntosh, Ph.D. in Biochemistry, completed, 4/2012, "Investigation and characterization of group 3 [NiFe]-hydrogenases using protein film electrochemistry (PFE): insights into catalytic bias and O₂-tolerance"

Graduate Students- Member of Advisory Committee (26 total)

In progress:

Grayson Boyer, Ph.D. in Chemistry
Yinnan Chen, Ph. D. in Biochemistry
Angela Edwards, Ph.D. in Biochemistry
Eduardo Espiritu, Ph.D. in Biochemistry
Christopher Gisriel, Ph. D. in Biochemistry
William Johnson, Ph. D. in Biochemistry
Andrey Kanygin, Ph. D. in Biochemistry
Joshua Nye, Ph. D. in Chemistry

2016

Dustin Rand, M Sc. in Biochemistry

2015

Ipsita Dutta, Ph.D. in Molecular Biology
Trevor Kashey, Ph.D. in Biochemistry
Shobeir K. S. Mazinani, Ph. D. in Chemistry

2014

Basab Roy, Ph.D. in Biochemistry
Michael Vaughn, Ph.D. in Biochemistry
Robert Schmitz, Ph.D. in Chemistry
Christopher Starr, M.S. in Chemistry
Andrew Brown, Ph.D. in Biochemistry

2013

Kiwan Jeon, Ph.D. in Chemistry
Keira Reifschneider, Ph. D. in Biochemistry

2012

Christopher Madden, Ph.D. in Biochemistry
John Cowgill, M.S. in Biochemistry

2011

Jennifer Glass, Ph.D. in Geological Sciences
Jennifer L. Morgan, Ph.D. in Chemistry

2010

Sara Bowen, Ph.D. in Chemistry
James Jursich, M.S. in Biochemistry
Michelle Meighan, Ph.D. in Chemistry
Aaron Tufts, Ph.D. in Biochemistry

2009

Lijing Jiang, M.S. in Biochemistry
Lingyan Song, Ph.D. in Chemical Engineering

2008

Michael Hambourger, Ph.D. in Chemistry

Graduate Students- Member of Oral Exam Committee (19 total; chair 7)

2015

Shaojiang Chen

2014

Chandrani Ghosh

Dayna Peterson (Chair)

Anna Beiler

2013

Tufan Mukhopadhyay

Dayna Peterson (Chair)

2012

Saikat Manna (Chair)

Rajeev Ranjan

Lina Franco

2011

Dongran Han (Chair)

Sriloy Dey (Chair)

2009

Rajiv Luthra

John Benedet (Chair)

2007

Yang Li

Xiaodong Qi

Yang Wu (Chair)

Tracy Niday

Janelle Jenkins (Chair)

Yinan Liu

Graduate Students- Other

Abhishek Debnath, Ph. D. in Chemistry (Committee chair 2013-2014)

Sijie Yang, Ph.D. in Chemistry (Committee chair 2010-2012)

Chen-pei Hung, Ph.D. in Biochemistry (Committee chair 2007-2009)

Anindya Roy, Ph. D. in Chemistry (Committee Member)

Lina Franco, Ph. D. in Biochemistry (Committee Member)

Undergraduate Students (Total: 18; Honors Thesis Committees: 6)

Honors Theses (Chaired):

1. Bryant Kearn (HT 2009) "Identification of an indium tin oxide binding peptide and its use in electrochemical applications"
2. Susan Qualls (HT 2011) "Purification and Electrochemical Characterization of a Variant Azurin Designed to Facilitate Stable Interactions with Indium Tin Oxide"

3. Julian Reed (HT 2011) “Comprehensive Alanine Screening of and Indium Tin Oxide Binding Peptide”

Honors Theses (Committee Member)

3. Alec Smith (2017, Director Prof. Kevin Redding)

2. Tyler M. Porter (2014, Director Prof. Ryan Trovitch)

1. Brandon Jones (2010, Director Prof. Mark Hayes)

Undergraduate Research Students:

2017

Arianne Zaiyani (Jan 2015-present)

Amity Jackson (Jan 2017- present)

2016

Arianne Zaiyani (Jan 2015-present)

Ejona Rapaj (Jan 2016-May 2016)

2015

Jeremy Strong (July 2014-May 2015)

Arianne Zaiyani (Jan 2015-present)

2014

Jeremy Strong (July 2014-Dec 2014)

2013

John Collins (Jan 2013-Dec 2013)

Clara Karches (Exchange student from Mainz, August 2012-Feb 2013)

Adam Woodard (Sept 2012-May 2013)

2012

Britton Carter (March 2012-Dec 2012)

Clara Karches (Exchange student from Mainz, August 2012-Feb 2013)

Thuy-Ai Nguyen (Jan 2011-May 2012)

Adam Woodard (Sept 2012-present)

2011

Daniel Duan (May 2010- May 2011)

Amron Harper (Sept 2011-Dec 2011)

Johannes Nagel (exchange student from Mainz, Sept. 2010-Feb 2011)

Thuy-Ai Nguyen (Jan 2011-May 2012)

Julian Reed (HT, 2011; May 2009-May 2011)

Susan Qualls (HT, 2011; August 2009-May 2011)

2010

Daniel Duan (May 2010- May 2011)

Logan Koehler (April 2009-May 2010)

Susan Qualls (HT, 2011; August 2009-May 2011)

Johannes Nagel (exchange student from Mainz, Sept. 2010-Feb 2011)

Julian Reed (HT, 2011; May 2009-May 2011)

Robert Steele (May 2010-Dec. 2010)
Daniel Taylor (Summer 2010)

2009

Bryant Kearn (HT 2009; Jan 2008-May 2009)
Logan Koehler (April 2009-May 2010)
Susan Qualls (HT, 2011; August 2009-May 2011)
Julian Reed (HT, 2011; May 2009-May 2011)
Jason Yates (May 2009-August 2009)

2008

Bryant Kearn (HT 2009; Jan 2008-May 2009)
Nathan Sylvain (Aug 2007-May 2008)
Nicholas Teodori (Jan 2007-May 2008)
Loreth Vergara (Aug 2008-Dec 2008)

2007

Nathan Sylvain (Aug 2007-May 2008)
Nicholas Teodori (Jan 2007-May 2008)

High School Teachers

Lisa Tozzi (Summer 2009, Chemistry, Mesa School District)
Janin Polcovich (Summer 2009, Biology, Tolleson District)

Service (selected)

A. University and Department Service

Associate Director of Academic Affairs for the School of Molecular Sciences (2015-present)

This position includes management of the unit's graduate and undergraduate programs. Particular initiatives include redesign of the first year programs both to be more effective in preparing majors and to create online courses. Also actively involved in design and implementation of activities to improve undergraduate student recruitment, retention and success. In calendar year 2016, my largest projects have involved implementing a new online Biochemistry degree (seeking university permissions, planning courses and instructors). In the context of that initiative, I have also developed and taught two new online chemistry courses: CHM 113 (General Chemistry I) and CHM 116 (General Chemistry II).

SMS/ Department of Chemistry and Biochemistry Undergraduate Studies Committee (2012-present)

SMS Committee on Assessment and Accreditation (2015-present)

SMS Liaison to the State and Regional Articulation Task Forces (2015-present)

Center for Bioenergy and Photosynthesis Finance Committee (chair 2013-2014; member 2016-present)

Department of Chemistry and Biochemistry Personnel Committee (2013-2014)

Committee for Strategic Planning for Center for Bioenergy and Photosynthesis (Sept. 2007-2014)

Department of Chemistry and Biochemistry Seminar Committee (2008-2015)
Barrett, the Honors College Disciplinary Advisor for Chemistry and Biochemistry (2009-2014)
Department of Chemistry and Biochemistry Septennial Review Committee (2012-2013)
Chair Strategic Planning Committee: Chemistry of Global Sustainability (2007-2008)

Search Committees:

Theory of Catalysis and Interfaces faculty search committee (Chair, 2016-2017)
School of Molecular Sciences Director Search (2015)
College of Liberal Arts and Science Search Committee for College Dean (2011)
Energy/ Inorganic Chemistry faculty search committee (2010-2011)
Biochemistry NMR faculty search committee (2009-2010)
Chemical Education faculty search committee (2008-2009)
Biochemistry NMR faculty search committee (2007-2008)

Scholarships Applicant Preparation/Selection:

ASU Selection Committee for Goldwater, Rhodes and Marshall Scholarships (2015-present)

ASU Selection Committee for Churchill Scholarship (2013) ASU Mock Interviewer for
University's Rhodes and Marshall Scholarship Candidates (2007-2009, 2013)
Scientific Reviewer for Maher Cancer Scholarship (2007)

Panelist for OKED Panel for New Researchers: How to Develop a Research Portfolio (Jan 2016)

B. Professional Service

DOE Advisory Roundtable and Report: Energy Efficient Activation of Nitrogen and Synthesis of Ammonia, 2016. The report produced by this panel can be found here:
<https://science.energy.gov/~media/bes/pdf/reports/2016/SustainableAmmoniaReport.pdf>

Review of Manuscripts for *ACS Catalysis*, *ACS Nano*, *Analytical Chemistry*, *Angewandte Chemie (Int. Ed.)*, *Biochemistry*, *BMC Microbiology*, *Chemical Communications*, *ChemBioChem*, *European Journal of Inorganic Chemistry*, *Journal of the American Chemical Society*, *Journal of Biological Inorganic Chemistry*, *Chemical Reviews*, *Dalton Transactions*, *Electrochemistry Communications*, *Langmuir*, *Journal of Electroanalytical Chemistry*, *Journal of Physical Chemistry*, *Nature Chemical Biology*, *Organometallics*, *Physical Chemistry Chemical Physics*, *Plos One*, *Science*

Review of grant proposals for

NSF (panel, winter 2015, winter 2016, winter 2017)
DOE Basic Energy Sciences (ad hoc review, panelist 2013, panelist 2017)
NSF (ad hoc review, 2014)
Petroleum Research Fund (ad hoc review, 2014)
Scientific Research Support Fund, Jordan (ad hoc review, 2014)
Biotechnology and Biological Sciences Research Council(BBSRC, UK) (ad hoc review, 2013)
Agence Nationale De Le Recherche (France) (ad hoc review, 2013)
SLAC National Accelerator Laboratory (ad hoc review, 2013)
ARPA-E (panelist, 2011, 2012)
U.S. Army Corps of Engineers' Engineer Research and Development Center (ad hoc review)
Global Climate and Energy Project (ad hoc review, 2011, 2013)
Air Force Office of Scientific Research (ad hoc review)

Indo-US Science & Technology Forum (ad hoc review)

American Chemical Society National Awards Committee Member (2015-present)

Panelist for ACS on Campus (Career Pathways Panel) (2013)

C. Extramural /Community Service

District 16 (Arizona and Southern California) Rhodes Scholarship Selection Committee (2009, 2010)

D. Professional Membership

Member of the American Chemical Society