

Curriculum vitae

Saroj Poudel

*Postdoctoral Associate, Department of Marine and Coastal
Sciences*

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Employments

- 2018-present Postdoctoral Associate, Department of Marine and Coastal Sciences, Rutgers, The State University of New Jersey, New Brunswick, New Jersey, USA.
Advisor: Dr. Vikas Nanda and Dr. Paul Falkowski
- 2015-2018 Graduate Research Assistant, Department of Microbiology and Immunology, Montana State University, Bozeman, Montana, USA. Advisor: Dr. Eric S. Boyd
- 2013-2014 Graduate Research Assistant, Department of Plant Sciences and Plant Pathology, Montana State University, Bozeman, Montana, USA. Advisor: Dr. Chaofu Lu
- 2012 Undergraduate Research Assistant, Department of Molecular Biology, Wyoming State Veterinary Laboratory, University of Wyoming, Laramie, Wyoming, USA.
Advisor: Dr. Jeffery J. Adamovicz
- 2008 Physics Lab Assistant, Department of Physics and Astronomy, University of Wyoming, Laramie, Wyoming, USA. Advisor: Dr. WenYong Wang

Education

- 2015-2018 Ph.D., Microbiology, Montana State University, Bozeman, Montana, USA.
Advisor: Dr. Eric S. Boyd
- 2013-2014 M.S., Computer Science, Department of Computer Science, Montana State University, Bozeman, Montana, USA. Advisor: Dr. Brendan Mumeey
- 2008-2012 B.S. (Hons.), Molecular Biology, University of Wyoming, Laramie, Wyoming, USA.

Awards and Fellowships

- 2020 NASA Postdoctoral Fellowship, NASA Astrobiology Institute
- 2019 Peggy Cotter Travel Awards for Early Career Branch Members, American Society for Microbiology.
- 2018-present Postdoctoral Fellowship. Institute of Earth, Ocean, and Atmospheric Sciences, Rutgers, The State University of New Jersey, New Brunswick, NJ.
- 2017-2018 The Beverly Ferguson Graduate Student Award. Montana State University.
- 2008-2012 Peak Achievement Scholarship. University of Wyoming. Awarded five times
- 2011-2012 Watt, Joe & Arlene Agriculture Scholarship. University of Wyoming. Awarded two times
- 2009-2012 UW Honors Scholar Stipend. University of Wyoming. Awarded four

2009, 2011 Dr. Scholl Honors Scholarship. University of Wyoming. Awarded two times
 2010, 2011 Amanda and Oscar Schmale Agriculture Scholarship. University of Wyoming.
Awarded two times
 2009,2010 Dean's and freshman honor rolls. University of Wyoming. Awarded two times

Peer Reviewed Publications or Book Chapters (In Prep/Press/Published)

20. Boyd, E.S., Amenabar, M.A., **Poudel, S.**, and Templeton, A.S. 2019. Bioenergetic constraints on the origin of autotrophic life. *Philosophical Transactions of the Royal Society* *In press*.
19. Mutter, A.C., Tyryshkin, A.M., Campbell, I.J., **Poudel, S.**, Bennett, G.N., Silberg, J.J., Nanda, V. and Falkowski, P.G., 2019. De novo design of symmetric ferredoxins that shuttle electrons in vivo. *Proceedings of the National Academy of Sciences*, 116(29), pp.14557-14562.
18. Fones, E.M., Colman, D.R., Kraus, E.A., Nothaft, D.B., **Poudel, S.**, Rempfert, K.R., Spear, J.R., Templeton, A.S. and Boyd, E.S., 2019. Physiological adaptations to serpentinization in the Samail Ophiolite, Oman. *The ISME journal*, p.1.
17. **Poudel, S.**, Dunham, E., Lindsay, M., Amenabar, M., Fones, E., Colman, D. and Boyd, E., 2018. Origin and Evolution of Flavin-Based Electron Bifurcating Enzymes. *Frontiers in Microbiology*, 9, p.1762.
16. Fixen, K.R., Chowdhury, N.P., Martinez - Perez, M., **Poudel, S.**, Boyd, E.S. and Harwood, C.S., 2018. The path of electron transfer to nitrogenase in a phototrophic alpha - proteobacterium. *Environmental microbiology*.
15. **Poudel, S.**, Colman, D.R., Fixen, K.R., Ledbetter, R.N., Zheng, Y., Pence, N., Seefeldt, L.C., Peters, J.W., Harwood, C.S. and Boyd, E.S., 2018. Electron transfer to nitrogenase in different genomic and metabolic backgrounds. *Journal of bacteriology*, pp.JB-00757.
14. Zheng, Y., Harris, D.F., Yu, Z., Fu, Y., **Poudel, S.**, Ledbetter, R.N., Fixen, K.R., Yang, Z.Y., Boyd, E.S., Lidstrom, M.E. and Seefeldt, L.C., Harwood, C.S. 2018. A pathway for biological methane production using bacterial iron-only nitrogenase. *Nature Microbiology*, p.1.
13. Amenabar, M.J., Colman, D.R., **Poudel, S.**, Roden, E.E. and Boyd, E.S., 2018. Electron Acceptor Availability Alters Carbon and Energy Metabolism in a Thermoacidophile. *Environmental microbiology*.
12. Artz, J.H., Mulder, D.W., **Poudel, S.**, Colman, D., Schut, G.J., Williams, S.G., Jones, A.K., Adams, M.W., Boyd, E.S., King, P.W. and Peters, J.W., 2018. Structure-function of [FeFe]- and [NiFe]-Hydrogenases: an Overview of Diversity, Mechanism, Maturation, and Bifurcation. In *Microalgal Hydrogen Production* (pp. 31-66).
11. Colman, D.R., **Poudel, S.**, Hamilton, T.L., Havig, J.R., Selensky, M.J., Shock, E.L. and Boyd, E.S., 2017. Geobiological feedbacks and the evolution of thermoacidophiles. *The ISME Journal*.

10. Costas, A.M.G.†, **Poudel, S.**†, Miller, A.F., Schut, G.J., Ledbetter, R.N., Fixen, K.R., Seefeldt, L.C., Adams, M.W., Harwood, C.S., Boyd, E.S. and Peters, J.W., 2017. Defining Electron Bifurcation in the Electron-Transferring Flavoprotein Family. *Journal of Bacteriology*, 199(21), pp.e00440-17.
†Authors contributed equally to this work.
9. Berry, L., **Poudel, S.**, Tokmina-Lukaszewska, M., Colman, D.R., Nguyen, D.M., Schut, G.J., Adams, M.W., Peters, J.W., Boyd, E.S. and Bothner, B., 2017. H/D exchange mass spectrometry and statistical coupling analysis reveal a role for allostery in a ferredoxin-dependent bifurcating transhydrogenase catalytic cycle. *Biochimica et Biophysica Acta (BBA)-General Subjects* (2017).
8. Nguyen, D.M., Schut, G.J., Zadovnyy, O.A., Tokmina-Lukaszewska, M., **Poudel, S.**, Lipscomb, G.L., Adams, L.A., Dinsmore, J.T., Nixon, W.J., Boyd, E.S. and Bothner, B., 2017. Two functionally distinct NADP⁺-dependent ferredoxin oxidoreductases maintain the primary redox balance of *Pyrococcus furiosus*. *Journal of Biological Chemistry*, 292(35), pp.14603-14616.
7. Therien, J.B., Artz, J.H., **Poudel, S.**, Hamilton, T.L., Liu, Z., Noone, S.M., Adams, M.W., King, P.W., Bryant, D.A., Boyd, E.S. and Peters, J.W., 2017. The Physiological Functions and Structural Determinants of Catalytic Bias in the [FeFe]-Hydrogenases CpI and CpII of *Clostridium pasteurianum* Strain W5. *Frontiers in microbiology*, 8.
6. Colman, D.R., **Poudel, S.**, Stamps, B.W., Boyd, E.S., and Spear, J.R. (2017). The deep, hot biosphere: Twenty-five years of retrospection. *Proceedings of the National Academy of Sciences of the United States of America* 114, 6895-6903.
5. **Poudel, S.**, Tokmina-Lukaszewska, M., Colman, D.R., Refai, M., Schut, G.J., King, P.W., Maness, P.C., Adams, M.W., Peters, J.W., Bothner, B. and Boyd, E.S., 2016. Unification of [FeFe]-hydrogenases into three structural and functional groups. *Biochimica et Biophysica Acta (BBA)-General Subjects*, 1860(9), pp.1910-1921.
4. Mashruwala, A.A., Bhatt, S., **Poudel, S.**, Boyd, E.S. and Boyd, J.M., 2016. The DUF59 containing protein SufT is involved in the maturation of iron-sulfur (FeS) proteins during conditions of high FeS cofactor demand in *Staphylococcus aureus*. *PLoS Genet*, 12(8), p.e1006233.
3. Lindsay, M.R., Anderson, C., Fox, N., Scofield, G., Allen, J., Anderson, E., Bueter, L., **Poudel, S.**, Sutherland, K., Munson-McGee, J.H. and Van Nostrand, J.D., 2017. Microbialite response to an anthropogenic salinity gradient in Great Salt Lake, Utah. *Geobiology*, 15(1), pp.131-145.
2. Kamneva, O.K., **Poudel, S.** and Ward, N.L., 2015. Proteins Related to the Type I Secretion System Are Associated with Secondary SecA_DEAD Domain Proteins in Some Species of Planctomycetes, Verrucomicrobia, Proteobacteria, Nitrospirae and Chlorobi. *PLoS one*, 10(6), p.e0129066.
1. **Poudel, S.**, Aryal, N. and Lu, C., 2015. Identification of MicroRNAs and transcript targets in *Camelina sativa* by deep sequencing and computational methods. *PLoS one*, 10(3), p.e0121542.

Other Publications/Products

1. Undergraduate Honors Thesis, 2012. 'Production of Polyclonal Antibody against *Mycoplasma ovipneumoniae* in Rabbits'. The Honors College, University of Wyoming, Laramie, Wyoming, USA. Advisor: Dr. Jeffery J. Adamovicz.

Manuscript Reviewed for Peer-Reviewed Journal

1. Frontiers of Microbiology.
2. Plos One.
3. Institute of Electrical and Electronics Engineers.
4. Geosciences.

Conferences and Invited Talks

5. **Poudel, Saroj**. "Nanomachines that powered ancient life". The Theobald Smith Society Fall Meeting American Society for Microbiology New Jersey Chapter. 11 November 2019; New Brunswick, New Jersey - Invited Seminar
4. Joshua Mancini*, **Saraj Poudel***, Douglas Pike*, Alexei Tyryshkin, Liti Haramaty, Michael Hecht, Paul Falkowski, Vikas Nanda. "Reinventing primitive protein-based catalysts." *-first co-authors.
3. **Poudel, Saroj**, Eric C. Dunham, Melody R. Lindsay, Daniel, R. Colman, Maximiliano Amenabar, Elizabeth Fones, Erik Anderson, and Eric S. Boyd. "The Genomic and Ecological Landscape of Biological Electron Bifurcation". Gordon Conference: Geobiology; 2018 January 21-26; Galveston, Texas.
2. **Poudel, Saroj**, Monika Tokmina-Luaszezwska, Daniel R. Colman, Mohammed Refai, Gerrit J. Schut, Paul W. King, Pun-Ching Maness, Mike W.W. Adams, John W. Peters, Brian Bothner, and Eric S. Boyd. "Unification of [FeFe]-hydrogenases into three structural and functional groups" (Poster). 11th Hydrogenase Conference; July 10-14th, 2016; Marseille, France.
1. **Poudel, Saroj**, Jacob Artz, Gerrit Schut, Mike W. W. Adams, John W. Peters and Eric S. Boyd. "Identifying the structural determinants that influence the directionality and function of [FeFe]-hydrogenase" (Poster). Gordon Conference: Cell Biology of Metals; 2015 July 25-31; Mount Snow, Vermont.

Workshops

3. Dating in Deep Time II Workshop; August 1-2, 2019; MIT, Cambridge, MA.
2. **ECOGEO Workshop**: Introduction to Environmental 'Omics; 2016, 25-26 July; University of Hawai'i, Manoa, Hawai'i – Scholarship awarded to attend the workshop
1. Data Intensive Summer School; 2014, June 30-July 2; Montana State University, Bozeman, MT

Professional Affiliations

1. American Society for Microbiology (ASM)

Teaching Experience

- Fall, 2019 **Astrobiology (01:460:225)**, “The Last Universal Common Ancestor” – Guest Lecture.
- Spring and Fall, 2016 **General Microbiology Lab (BIOM 360)**, Graduate Teaching Assistant. Fall, 2016 Montana State University, Bozeman, Montana, USA. Overall Teaching Evaluation: 4.85/5.00 (Fall), 4.58/5.00 (Spring, 2016).
- Spring, 2013 **Spinning Webs (CS140)**. Graduate Teaching Assistant. Montana State University, Bozeman, MT

Community/Outreach Activities

- 19 November 2019 **After School Science Program – “Basic Ingredients for Life”**. McKinley School, New Brunswick, NJ
- 12 November 2019 **After School Science Program – “Extreme Environments”**. McKinley School, New Brunswick, NJ
- 21 October 2019 **After School Science Program – “The Solar System”**. McKinley School, New Brunswick, NJ
- 8-12 July, 2019 **The 4-H STEM Ambassadors Program for Urban Youth – “Protein structure and Folding”**. Rutgers University, New Brunswick, NJ.
- 14 April, 2019 **NASA ENIGMA K-8 Family Science Night – “Exploring Life on Other Planets”**, McKinley School, New Brunswick, NJ.
<https://www.njtvonline.org/news/video/students-learn-about-researching-life-on-other-planets/>
- 4 April, 2019 **NASA ENIGMA Family Science Night – “Foldable Microscope”**, The Greater Brunswick Charter School, New Brunswick, NJ.
<https://hudsonvalley.news12.com/clip/14800130/video-family-science-night-at-great-brunswick-charter-school>