Nitrogenase with all the Fixens: decoding electron flow for nitrogen fixation

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Efficient control and manipulation of electron transfer holds the key to unlocking advancements in energy storage, electronic devices, and catalysis. Biological systems are adept at controlling electron flow because coordination of electron flow is central to how life generates energy, maintains redox balance, and protects itself from damaging free radicals. My lab's research addresses outstanding questions that impact our understanding of electron flow from the organismal to the molecular level and center around understanding how bacteria generate, partition, and use reducing equivalents. In this talk, I will share our recent discoveries on electron flow to nitrogenase, one of the planet's most vital enzymes. I will highlight how we are leveraging this understanding to evolve new electron transfer pathways. Through these insights, we endeavor to harness the principles of biological electron transfer to drive innovations in energy, catalysis, and the bioeconomy.

＜Research Interests＞

Dr. Fixen's lab studies microbial physiology with a focus on intracellular electron flow in the photosynthetic bacterium, *Rhodopseudomonas palustris*, investigating how this versatile organism regulates redox balance and uses pathways such as nitrogen fixation to generate reduced compounds like hydrogen and methane.

＜Bio＞

Dr. Kathryn Fixen is an Associate Professor and a McKnight Presidential Fellow in the Department of Plant and Microbial Biology at the University of Minnesota, Twin Cities. She earned her B.S. from the University of Minnesota and her Ph.D. from Harvard Medical School. As a postdoctoral fellow, she worked with Dr. Caroline Harwood at the University of Washington.

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