

## EXPERIENCE

### *management*

Extensive experience leading multidisciplinary and remote teams.  
Integrated multidisciplinary data to solve large scale problems.  
Nearly 20 years of hands-on field and laboratory experience.  
Led teams of technicians, students, postdoctoral fellows and faculty to execute lab and field based work.  
Designed experiments to solve problems in biochemistry with novel applications of molecular biology and protein engineering.  
Proven track record of taking a scientific question from inception through to completion; beginning with an idea through fundraising, experiment design, laboratory bench work, multidisciplinary collaborations, data collection, data analysis and finally communication through authoring papers, lectures and outreach.

### *communication*

Published more than a dozen technical papers in journals including *Science* and *PNAS*.  
Multimedia presentations for both academic (i.e. Columbia, Caltech) and lay audiences (i.e. TED, SFMOMA).  
Teaching and outreach at the college and graduate level including Harvard and Stanford Universities as well as grade schools and community events.

### *fundraising*

Awarded federal grants totaling over \$500K.  
Organized and submitted 50 to 300 page length proposals complete with extensive budget considerations and teams of over 20 scientists.  
Reviewer for major international grant competitions.

## MANAGEMENT WRITING & COMMUNICATION

### *Mentoring, Training and Supervising*

- **Managed and organized teams of supervisors, colleagues and students to complete projects** on time and within budget.
- **Coordinated more than 10 other highly diverse scientists** across the globe to produce high-impact research and publications.
- **Supervised and mentored Ph.D. students** who graduated from Harvard and ASU.
- **Supervised and mentored undergraduate students.** All headed for graduate programs in science. One graduated cum laude from Harvard University under my guidance.
- **Supervised and mentored high school students** all who have gone on to top ranking universities, including Stanford and Amherst.
- **Designed, developed and taught** scientific inquiry, oceanography and astrobiology coursework.
- **Trained international multidisciplinary scientists** in Latin America for UNESCO/NASA.

### *Technical Writing and Scientific Communication*

- **Authored more than a dozen academic papers and published results in high-impact peer-reviewed journals** including *Science*, *Proceedings of the National Academy of Sciences*, *Geobiology*, *Plant Physiology*, *Phycology*, *Limnology and Oceanography*, *Biochemistry*.
- **Reviewed and judged grant proposals** for international agencies including the National Science Foundation, NASA and Netherlands Organization for Scientific Research.
- **Co-raised over \$8,500,000** as a result of successful grant awards from federal agencies (NSF, NASA). Led to sustained support of self and projects. Expanded ties to DOE.
- **Prepared, developed and presented over 30 invited presentations** to audiences that range from the general public (TED, SFMOMA, Chabot Space & Science Center) to interdisciplinary scientists (U.S. National Academy, Royal Society, Gordon Research Conferences).
- Highly develop skills in **information synthesis and communication** across disciplines and sectors.

## TECHNICAL SKILLS

### *Biochemistry*

- Successful cloning, production, extraction and purification of recombinant proteins (soluble and insoluble).
- Employed biochemical assays to test the enzymology and activity of various proteins to look at overall protein biochemistry.
- Used 1- and 2-D gel electrophoresis for protein separation, both native and denatured, could be used for downstream processes such as MS and X-ray analyses including characterization in terms of structural biology.
- Raised and purified antibodies for recombinant proteins to determine expression profile by immuno-blot as well as subcellular localization via immunogold staining. Possibility of also using epitope binning. Interested in utilizing yeast/phage display libraries as well as affinity measurements with surface plasmon resonance.
- Initiated proteomic analyses to produce complete profile of cellular expression under lab-based environmental condition. Interested in directed evolution for protein engineering to produce specific targets.

### *Molecular biology*

- Amplified full-length genes for over-expression and transformed and cloned *E. coli* for protein production.
- Executed accurate PCR (e.g. touch-down, touch-up, nested, quantitative QRT-PCR).
- Helped develop and implement nucleic acid extraction protocol for difficult to extract algae and other environmental microbes.
- Designed primers for degenerate sites and other hard to amplify genes.
- Accurate gel electrophoresis, sequencing and sample analyses.
- Beginning to integrate and use transcriptomics and CRISPR techniques.

### *Physiology*

- Cultured and characterized novel environmentally isolated organisms.
- Maintenance and experiments with difficult aerobic and anaerobic cell cultures (photoautotrophs, chemoautotrophs and heterotrophs).
- Monitored cell growth, physiological state, viability and other parameters using a variety of types of microscopy.
- Characterized nutrient utilization of cells under different conditions.
- Designed and constructed chemostats/fermentors, both with and without irradiance, for long-term culturing and experimental tests.
- Identified differences between chronic and acute biochemical phenotypes for particular physiological property (i.e. glucose uptake, electron donors vs. electron acceptors, detoxification).
- Extensive experience with harvesting cells from batch (shake flask) cultures and plate cultures as well as various aerobic and anaerobic test tube configurations. Working under sterile and metal-clean conditions.
- Altered medium preparation as needed for growth requirements and experimental design (pH, carbon source, temperature, nutrient limitation, etc.).

### *Analytical chemistry and related analyses*

- HPLC for protein purification and metabolite analyses (UV, RID, etc).
- GCMS (ex. N<sub>2</sub> fixation via acetylene reduction).
- IC for inorganic ion analyses.
- UV/vis spectrophotometer for enzymology and standard spectroscopy.
- Density gradient centrifugation employed to isolate biomolecules (i.e. nucleic acids).
- Fluorometry and fast repetition rate fluorometry (FRRF) to characterize photosynthetic properties of cells.

### *Phylogenetic analyses*

- Successful database searches for novel genes (NCBI, ExPASy, PDB).
- Implementation of programs such as VectorNTI, Phyml, PAML, Mr. Bayes and various algorithms for alignment construction and analyses as well as other programs for tree display and testing.
- Identification of novel sites in proteins and genes of evolutionary and functional importance.

### *Field work*

- Field site characterization.
- Identified of key sampling regions.
- Successful retrieval of difficult sample material.
- Enriched for and isolated novel cells under set conditions in the lab.

## EDUCATION

**Oberlin College**, B.A. in Biology (minor: Chemistry), May 2000.

**Oberlin Conservatory of Music**, B.M. in Music Performance on oboe (minor: Ethnomusicology), May 2000.

**Rutgers University**, Ph.D. in Oceanography from the Institute of Marine and Coastal Sciences, May 2006.

Topic of doctoral dissertation: *The Role and Evolution of Superoxide Dismutases in Algae*

## PROFESSIONAL EXPERIENCE

**Mills College**, Chan-Norris Distinguished Visiting Professor, 2016-2018.

**Lawrence Berkeley National Laboratory**, NASA Astrobiology Research Fellow, 2011-2013.

**United States Geological Survey**, NASA Astrobiology Research Fellow, 2010-2011.

**Harvard University**, NSF Postdoctoral Research Fellow in Biology, 2007-2009.

**Arizona State University**, NSF Postdoctoral Research Fellow in Biology, 2006-2007.

**Rutgers University**, Graduate Fellow, Graduate Assistant and Teaching Assistant, 2000-2006.

## HONORS, AWARDS AND FUNDING

Mills College Faculty Member of the Year award, 2018

California Space Grant Consortium Grant Award, 2018

Mills College Faculty Innovation Grant (MACK), 2017-2018

NASA Travel Grant, 2017

Mills College Faculty Development Grant (MACK), 2016-2017

Kavli Fellow, U.S. National Academy of Sciences, 2010

NASA Astrobiology Research Fellowship (NPP), 2010-2013

NASA NAI DDF award, 2009

National Science Foundation Postdoctoral Fellowship in Biology, 2006-2009

International Symposium on Metallomics Young Scientist Award, 2007

NSF Graduate Student Fellowship- honorable mention, 2001

Rutgers University Excellence Graduate Fellowship, 2000

Sigma Xi, Associate Member, 2000

National Science Foundation- Research Experience for Undergraduates (REU), 1999

Hope Hibbard Scholarship in Biology (Oberlin College), 1999

Leo S. Millar Prize in Biological Scholarship (Oberlin College), 1998

## SELECTED PUBLICATIONS

J.B. Glass, A.T. Poret-Peterson, **Felisa Wolfe-Simon** and A.D. Anbar (2013). Molybdenum limitation induces expression of the molybdate-binding protein Mop in a freshwater nitrogen-fixing cyanobacterium. *Advances in Microbiology*. **3**(6A): 9-15.

**Felisa Wolfe-Simon**, J. Switzer Blum, T.R. Kulp, G.W. Gordon, S.E. Hoefft, J. Pett-Ridge, J.F. Stolz, S.M. Webb, P.K. Weber, P.C.W. Davies, A.D. Anbar and R.S. Oremland (2011). Response to comments on "A bacterium that can grow by using arsenic instead of phosphorus". *Science*. **332**: 1149.

**Felisa Wolfe-Simon**, J. Switzer Blum, T.R. Kulp, G.W. Gordon, S.E. Hoefft, J. Pett-Ridge, J.F. Stolz, S.M. Webb, P.K. Weber, P.C.W. Davies, A.D. Anbar and R.S. Oremland (2011). A bacterium that can grow by using arsenic instead of phosphorus. *Science*. **332**: 1163-1166. Published online Dec 2, 2010.

D. Chauhan, I.M. Folea, C. Jolley, R. Kouřil, C. Lubner, S. Lin, D. Kolber, **Felisa Wolfe-Simon**, J. Golbeck, E.J. Boekema & P. Fromme (2011). A novel photosynthetic strategy for adaptation to low iron aquatic environments. *Biochemistry*. **50**: 686-692

M.B. Higgins, **Felisa Wolfe-Simon**, R.S. Robinson, Y. Qin, M.A. Saito and A. Pearson (2011). Paleoenvironmental implications of taxonomic variation among  $\delta^{15}\text{N}$  values of chloropigments. *Geochimica et Cosmochimica Acta*. **75**: 7351-7363.

J.B. Glass, **Felisa Wolfe-Simon**, J.J. Elser and A.D. Anbar (2010). Molybdenum–nitrogen colimitation in heterocystous cyanobacteria. *Limnology and Oceanography*. **55**: 667–676.

D.T. Johnston\*, **Felisa Wolfe-Simon\***, A. Pearson, and A.H. Knoll (2009). Anoxygenic photosynthesis modulated Proterozoic oxygen and sustained Earth's middle age. *Proceedings of the National Academy of Sciences*. **106**: 16925-16929

R.S. Oremland, C. Saltikov, **Felisa Wolfe-Simon**, and J.F. Stolz (2009). Arsenic in the evolution of Earth and extraterrestrial ecosystems. *Geomicrobiology Journal*. **26**: 522 - 536.

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\*Authors contributed equally

- Felisa Wolfe-Simon**, P.C.W. Davies and A.D. Anbar (2009). Did nature also choose Arsenic? *International Journal of Astrobiology*. **8**: 69-74.
- J.B. Glass, **Felisa Wolfe-Simon**, and A.D. Anbar (2009), Coevolution of marine metal availability and photoautotrophic nitrogen assimilation. *Geobiology*. **7**: 100-123.
- P.C.W. Davies, S.A. Benner, C.E. Cleland, C.H. Lineweaver, C.P. McKay and **Felisa Wolfe-Simon** (2009). Signatures of a shadow biosphere. *Astrobiology*. **9**: 241-249.
- Felisa Wolfe-Simon**, V. Starovoytov, J.R. Reinfelder, O. Schofield, and P. G. Falkowski (2006). Localization and role of manganese superoxide dismutase in a marine diatom. *Plant Physiology*. **142**: 1701-1709.
- Felisa Wolfe-Simon** (2006). The role and evolution of superoxide dismutases in algae. Ph.D. Dissertation. Rutgers Graduate Program in Oceanography.
- Felisa Wolfe-Simon**, D. Grzebyk, O. Schofield, and P. G. Falkowski (2005). The role and evolution of superoxide dismutase in algae. *Journal of Phycology*. **41**: 453-465.
- Felisa Wolfe**, K. Kroeger and I. Valiela (1999). Increased lability of estuarine dissolved organic nitrogen from urbanized watersheds. *Biological Bulletin*. **197**:290-292.

#### INVITED LECTURES

- Bay Area Science Festival**. Berkeley Public Library, Berkeley, CA, 2018.
- American Chemical Society URS**. keynote lecture, Oakland, CA, 2018.
- Mills College**. Oakland, CA, 2015.
- Chabot Space and Science Center**. Oakland, CA, 2013.
- Smithsonian Institution**. Life in the Cosmos Workshop. Washington, D.C. 2012.
- Gordon Research Conference on the Origins of Life**. Galveston, TX, 2012.
- University Pierre and Marie CURIE/Sorbonne**. Paris, FRANCE, 2011.
- Pacific Northwest National Laboratory**. Richland, WA, 2011.
- TED**. Long Beach, CA. 2011
- United States National Academy of Sciences**. Washington, D.C. 2011.
- LDEO/Columbia University**. New York, NY, 2011.
- NASA Ames Research Center**. Director's Colloquium. Moffett Field, CA, 2011.
- The Royal Society**. London, UNITED KINGDOM, 2010.
- International Geobiology Summer Course**. *Colorado School of Mines*. Golden, CO, 2010.
- NASA AbSciCon**. League City, TX, 2010.
- U.S. Geological Survey**. Menlo Park, CA, 2010.
- Pomona College**. Claremont, CA, 2009.
- 2<sup>nd</sup> Iberoamerican School of Astrobiology**. Montevideo, URUGUAY, 2009.
- Swiss Federal Institute of Technology Zürich (ETH Zürich) & University of Zürich**. Zürich, SWITZERLAND, 2009.
- University of Washington**. Seattle, WA, 2009.
- Amherst College**. Amherst, MA, 2009.
- Metals in Biology Gordon Research Conference**. Ventura, CA, 2009.
- Bryn Mawr College**. Bryn Mawr, PA, 2009.
- The Max Planck Institute for Marine Microbiology & Carl von Ossietzky Univ. of Oldenburg**. Oldenburg, GERMANY. 2008.
- ICREA Conference on the Origin and Early Evolution of Metazoans**. Barcelona, SPAIN, 2008.
- Gordon Research Conference on Photosynthesis**. South Hadley, MA, 2008.
- Gordon Research Conference on Environmental Bioinorganic Chemistry**. Waterville Valley, NH, 2008.
- The Carnegie Institution of Washington**. Geophysical Laboratory. Washington, D.C. 2008.
- American Geophysical Union**. San Francisco, CA (*note*: coauthor as invited speaker) 2008.
- California Institute of Technology**. Pasadena, CA, 2008.
- Massachusetts Institute of Technology**. Dept. of Earth, Atmospheric and Planetary Sciences. Cambridge, MA, 2008
- Gordon Research Conference on the Origins of Life**. Ventura, CA, 2008.
- IFREE. JAMSTEC**. Yokosuka, JAPAN, 2007.
- International Symposium on Metallomics**. Nagoya Congress Center. Nagoya, JAPAN, 2007.
- Harvard University**. Earth History and Paleobiology Seminar Series. Cambridge, MA, 2006.
- Arizona State University**. Meeting on Environmental Signatures of Alternative Biochemistry. Tempe, AZ, 2006.
- Princeton University**. Center for Environmental Bioinorganic Chemistry, summer conference. Princeton, NJ, 2003.
- Rutgers University**. Biocomplexity Seminar. New Brunswick, NJ, 2003.

## SELECTED CONTRIBUTED LECTURES AND PRESENTATIONS

- F. Wolfe-Simon**, S.M. Yannone and J.A. Tainer (2011). Characterizations of intracellular arsenic in a bacterium. AGU Fall Meeting. San Francisco, CA
- F. Wolfe-Simon**, S.E. Hoefft, S.M. Baesman and R.S. Oremland (2010). Facultative anoxygenic photosynthesis by cyanobacteria driven by arsenite and sulfide (with evidence for the support of nitrogen fixation). AGU Fall Meeting. San Francisco, CA
- F. Wolfe-Simon**, S.E. Hoefft and R.S. Oremland (2010). Facultative anoxygenic photosynthesis by cyanobacteria driven by arsenite. Gordon Research Conference: Environmental Bioinorganic Chemistry. Newport, RI.
- F. Wolfe-Simon**, J. Switzer Blum, T.R. Kulp, G.W. Gordon, S.E. Hoefft, S.M. Webb, P.C.W. Davies, A.D. Anbar and R.S. Oremland (2010). As as a substitute for P: Evidence of a shadow biosphere from Mono Lake, CA? Gordon Research Conference: Environmental Bioinorganic Chemistry. Newport, RI.
- F. Wolfe-Simon**, S.E. Hoefft, and R.S. Oremland (2010). Facultative anoxygenic photosynthesis by cyanobacteria driven by arsenite. ACS National Meeting. San Francisco, CA
- F. Wolfe-Simon**, D.T. Johnston, P.R. Girguis, A. Pearson and A.H. Knoll (2009). Iron, Sulfur, Arsenic, and Water: Geochemical implications of facultative anoxygenic photosynthesis in cyanobacteria and the slow rise of Oxygen. Boston Bacteria Meeting. Cambridge, MA
- F. Wolfe-Simon**, D.T. Johnston, P.R. Girguis, A. Pearson and A.H. Knoll (2008). Iron, Sulfur, Arsenic, and Water: Geochemical implications of facultative anoxygenic photosynthesis in cyanobacteria and the slow rise of Oxygen. AGU Fall Meeting. San Francisco, CA
- F. Wolfe-Simon**, P.C.W. Davies and A.D. Anbar (2008). Did nature also choose Arsenic? NASA AbSciCon. Santa Clara, CA.
- F. Wolfe-Simon**, P. Fromme, W.F.J. Vermaas, J.J. Elser and A. D. Anbar (2007). Evolutionary Geobiochemistry: Fe-deficient photosynthetic eukaryotes' Cu demand suggests ecological success stalled until widespread oxic conditions. CEBIC Summer Conference. Princeton University. Princeton, NJ
- F. Wolfe-Simon**, J. Morgan, J.J. Elser and A. D. Anbar (2007). Evolutionarily significant differences between prokaryotic and eukaryotic responses to Fe stress. ASLO Aquatic Sciences Meeting, Santa Fe, NM
- F. Wolfe-Simon**, J. Morgan, J.J. Elser and A. D. Anbar (2006). Metallomic plasticity of cyanobacteria induced by iron availability. Gordon Research Conference: Environmental Bioinorganic Chemistry. Andover, NH.
- F. Wolfe-Simon**, V. Starovoytov, J.R. Reinfelder, O. Schofield and P. G. Falkowski (2006). Localization and role of manganese superoxide dismutase in a marine diatom. NASA AbSciCon. Washington, D.C.
- F. Wolfe-Simon**, O. Schofield, and P. G. Falkowski (2006) The Metalloenzyme SOD and Its Role in Photoautotroph Evolution and Regulation. Symposium on The Evolution of Aquatic Photoautotrophs. New Brunswick, NJ
- F. L. Wolfe**, V. Starovoytov, O. Schofield and P. Falkowski. (2005). Diatoms express a novel MnSOD in the chloroplast that responds to light stress. ASLO Aquatic Sciences Meeting, Salt Lake City, UT
- F. L. Wolfe**, O. Schofield and P. Falkowski. (2004). The Metalloenzyme SOD and its role in photoautotroph evolution and regulation. Gordon Research Conference: Environmental Bioinorganic Chemistry. Lewiston, ME
- F. L. Wolfe**, O. Schofield and P. Falkowski. (2004). The comparative molecular evolution of iron and manganese superoxide dismutase in oxygenic photoautotrophs. ASLO Ocean Research Conference, Honolulu, HI
- F. L. Wolfe**, I. Berman-Frank, L. Haramaty and P. Falkowski. (2003). The metallic shield of *Trichodesmium*: Fighting oxidative damage. ASLO Aquatic Sciences Meeting, Salt Lake City, UT
- F. L. Wolfe**, I. Berman-Frank, L. Haramaty and P. Falkowski. (2002). The metallic shield of *Trichodesmium*: Fighting oxidative damage. Gordon Research Conference: Environmental Bioinorganic Chemistry. Andover, NH
- F. Wolfe**, K. Kroeger and I. Valiela (2000). Increased lability of estuarine dissolved organic nitrogen from urbanized watersheds. ASLO/AGU Ocean Sciences Meeting, San Antonio, TX
- F. Wolfe**, K. Kroeger and I. Valiela (1999). Increased lability of estuarine dissolved organic nitrogen from urbanized watersheds. General Scientific Meeting, Marine Biological Laboratory, Woods Hole, MA
- F. L. Wolfe** and D. Coats (1997). Host specificity of the parasitic dinoflagellate *Amoebophrya ceratii*. 7<sup>th</sup> Annual East Coast Protist Meeting, Narragansett, RI

## PROFESSIONAL AFFILIATIONS

American Chemical Society  
 Society of Bio-inorganic Chemistry  
 Society for Molecular Biology and Evolution  
 Sigma Xi, The Scientific Research Society  
 American Society of Plant Biologists  
 American Geophysical Union  
 American Society of Limnology and Oceanography

## TEACHING EXPERIENCE

- Spring 2018 Astrobiogeochemistry: ENVS180A (Mills)  
Spring 2017 Astrobiogeochemistry: ENVS180AS (Mills)  
Spring 2016 Oceanography: ENVS105 (Mills)  
Spring 2011 Guest Lecturer: CHEM181 Biochemistry (Stanford)  
Spring 2009 Teaching Fellow: LS110 Microbial World (Harvard)  
Spring 2008 Guest Moderator: EPS137 Biogeochemistry (Harvard)  
Fall 2006 Guest Lecturer: PHY598 Topics in Biophysics: An Overview of Modern Biology for Physicists (ASU)  
Spring 2005 Lead Instructor and Coordinator: MS 303 Oceanographic Scientific Inquiry:  
From Biogeochemistry to Genomes: Explorations at Aquatic Interfaces. (Rutgers)  
Fall 2002 Teaching Assistant: OCN 540 Chemical Oceanography.  
(Rutgers graduate course; problem solving section)  
Fall 2001 Teaching Assistant: OCN 540 Chemical Oceanography.  
(Rutgers graduate course; problem solving section)

## PROFESSIONAL SERVICE

*Founder and Organizer.* Chan-Norris Conversations in Science Seminar Series. Mills College. Oakland. CA 2016-2018

*Acting Reviewer.* Aquatic Microbial Ecology; Astrobiology; Australian Journal of Botany; Chemical Geology; Environmental Microbiology; Environmental Science and Technology; Eukaryotic Cell; Geobiology; International Journal of Astrobiology; Israeli Science Foundation; Journal of Phycology; Limnology and Oceanography; U.S. National Science Foundation; Plant Physiology; Water Research.

*Session Co-Convener.* Elements and Evolution. AGU Fall Meeting, San Francisco, CA. December 2008

*Session Convener and Co-Chair.* Trace metals, microbial processes, and biogeochemical cycles through space and time. ASLO Aquatic Sciences Meeting, Santa Fe, NM. February 2007

*President.* Oceanography Graduate Student Association. 2003-2004