CEDRIC OWENS

Assistant Professor of Biochemistry
Schmid College of Science and Technology
Chapman University

226 Keck Center for Science and Engineering
Orange, CA, USA
Email: cpowens@chapman.edu
Phone: 001-949-743-4368

EDUCATION

2007-2012 Ph.D. in Biological Sciences
University of California, Irvine
Irvine, CA
Advisor: Dr. Celia Goulding
Title of dissertation: *Biochemical, biophysical and structural investigation of heme uptake in Mycobacterium tuberculosis and Bacillus anthracis*

2003-2007 B.A. in Chemistry/Biochemistry and B.A. in Mathematical Sciences, *cum laude*
Colby College
Waterville, ME
Research Advisor: Dr. Rebecca Conry
Project title: *Synthesis of Cu(I) arene complexes*

1995-2003 Abitur (High School)
Bayreuth, Germany

PROFESSIONAL EXPERIENCE

Aug 2016 - present Assistant Professor
Chapman University
Orange, CA
Research projects:
(1) Elucidating electron transfer in biological nitrogen fixation.
(2) Studying regulation of nitrogen fixation.
(3) Engineering nitrogen fixation in agriculturally relevant diazotrophs.

Jan 2013 - June 2016 Postdoctoral Researcher
University of California, San Diego
San Diego, CA
Advisor: Dr. Akif Tezcan

Oct 2012 - Dec 2012 Postdoctoral Researcher
University of California, Irvine
Irvine, CA
Advisor: Dr. Celia Goulding

PUBLICATIONS

1. Chao, A., Sieminski, P. J., Owens, C. P., Goulding, C. W. (2018) Iron acquisition in *Mycobacterium tuberculosis*. *Chem. Rev.* (published online ahead of print).

2. Owens, C. P., Tezcan, F. A. (2018) Conformationally gated electron transfer in nitrogenase. Isolation, purification and characterization of nitrogenase from *Gluconacetobacter diazotrophicus*. *Meth. Enzym.* **599**, 355-386

3. Katz F. E., Shi X., Owens C. P., Joseph, S., Tezcan F. A. (2017) Determination of nucleoside triphosphatase activities from measurement of true inorganic phosphate in the presence of labile phosphate compounds. *Anal. Biochem*. **520**, 62-67

4. Owens, C. P., Katz, F. E. H., Carter, C. H., Oswald, V. F., Tezcan, F. A. (2016) Tyrosine-coordinated P-cluster in *G. diazotrophicus* nitrogenase: Evidence for the importance of O-based ligands in conformationally gated electron transfer. *J. Am. Chem. Soc.* **138**, 10124-10127

5. Katz F. E. H., Owens, C. P., Tezcan F. A. (2016) Electron Transfer Reactions in Biological Nitrogen Fixation, *Isr. J. Chem.* **56**, 682-692

6. Owens, C. P., Katz, F. E. H., Carter, C. H., Luca, M. A., Tezcan, F. A. (2015). Evidence for functionally relevant encounter complexes in nitrogenase catalysis. *J. Am. Chem. Soc.* **137**, 12704-12712

7. Owens, C. P., Chim, N., and Goulding, C. W. (2013) Insights on how the Mycobacterium tuberculosis heme uptake pathway can be used as a drug target. *Future Med. Chem.* **5**, 1391–1403

8. Owens, C. P., Chim, N., Graves, A. B., Harmston, C. A., Iniguez, A., Contreras, H., Liptak, M. D., and Goulding, C. W. (2013) The Mycobacterium tuberculosis secreted protein Rv0203 transfers heme to membrane proteins MmpL3 and MmpL11. *J. Biol. Chem.* **288**, 21714–21728

9. McMath, L. M., Contreras, H., Owens, C. P., and Goulding, C. W. (2013) The structural characterization of bacterioferritin, BfrA, from Mycobacterium tuberculosis. *J. Porphyrins Phthalocyanines* **17**, 229–239

10. Honsa, E. S., Owens, C. P., Goulding, C. W., and Maresso, A. W. (2013) The near-iron transporter (NEAT) domains of the anthrax hemophore IsdX2 require a critical glutamine to extract heme from methemoglobin. *J. Biol. Chem.* **288**, 8479–8490

11. Chim, N., Owens, C. P., Contreras, H., and Goulding, C. W. (2012) Advances in Mycobacterium tuberculosis therapeutics discovery utilizing structural biology. *Infect. Disord. Drug Targets.* e-pub, [published online November 16, 2012: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3695056/]

12. Ekworomadu, M. T., Poor, C. B., Owens, C. P., Balderas, M. A., Fabian, M., Olson, J. S., Murphy, F., Balkabasi, E., Honsa, E. S., He, C., Goulding, C. W., and Maresso, A. W. (2012) Differential function of lip residues in the mechanism and biology of an anthrax hemophore. *PLoS Pathog.* **8**, e1002559

13. Owens, C. P., Du, J., Dawson, J. H., and Goulding, C. W. (2012) Characterization of heme ligation properties of Rv0203, a secreted heme binding protein involved in Mycobacterium tuberculosis heme uptake. *Biochemistry* **51**, 1518–1531

14. Tullius, M. V., Harmston, C. A., Owens, C. P., Chim, N., Morse, R. P., McMath, L. M., Iniguez, A., Kimmey, J. M., Sawaya, M. R., Whitelegge, J. P., Horwitz, M. A., and Goulding, C. W. (2011) Discovery and characterization of a unique mycobacterial heme acquisition system. *Proc. Natl. Acad. Sci. U.S.A.* **108**, 5051–5056

FUNDING

2014 Deciphering Conformational Gating in Electron Transfer in Biological Nitrogen Fixation
USDA National Institute of Food and Agriculture - Agriculture and Food Research Initiative Postdoctoral Fellowship
Jan. 2015 – July 2019 ($137,815)

2018 Redox regulation of nitrogen fixation by iron-sulfur proteins
Schmid College Capstone Research Support
Feb. – May 2018 ($1,000)

PRESENTATIONS

Invited talks

2017 California State University, Los Angeles, CA
Redox dependent structural changes in nitrogenase

2016 California State University, East Bay, Hayward, CA
Electron transfer and protein-protein interactions in nitrogenase

2015 Chapman University, Orange, CA
Protein-protein interactions in biological nitrogen fixation

2015 California State University, San Bernardino, CA
Protein-protein interactions in nitrogenase turnover

Conferences

2018 European Nitrogen Fixation Conference (ENFC), Stockholm, Sweden
Structures of reduced and oxidized MoFeP from *Gluconacetobacter diazotrophicus*

2017 Protein Society meeting, Montreal, Canada
Redox dependent structural changes in nitrogenase from *Gluconacetobacter diazotrophicus*

2016 American Chemical Society National Meeting, San Diego, CA
Evidence for functionally relevant encounter complexes in nitrogenase catalysis

2015 National Institute of Food and Agriculture fellows meeting, Washington, DC
Protein-protein interactions in biological nitrogen fixation

2014 Iron Sulfur Enzymes, Gordon Research Conference, Boston, MA.
(attendee)

2011 Bioinorganic Chemistry, Gordon Research Seminar, Ventura, CA
Investigation of the heme binding properties of mycobacterial heme uptake proteins

2010 Bioinorganic Chemistry, Gordon Research Seminar, Ventura, CA
Heme binding properties of the mycobacterial proteins Rv0203 and MmpL3 and heme transfer between the two proteins

COURSES TAUGHT

Chapman University
Biochemistry – Bioenergetics and Metabolism (BCHM 336)
Physical Biochemistry (BCHM 420)
Physical Biochemistry Laboratory (BCHM 420L)
General Chemistry Laboratory (CHEM 150L)

UC Irvine (as instructor)
Molecular Biology Laboratory

STUDENT MENTORING

Chapman University
Since 2016, I have mentored 14 undergraduate students and supervised 6 capstone research projects. Three student researchers received $1,000 fellowships from the Chapman Office of Undergraduate Research. In addition to working with Chapman students, I also participate in an NSF-REU program for community college students, organized by Dr. Chris Kim at Chapman.

UC San Diego (2013-2016)
I mentored one undergraduate student for two years. The student worked on an independent project and presented his research at the Southern California Undergraduate Research Conference, and at the UC San Diego Undergraduate Research Symposium. He is a co-author on a publication in the Journal of the American Chemical Society.

PROFESSIONAL SERVICE

Chapman University
Institutional Animal Care and Use Committee (IACUC)

Other Professional activities
Organizing committee for 21th International Conference for Biological Inorganic Chemistry (ICBIC), Long Beach, CA, 2023

Member of:
American Chemical Society (ACS), American Society for Biochemistry and Molecular Biology (ASBMB)

LANGUAGES
Native in spoken and written English and German
Highly proficient in spoken and proficient in written French