CORIE RALSTON

Biophysicist Staff Scientist
Head, Berkeley Center for Structural Biology
Physical Biosciences Division
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RESEARCH STATEMENT

As head of the Berkeley Center for Structural Biology, I drive advanced technological development of protein crystallography beamlines in order to serve a wide structural biology community. Recent achievements include upgrades of beamline optics and endstation software and hardware on five different beamlines in order to specifically facilitate successful data collection on small and weakly diffracting crystals. These upgrades have enabled my current crystallography efforts, which include the structural and functional characterization of chaperonin proteins; in particular delineating the mechanisms of nucleotide binding and subsequent substrate folding.

EDUCATION

PhD, **Biophysics**	University of California at Davis, Doctoral Advisor: Stephen P. Cramer Thesis Title: L-edge Spectroscopy of Nickel Proteins
BS, **Physics**	University of California at Berkeley Honors Thesis in Physics

ACCOMPLISHMENTS

- Successful commissioning and operation of the Howard Hughes Medical Institute beamlines at the Advanced Light Source from their build date in 2001 to the present
- As the BCSB Operations Manager, stabilized and maintained efficient and highly reliable operations of five crystallography beamlines for the past five years, including oversight of major optics upgrades and numerous endstation improvements
- Oversight of Collaborative Crystallography program, which has resulted in over a hundred PDB depositions in the previous three years
- Maintained active research program collaborations in several structure-based projects, including work on chaperonin proteins with Dr. Paul Adams, LBNL, and Dr. Judith Frydman, Stanford University

PROFESSIONAL EXPERIENCE

Head, Berkeley Center for Structural Biology May 2012 - present
Physical Bioscience Division, Lawrence Berkeley National Laboratory

Staff Scientist Jan 2008 – May 2012
Physical Bioscience Division, Lawrence Berkeley National Laboratory

Scientist Jan 2002 – Jan 2008
Physical Biosciences Division, Lawrence Berkeley National Laboratory

Post-Doctoral Researcher Sept 1997 – Sept 2001
NIH post-doctoral research fellowship
Physiology and Biophysics Department, Albert Einstein College of Medicine

- *Research on RNA kinetics of folding using time resolved X-ray footprinting*

Teaching Assistant and **Research Assistant** Sept 1991 – Sept 1997
Physics and Applied Science Departments
University of California at Davis

- *(Ph.D. research) Characterization of structure and function of nickel proteins in various states within a catalytic cycle using the technique of X-Ray absorption spectroscopy*
- *Developed soft x-ray spectroscopy experiments at the ALS, SSRL and the NSLS*
- *Taught lab section of undergraduate physics courses*

Associate Engineer July 1989 – Aug 1991
IBM Corporation, Hopewell Junction, NY

- *Developed new laser ablation techniques for thin film packaging technology*

PROFESSIONAL ACTIVITIES

- Advanced Light Source Users Executive Committee: liaison between beamline users and ALS management. Served 2004-6, Re-elected for 2011-2013 cycle and elected Chair in 2013.
- Synchrotron and Neutron Users Group: advocating for synchrotron sciences to Congress, 2004 – 2007
- ALS Staff Safety Committee, Deputy Chair, 2006 – present
- Served as reviewer for NSF Instrumental Development for Biological Research (IDBR) program, Aug, 2011
- Served on the BES Review of the NSLS, April 2008 and Dec 2010
- Served on NIH Scientific Review Special Emphasis panel to evaluate grant proposals for shared x-ray crystallographic instruments (grants up to $500k) June 2009 and June 2010

PUBLICATIONS (since 2010)

J.H. Pereira, C.Y. Ralston, N. Douglas, D. Meyer, K.M. Knee, D.R. Goulet, J.A. King, J. Frydman, P.D. Adams, "Crystal Structures of a Group II Chaperonin Reveal the Open and Closed States Associated with the Protein Folding Cycle," *J. Biol. Chem*. 285 (36) 27958-27966, 2010.

J. Rinaldi, J. Wu, J. Yang, C.Y. Ralston, B. Sankaran, S. Moreno, S.S. Taylor, "Structure of Yeast Regulatory Subunit: A Glimpse into the Evolution of PKA Signaling," *Structure* 18, 1471-1482, 2010.

J.H. Pereira*, C.Y. Ralston*, N.R. Douglas, R. Kumar, T. Lopez, R.P. McAndrew, K.M. Knee, J.A. King, J. Frydman, P.D. Adams, "Mechanism of Nucleotide Sensing in Group II Chaperonins," *EMBO J*., 31, 731-740**,** 2012. *authors contributed equally to work

Ralston, C. "Structural Biology: Award-Winning Innovation", ALS Spectrum, Facility Report 2011-2012, p.11. August 2012.

S.Bailey, C. Ralston, K. Goldberg, "Industry at the ALS", ALS Spectrum, Facility Report 2011-2012, p.1. August 2012.

J. Bohon, R. D'Mello, C. Ralston, S. Gupta, M. R Chance, "Synchrotron footprinting on tour," *J. Sync. Rad.,* 21, 24-31, 2014.

S. Gupta, R. Celestre, C. Petzold, M.R. Chance, C. Ralston, "Development of a microsecond x-ray protein footprinting facility at the Advanced Light Source," *J. Sync. Rad*., 2014, 21, 690, 2014.

S. Gupta, R. Celestre, J. Bohon, M.R. Chance, C. Ralston, "Development of a High Throughput X-Ray Footprinting Facility at the Advanced Light Source to Study the Structure and Dynamics of Complex Biological Macromolecules," *Biophysical Journal,* 106(2) 457a, 2014.

J. Bohon, C. Ralston, R. D'Mello, S. Gupta, M.R. Chance, "Synchrotron X-Ray Footprinting on Tour," *Biophysical Journal,* 106(2) 457a, 2014.

P. Zwart, J. Taylor, S. Morton, R. Cayford, G. Fontenay, M. Allaire, B. Sankaran, J. Dickert, K. Royal, A. Rozales, A. Dauz, D. Bryant, N. Smith, S. Ortega, N. Sauter, P.D. Adams, C. Ralston, "The Berkeley Center for Structural Biology at the Advanced Light Source," *SRN*, v. 28 No2, 22-27, 2015.

R.L. Leverenz, M. Sutter, A. Wilson, S. Gupta, A. Thurotte, C. Boucier de Carbon, C. Petzold, C. Ralston, D. Kirilovsky, C.A. Kerfeld, "Carotenoid translocation in the Orange Carotenoid Protein activates a photoprotective mechanism in cyanobacteria," *Science*, 348(6242):1463-1466, 2015

Gupta S, Guttman M, Leverenz RL, Zhumadilova K, Pawlowski EG, Petzold CJ, Lee KK, Ralston C, Kerfeld CA. Local and global structural drivers for the photoactivation of the orange carotenoid protein. 2015, *Proceedings National Academy of Sciences*, Sep 18. Online, 2015.