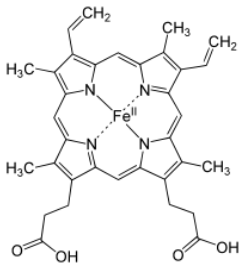

KATHERINE E. FRATO, PhD

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CURRENT POSITION

ASSISTANT PROFESSOR OF CHEMISTRY, SEATTLE UNIVERSITY -- 2013

EDUCATION

Johns Hopkins University School of Medicine — PhD in Biophysics and Biophysical Chemistry, October 2009
Dissertation: A DNA-Assisted Binding Assay for Weak Protein-Protein Interactions
Advisor: Robert Schleif

The College of Wooster — BA in Physics and Biology (double major), May 2004 *Summa cum laude*

TEACHING EXPERIENCE

SEATTLE UNIVERSITY

Biochemistry I (CHEM 454) Fall 2013 (Team taught with Prof. Minderhout), Spring 2014

Biochemistry Lab I (CHEM 464) Fall 2013

Biochemistry Lab II (CHEM 465) Winter 2014

General Chemistry II (CHEM 122) Winter 2014

Qualitative Inorganic Chemistry Lab (CHEM 133) Spring 2014

POSTDOCTORAL FACULTY FELLOW, CHEMISTRY, BOSTON UNIVERSITY — 2010-2012

Designed and led discussion sections focused on group problem-solving for the intensive general chemistry sequence (fall: CH109, spring: CH110); Guest lecturer in CH109 and CH110 (at least 3 weeks each semester).

AFFILIATE ASSISTANT PROFESSOR, CHEMISTRY, LOYOLA UNIVERSITY MARYLAND — FALL 2009

Oversaw two lab sections each week.

TEACHING ASSISTANT, BIOLOGY, JOHNS HOPKINS UNIVERSITY — FALL 2008

Advised undergraduate biochemistry students during office hours, graded homework and exams.

TEACHING ASSISTANT, BIOPHYSICS, JOHNS HOPKINS UNIVERSITY — FALL 2005

Advised undergraduate xray crystallography students during office hours, graded homework assignments.

RESEARCH EXPERIENCE

POSTDOCTORAL FELLOW IN CHEMISTRY, BOSTON UNIVERSITY — 2010-2013

Projects: Analysis of binding and electron transfer between representative bacterial diheme peroxidases and their native electron donor proteins; Electrochemical analysis of the cancer drug target thioredoxin reductase through development of a new microfluidics-based device.

Key skills: Expression and purification of heme-containing proteins; electrochemical methods for thermodynamic and kinetic analysis of redox-active proteins; developing spectroscopic assays for enzyme activity.

GRADUATE STUDENT IN BIOPHYSICS, JOHNS HOPKINS UNIVERSITY — 2004-2010

Projects: Developing a DNA-assisted binding assay for very weak protein-protein interactions; Structural determinants of sequence specificity in the essential RNA splicing factor U2AF65.

Key skills: Implementing strategies for site-directed labeling of proteins; developing a fluorescence quenching assay; molecular cloning in *E. coli*; biophysical analysis of proteins by intrinsic tryptophan fluorescence, fluorescence anisotropy, isothermal titration calorimetry, surface plasmon resonance, and x-ray crystallography.

PUBLICATIONS

Ellis, K. E., **Frato, K.E.**, Elliott, S.J. 2012. Impact of quaternary structure upon bacterial cytochrome c peroxidases: does homodimerization matter? Biochemistry. 51:10008-16.

Pulcu, G. S.*, **Frato, K. E.***, Gupta, R., Hsu, H.-R., Levine, G. A., Hendrich, M. P. and Elliott, S. J. 2012. The diheme cytochrome c peroxidase from *Shewanella oneidensis* requires reductive activation. Biochemistry 51: 974–985.

Frato, K. E. and Schleif, R. F. 2009. A DNA-assisted binding assay for weak protein-protein interactions. J. Mol. Biol. 394: 805-814.

Sickmier, E. A., **Frato, K. E**., Shen, H, Paranawithana, S.R., Green, M. R. and Kielkopf, C. L. 2006. Structural basis for polypyrimidine tract recognition by the essential pre-mRNA splicing factor U2AF65. Mol Cell. 23(1):49-59.

Sickmier, E. A., **Frato K. E.** and Kielkopf, C. L. 2006. Crystallization and preliminary X-ray analysis of a U2AF65 variant in complex with a polypyrimidine-tract analogue by use of protein engineering. Acta Cryst Sect F. 62(Pt 5):457-9.

RESEARCH ABSTRACTS AND TALKS (STARS INDICATE UNDERGRADUATE COAUTHORS)

Talk: Keck, I.* and Frato, K. An affinity chromatography method produces high purity of a kringle domain-containing polypeptide from *T. psuedonana*. Regional ACS Undergraduate Research Symposium, Bellingham, WA, 2014.

Poster: Warburg, M.* and Frato, K. Visualizing the Evolutionary History of Kringle Domains in *T. pseudonana.* Regional ACS Undergraduate Research Symposium, Bellingham, WA, 2014.

Poster: Nguyen, T.* and Frato, K. Thermal Stability of a Detoxifying Heme Peroxidase from a Cold-Adapted Diatom. Regional ACS Undergraduate Research Symposium, Bellingham, WA, 2014.

Poster: Frato, K. E. and Elliott, S. J. Investigation of electron transfer complexes between *Shewanella oneidensis* cytochrome c peroxidase and ScyA through computational and biochemical analysis. Biophysical Society National Meeting, Philadephia, 2013.

Poster talk: Frato, K. E. and Elliott, S. J. Investigating Mechanism Using Protein Electrochemistry: Bacterial diheme cytochrome c peroxidases. Gordon Research Conference: Protein Radicals, Cofactors and Quinones. South Hadley, 2012.

Poster: Frato, K. E. and Elliott, S. J. Investigating the Interaction Between *Shewanella oneidensis* Cytochrome c Peroxidase and its Electron Donor c5. Biophysical Society National Meeting, San Diego, 2012.

Invited speaker: FAES continuing education program on Protein-DNA interactions, NIH, Bethesda, MD. “Measuring Ultra-Weak Interactions Using DNA-Assistance”. November 11, 2009.

Poster: Frato, K. E. and Kielkopf, C. L. “Structures of the Essential RNA Splicing Factor U2AF65 Bound to Alternative Polypyrimidine Tracts.” Biophysical Society National Meeting, Baltimore, 2007.

Poster: Frato, K., Paranawithana, S., Sickmier, A. and Kielkopf, C. “Characterization of DNA and RNA Binding of Site-Directed Mutants of U2AF65.” Eukaryotic mRNA Processing Meeting, Cold Spring Harbor Labs, August 2005.

UNDERGRADUATE RESEARCH MENTORING

SEATTLE UNIVERSITY

Ian Keck, Fall 2013 - Spring 2014. B.S. Biochemistry, 2014.

Thuy Nguyen, Winter 2014- current. B.S. Biochemistry, expected 2015.

Max Warburg, Winter 2014- current. B.S. Biochemistry, expected 2015.

Kris Oshiro, Winter 2014 - Spring 2014. B.A. Psychology, 2014.

Max Echterling, Spring 2014- current. B.S. Cell and Molecular Biology, expected 2015.

PREVIOUS UNDERGRADUATE MENTORING EXPERIENCE

Natalie Jones, Boston University undergraduate, Spring 2013.

Jane Fomina, Boston University undergraduate, May 2011- May 2012.

Josh Cole, Boston University undergraduate, Summer 2011.

Byung Joon Park, Johns Hopkins University undergraduate, Summer 2009.

Kevin Rhee, Johns Hopkins University undergraduate, Fall 2008 - Spring 2009.

Andy (Pingyang) Liu, University of Hong Kong undergraduate, Summer 2008.

AWARDS

Fellow, Cross-disciplinary Training Program in Cancer Nanotechnology, 2012

Carlson Award, Johns Hopkins University, 2004

Honorable Mention, NSF Graduate Fellowship, 2004

Honorable Mention, Goldwater Scholarship, 2003

Phi Beta Kappa, College of Wooster, 2003

COMPUTATIONAL SKILLS

Experience includes molecular modeling using CHARMM scripts, structure prediction using Rosetta, common x-ray crystallography programs (CNS, COOT, O, CCP4), Python (for data analysis) and Biopython (for bioinformatics).