

DR. SARAH HABERLIN LAWRENCE

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Objective: A tenure-track faculty appointment in the chemistry or biochemistry department of a small to medium institution with a strong commitment to teaching, a robust environment for conducting student-involved research, and opportunities for scientific outreach in the community.

Education

- Ph.D. in Biochemistry and Molecular Biology – The Pennsylvania State University (PSU) (2005)
University Park, PA
 - Dissertation – Structural and Mechanistic Investigations of Acetate Kinase and Phosphotransacetylase from *Methanosarcina thermophila*
 - Thesis Advisor – Professor James G. Ferry
- B.S. in Cellular Biology with high honors – Saint Vincent College, Latrobe, PA (2000)
 - Minor in Biochemistry

Employment

- Post-doctoral Research Fellow – Fox Chase Cancer Center (2005-present)
- Graduate Research Assistant – PSU (2000-2005)
- Graduate Teaching Assistant – PSU (2000-2002)
- Undergraduate Research Assistant – Duquesne University, Pittsburgh, PA (Summer 1999)
 - Analyzed assimilatory selenate reduction by *Sulfurospirillum barnesii* SES-3.
- Undergraduate Research Assistant – University of Pittsburgh, Pittsburgh, PA (Summer 1997)
 - Studied interspecies competition of *Solidago sp.* at the NSF Long Term Ecological Research Station in East Bethel, MN.

Teaching

- Guest Lecturer – Separation and Purification Strategies for Biotechnology Products, a PSU biotechnology training program (2003-2005)
- Guest Lecturer – Astrobiology: The Origins and Early Evolution of Life, a PSU workshop for science teachers (2002-2005)
- Supervised training and research of beginning graduate students, PSU (2002-2005)
- Graduate Teaching Assistant – Proteins and Enzymology Lab, BMB443W, PSU (2001)
- Graduate Teaching Assistant – Carbohydrates and Lipids Lab, BMB444, PSU (2001)
- Undergraduate Teaching Assistant – Advanced Cellular Biology, BL218/219, Saint Vincent College (2000)
- Undergraduate Teaching Assistant – General Chemistry Lab, CH103, Saint Vincent College (2000)

Honors

- Outstanding Abstract Submission Award (2008)
4th Modern Drug Discovery & Development Summit, San Diego, CA
- Fox Chase Cancer Center NIH Institutional Training Grant Awardee (2005-2008)
- Stanley Person Graduate Fellowship (2003-2005)
- Paul M. Althouse Teaching Assistant Award – Honorable Mention (2001)
- Braddock-Roberts Graduate Fellowship (2000)
- A.J. Palumbo Undergraduate Research Fellowship (1999)
- Research Experience for Undergraduates Fellowship (1999)

Professional Affiliations

- American Chemical Society
- American Society for Biochemistry and Molecular Biology
- American Society for Microbiology
- The Protein Society

Publications

1. T. Selwood, U.D. Ramirez, **S.H. Lawrence**, L. Stith, E.K. Jaffe. *Manuscript in preparation*. Species specific stabilization of the hexameric assembly of human porphobilinogen synthase.
2. B. Kokona, D.J. Rigotti, A.S. Wasson, **S.H. Lawrence**, F. Fazliyez, E.K. Jaffe, R. Fairman. 2008. Probing the oligomeric assemblies of pea porphobilinogen synthase, *Biochemistry*. *47*(40), 10649-56.
3. **S.H. Lawrence**, E.K. Jaffe. 2008. Morpheesins – Expanding the concepts in protein structure-function relationships and enzyme kinetics: Teaching using morpheesins, *BAMBED*. *34*(4), 274-283.
4. **S.H. Lawrence***, U.D. Ramirez*, L. Tang, F. Fazliyez, L. Kundrat, G.D. Markham, and E.K. Jaffe. 2008. Shape shifting leads to small molecule allosteric drug discovery, *Chem. Biol*. *15*(6), 586-596.
5. T. Selwood, L. Tang, **S.H. Lawrence**, Y. Anokhina, E.K. Jaffe. 2008. Kinetics and thermodynamics of the interchange of the morpheein forms of human porphobilinogen synthase, *Biochemistry*. *47*(10), 3245-57.
6. **S.H. Lawrence**, J.G. Ferry. 2006. Steady-state kinetic analysis of phosphotransacetylase from *Methanosarcina thermophila*. *J. Bact.* *188*(3), 1155-1158.
7. **S.H. Lawrence**, K.B. Luther, H. Schindelin, J.G. Ferry. 2006. Structural and functional studies suggest a catalytic mechanism for the phosphotransacetylase from *Methanosarcina thermophila*. *J. Bact.* *188*(3), 1143-1154.
8. A. Gorrell, **S.H. Lawrence**, J.G. Ferry. 2005. Structural and kinetic analyses of arginine residues in the active site of acetate kinase from *Methanosarcina thermophila*. *J. Biol. Chem.* *280*(11), 10,731-10,742.
9. C.S. Ingram-Smith*, A. Gorrell*, **S.H. Lawrence**, P.P. Iyer, K.S. Smith, J.G. Ferry. 2005. Characterization of the acetate binding site in the *Methanosarcina thermophila* acetate kinase. *J. Bact.* *187*(7), 2386-2394.
10. **S.H. Lawrence***, P.P. Iyer*, K.B. Luther, K.R. Rajashankar, H.P. Yennawar, J.G. Ferry, H. Schindelin. 2004. Crystal structure of phosphotransacetylase from the methanogenic archaeon *Methanosarcina thermophila*. *Structure*. *12*, 1-20.
11. P.P. Iyer, **S.H. Lawrence**, H.P. Yennawar, J.G. Ferry. 2003. Expression, purification, crystallization and preliminary X-ray analysis of phosphotransacetylase from *Methanosarcina thermophila*. *Acta Crystallogr. D Biol. Crystallogr.* *59*, 1517-1520.

(*) denotes co-first authors.

Presentations

- 1. S.H. Lawrence**, U.D. Ramirez, L. Tang, F. Fazliyez, L. Kundrat, G.D. Markham, and E.K. Jaffe. 2008. Shape shifting leads to small molecule allosteric drug discovery. Poster, 4th Modern Drug Discovery Summit, San Diego, CA, October 2008.
- 2. S.H. Lawrence**, E.K. Jaffe. 2008. Morpheesins – Expanding the concepts in protein structure-function relationships and enzyme kinetics: Teaching using morpheesins. Poster, 236th American Chemical Society National Meeting, Philadelphia, PA, August 2008.
- 3. S.H. Lawrence**, U.D. Ramirez, L. Tang, F. Fazliyez, L. Kundrat, G.D. Markham, and E.K. Jaffe. 2008. Shape shifting leads to small molecule allosteric drug discovery. Poster, 236th American Chemical Society National Meeting, Philadelphia, PA, August 2008.
- 4. S.H. Lawrence**, E.K. Jaffe. 2008. Morpheesins – Expanding the concepts in protein structure-function relationships and enzyme kinetics: Teaching using morpheesins. Poster, Gordon Research Conference on Enzymes, Cofactors and Metabolic Pathways, Biddeford, ME, August 2008.
- 5. S.H. Lawrence**, U.D. Ramirez, G.D. Markham, E.K. Jaffe. Phylogenetic metal variations as a predictor of species-specific porphobilinogen synthase druggability. 2006. Poster, Frontiers in Metallobiochemistry Symposium, University Park, PA, June 2006.
- 6. S.H. Lawrence**, U.D. Ramirez, G.D. Markham, E.K. Jaffe. Exploiting alternate enzyme oligomers for drug discovery: *in silico* docking identifies a structure-based inhibitor for porphobilinogen synthase. 2006. Poster, Gordon Research Conference on Chemistry & Biology of Tetrapyrroles, Newport, RI, July 2006.
- 7. S.H. Lawrence**, K.B. Luther, H. Schindelin, J.G. Ferry. 2004. Structural and mechanistic examination of phosphotransacetylase from *Methanosarcina thermophila*. Poster, 228th American Chemical Society National Meeting, Philadelphia, PA, August 2004.
- 8. S.H. Lawrence**, K.B. Luther, H. Schindelin, J.G. Ferry. 2004. Structure-based investigation of the *Methanosarcina thermophila* catalytic mechanism. Poster, Gordon Research Conference on Enzymes, Cofactors and Metabolic Pathways, Meriden, NH, August 2004.
- 9. S.H. Lawrence**, J.G. Ferry. 2003. Structural and mechanistic studies of phosphotransacetylase from the methanogenic archaeon, *Methanosarcina thermophila*. Poster, Gordon Research Conference on Archaea: Ecology, Metabolism and Molecular Biology, Andover, NH, August 2003.
- 10. S.H. Lawrence**, J.G. Ferry. 2003. Structural and mechanistic characterization of phosphotransacetylase. Poster, 18th Annual PSU Graduate Exhibition, University Park, PA, March 2003.
- 11. S.H. Lawrence**, B.B. Bethke. 2000. Examination of IGF-1 as an effector of P-glycoprotein mediated multi-drug resistance in human colorectal cells. Poster, Saint Vincent College Undergraduate Research Symposium, Latrobe, PA, May 2000.
- 12. S.H. Lawrence**, J.F. Stolz. 1999. Kinetics of selenate and nitrate reduction in *Sulfurospirillum barnesii*. Oral presentation, Duquesne University Undergraduate Research Symposium, Pittsburgh, PA, August 1999.

References

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