

# Paul B. Lawrence

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## Education

*Harvard BOK Higher Education Teaching Certificate, 2019*

*Brigham Young University-Provo, 2011-2016*

Ph.D. in Chemistry, emphasis in Organic Chemistry

Thesis: "Criteria for Selecting PEGylation Sites on Proteins for Higher Thermodynamic and Proteolytic Stability"

Advisor: Joshua L. Price

*Utah Valley University, 2005-2011*

B.S. in Forensic Chemistry

B.S. in Forensic Science

## Experience

*Chemistry Lecturer, University of Central Florida, 2022-present*

- Organic Chemistry 1&2
- Biochemistry 1
- Organic Lab Techniques 1 Coordinator

*Adjunct Professor of Chemistry, Fei Tian College, 2020-present*

- Organic Chemistry (hybrid course/flipped classroom)
- Biochemistry

*Adjunct Professor of Chemistry, Georgia Military College, 2020-2023*

- Online General Chemistry

*Assistant Professor of Chemistry, Keystone College-La Plume, 2018-2022*

- Courses taught: General Chemistry 1 & 2 and labs, Organic Chemistry 1 & 2 lecture and labs, Forensic Chemistry, General Biology lab, and Biotechnology
- Prepared online lectures
- Mentored students
- Committee Work
- Designed undergraduate research projects
- Developed the New Chemistry Major

*Postdoc Research Associate, University of Washington-Seattle, 2016-2018*

- Successfully refolded full-length human p53 S37C mutant, which was first purified to homogeneity under denaturing conditions. Activity was confirmed by DNA-binding assays and *in vitro* transcription assays performed in collaboration with the Roeder Lab at Rockefeller University
- Generated p53 protein thioester for the semi-synthesis of full-length post-translationally modified p53.
- Synthesized p53 phosphorylated peptides for the semi-synthesis of full-length p53 protein.
- Designed and cloned DNA for successful overexpression of p53 protein variants.

*Research Assistant, Brigham Young University-Provo, 2011-2016*

- Developed structure-based method for predicting stabilizing PEGylation sites in peptides.
- Designed, synthesized and characterized WW domain AsnPEG<sub>4</sub> variants.
- Designed, synthesized and characterized chicken Src SH3 domain AsnPEG<sub>4</sub> variants.
- Designed projects for and mentored undergraduate coworkers

*Teaching Assistant, Brigham Young University-Provo, 2011-2015*

- Prepared and delivered lectures, weekly recitation sessions, grading quizzes/tests, and tutoring in the chemistry tutor lab

*Intern, Utah State Crime Lab, Salt Lake City, 2009*

- Prepared reagents, created standards, tested reagents, drug identification, created calibration curves, and calibrated instruments.

*Foreman, Custom Cabinet Design, Bluffdale, 2002-2010*

- Built and installed custom kitchen cabinets, built custom furniture, and supervised a team of up to five employees.

## **Skills**

- Protein overexpression, purification, and orbitrap characterization of proteins.
- Gibson assembly and Q5 site-directed mutagenesis of DNA.
- RP-HPLC, FPLC
- DNA binding assays.
- Solid-phase synthesis (manual, microwave-assisted), HPLC purification, and MALDI-TOF characterization of peptides.
- Biophysical characterization of peptide structures by circular dichroism.
- Synthesis, chromatographic purification, and spectroscopic characterization of unnatural amino acids.
- Synthesis, chromatographic purification, and spectroscopic characterization of  $\beta$ -3-D-homoornithine.
- Synthesis of functionalized PEG (polyethylene glycol) molecules.
- Proteolysis experiments.
- Designed courses in Moodle.
- Excel, Word, PowerPoint, and Adobe Illustrator.

## **Activities, Awards, and Fellowships**

- Charles E and Margaret P Maw graduate fellowship, 2015-2016
- 1<sup>st</sup> place winner at BYU 2013 student research conference
- Utah Valley University: 3.82 accumulative GPA
- Ds - Science And Health Scholarship
- Ds- Technology and Computing Scholarship
- Internship Scholarship
- AIM HIGH, 2023

## Publications

1. Pandey, B. K.; Smith, M. S.; Torgerson, C.; **Lawrence, P. B.**; Matthews, S. S.; Watkins, E.; Groves, M. L.; Prigozhin, M. B.; Price, J. L., Impact of site-specific PEGylation on the conformational stability and folding rate of the Pin WW domain depends strongly on PEG oligomer length. *Bioconjugate chemistry* 2013, 24 (5), 796-802.
2. **Lawrence, P. B.**; Gavrilov, Y.; Matthews, S. S.; Langlois, M. I.; Shental-Bechor, D.; Greenblatt, H. M.; Pandey, B. K.; Smith, M. S.; Paxman, R.; Torgerson, C. D.; Merrell, J. P.; Ritz, C. C.; Prigozhin, M. B.; Levy, Y.; Price, J. L., Criteria for Selecting PEGylation Sites on Proteins for Higher Thermodynamic and Proteolytic Stability. *JACS* 2014, 136 (50), 17547-17560.
3. **Lawrence, P. B.**; Billings, W. M.; Miller, M. B.; Pandey, B. K.; Stephens, A. R.; Langlois, M. I.; Price, J. L., Conjugation Strategy Strongly Impacts the Conformational Stability of a PEG-Protein Conjugate. *ACS Chem. Biol.* 2016, 11 (7), 1805-1809.
4. **Lawrence, P. B.**; Price, J. L., How PEGylation influences protein conformational stability. *Curr. Opin. Chem. Biol.* 2016, 34, 88-94.
5. Steven R. E. Draper, **Paul B. Lawrence**, Wendy M. Billings, Qiang Xiao, Nathaniel P. Brown, Natalie A. Bécar, Derek J. Matheson, Andrew R. Stephens, and Joshua L. Price., Polyethylene Glycol Based Changes to  $\beta$ -Sheet Protein Conformational and Proteolytic Stability Depend on Conjugation Strategy and Location. *Bioconjugate Chemistry*. 2017 28 (10), 2507-2513.

## Presentations

1. 2009 UCUR poster session "Characterization of the Painted Lubricant Coating on Barnes XLC Coat Bullets"
2. Lawrence, P.B., Price, J.L. Stabilizing Impact of PEGylation on the WW Domain Strongly Depends on the Identity of the Protein-PEG linker. Poster session at Peptides Gordon Research Conference 2016, Feb 21-26; Ventura, CA.

## Conferences Attended

1. Gordon Peptide Conference 2016, Ventura California
2. The American Academy of Forensic Science 2019, Baltimore Maryland