Kellye A. Cupp-Sutton

Postdoctoral Researcher
kellyecuppsutton@gmail.com
Department of Chemistry and Biochemistry

EDUCATION

2009 – 2013
Bachelor of Science | Chemistry - ACS, University of Central Oklahoma, Edmond, OK

2014 – 2018
Doctor of Philosophy | Chemistry, University of Oklahoma, Norman, OK
Advisor: Dr. Michael T Ashby

PROFESSIONAL EXPERIENCE

Graduate research/teaching assistant, University of Oklahoma, Norman, OK 2014-2018
University of Oklahoma | Norman, OK
Research under the supervision of Dr. Michael Ashby involving the kinetics and mechanism of lactoperoxidase catalysis using stopped-flow time-resolved UV-Vis kinetics techniques. First author on an invited review article and a research manuscript.

- Research the kinetic mechanism by which lactoperoxidase catalyzes the oxidation of pseudohalides by hydrogen peroxide
- Undergraduate instructor: Instrumental Analysis Laboratory (Instructor of Record), Advanced Synthesis Laboratory, Quantitative Analysis Laboratory (Head Teaching Assistant), General Chemistry Laboratory I/II

Postdoctoral Researcher 2019 – Present
University of Oklahoma | Norman, OK
Research focused on top-down proteomics, mass spectrometry, and drug-target analysis. Author on multiple academic research articles and an invited review article.

- Research activities
    - Quantitative high-throughput top-down proteomics
    - Top-down thermal proteome profiling (TD-TPP) development and applications to drug-target analysis and complex systems
    - Intact stability of proteins from rates of oxidation (SPROX) development and application to drug-target analysis and complex protein mixtures
    - High-throughput hydrogen-deuterium exchange mass spectrometry (HDX-MS) data analysis

SELECTED PUBLICATIONS

- **Cupp-Sutton, K.A.**, Fang, M, Wu, S. (2022) Separation methods in single-cell proteomics: RPLC or CE? International Journal of Mass Spectrometry. (Young Scientist Feature, Submitted)
- Guo, Y, Yu, D, **Cupp-Sutton, K.A**., Liu, X, Wu, S. (2022) Optimization of protein-level tandem mass tag (TMT) labeling conditions in complex samples with top-down proteomics. Analytica Chimica Acta. 1221: 340037.
- **Cupp-Sutton, K.A.**, Ashby, M. T. (2021) Reverse Ordered Sequential Mechanism for Lactoperoxidase with Inhibition by Hydrogen Peroxide. Antioxidants. 10(11):1646.
- Huang, L., Fang, M., **Cupp-Sutton, K.A.**, Wang, Z., Smith, K., and Wu, S. (2021) Spray-capillary based capillary electrophoresis mass spectrometry for metabolite analysis in single live cells. Analytical Chemistry. 2021 Mar 16;93(10):4479-4487.
- Yu, D., Wang, Z., Kou, Q., **Cupp-Sutton, K.A.**, Smith, K., Liu, X., and Wu, S. (2021) Quantitative top-down proteomics in complex samples using protein-level tandem mass tag (TMT) labeling. Journal of the American Society for Mass Spectrometry. 32(6): 1336-1344.
- **Cupp-Sutton, K.A.**, Wang, Z., Yu, D., and Wu, S. (2020) RPLC-RPLC-MS/MS for proteoform identification. Proteoform Identification. Methods and Protocols in Methods in Molecular Biology. 2500: 31-42.
- Fang, M., Wang, Z., **Cupp-Sutton, K.A.**, Welborn T., Smith, K., and Wu, S. (2020) High-throughput hydrogen deuterium exchange mass spectrometry (HDX-MS) coupled with subzero temperature ultrahigh pressure liquid chromatography (UPLC) separation for complex sample analysis. Analytica Chimica Acta. 1143: 65-72.
- Wang, Z., Yu, D., Liu, X., **Cupp-Sutton, K.A.**, Smith, K., and Wu, S. (2020) Development of an Online 2D Ultrahigh-Pressure Nano-LC System for High-pH and Low-pH Reversed Phase Separation in Top-Down Proteomics. Analytical Chemistry. 92(19):12774-12777.
- **Cupp-Sutton, K.A.**, and Wu, S. (2020) *High-throughput Quantitative Top-Down Proteomics.* Molecular Omics. 16(2): 91-99. (Invited Review)
- Huang, L., Wang, Z., **Cupp-Sutton K.A.**, Smith, K., Wu, S. (2019) *Spray-Capillary: An Electrospray Assisted Device for Quantitative Ultra-Low Volume Sample Handling*. Analytical Chemistry.
- Yu, D., Wang, Z., Kou, Q., **Cupp-Sutton, K.A**., Smith, K., Liu, X., and Wu, S. (2019) *Deep Intact Proteoform Characterization in Human Cell Lysate using High-pH and Low-pH Reversed Phase Liquid Chromatography*. JASMS.
- Cupp-Sutton K. A., and Ashby M. T. (2016) *Biological Chemistry of Hydrogen Selenide*. Antioxidants (5) 42. (Invited Review)

SELECTED RESEARCH PRESENTATIONS

- *Reverse Ordered Sequential Mechanism for Lactoperoxidase with Inhibition by Hydrogen Peroxide.* **Kellye A Cupp-Sutton** and Michael T. Ashby. (2019) 11th International Human Peroxidase Meeting. Brno, Czech Republic. (Poster presentation)
- *Direct thermal proteome profiling using quantitative top-down proteomics*. **Kellye A Cupp-Sutton**, Zhe Wang, and Si Wu. (2019) ASMS. Atlanta, GA. (Poster)
- *Top-Down Thermal Proteome Profiling of the E. Coli Proteome for Drug Target Identification*. **Kellye A Cupp-Sutton**, Zhe Wang, and Si Wu. (2019) 2019 Designing Molecules Workshop and Conference. Manhattan, KS. (Poster)

- *Quantification of Thermal Stability of Intact Proteoforms Using Quantitative Top-Down Proteomics.* **Kellye A Cupp-Sutton**, Thomas Welborn, Si Wu. (2020) 68th ASMS annual conference Reboot. (Oral Presentation)
- *Quantitative Top-down Thermal Proteome Profiling of E. coli lysate and Standard Proteins.* **Kellye A Cupp-Sutton**, Ji Kang, Thomas Welborn, Si Wu. (2021) 17th USHUPO Virtual Annual Conference. (Poster; Selected for Lightning Talk)
- *Development and Application of Quantitative Top Down Mass Spectrometry Methods*. **Kellye A Cupp-Sutton**, Si Wu. 69th ASMS Conference on Mass Spectrometry and Allied Topics, October 31- November 4, 2021. (Oral Workshop Presentation)
- *Adaptation of Top-down Thermal Proteome Profiling for the Analysis of the Thermal Stability of the Human Proteome*. **Kellye A Cupp-Sutton**, Yanting Guo, Trishika Chowdhury, Ji Kang, Si Wu. 69th ASMS Conference on Mass Spectrometry and Allied Topics, October 31- November 4, 2021. (Poster)
- *Application of Top-Down Thermal Proteome Profiling to the analysis of Staurosporine Treated HeLa proteome stability.* **Kellye A Cupp-Sutton**, Yanting Guo, Trishika Chowdhury, Ji Kang, Si Wu. US HUPO 2022 One World, February 26 – March 2, 2022 (Oral presentation)
- *Isobaric Labeling Based Top-Down Thermal Proteome Profiling (TD-TPP) for Proteome Scale Drug Target Characterization.* **Kellye A Cupp-Sutton,** Yanting Guo, Trishika Chowdhury, Walter Galie, Si Wu. 70th ASMS Conference on Mass Spectrometry and Allied Topics, June 5- 9, 2021.

Mentoring

- Mentored an undergraduate student that developed a plate-based assay for SDS quantiation. He currently aims to develop a combined thermal proteome profiling (TPP)/HDX-MS platform for the elucidation of drug mechanism-of-action in cell lysate. This research has been presented at OU undergraduate research day (2021 and 2022), and the annual American Society for Mass Spectrometry conference (2022).
- Mentored an undergraduate student for a that aims to develop a 3D-printed, reusable gel-eluted liquid fraction entrapment electrophoresis cartridge for size-based prefractionation of complex protein mixtures for top-down proteomics. This research was presented at LSAMP (2021) and the annual American Society for Mass Spectrometry conference (2022).
- Mentor a graduate student that aims to adapt and apply top-down proteomics methods to the analysis of biological pathways and drug mechanism including kinase inhibitors for cancer treatment and induced pluripotent stem cell differentiation. This research was presented at the annual American Society for Mass Spectrometry conference (2022).
- Mentor a graduate student that aims to adapt stability of proteins from rates of oxidation (SPROX) for high-throughput analysis of intact protein mixtures. This research was presented at OU's 10th Annual Symposium on Structural Biology (2022).

Community Outreach

- Moderator, ACS Measurement Science Symposium 2021
- Judge and moderator, Undergraduate Research Day 2021 and 2022

- Course developer and lecturer, OU Mini college for K-12 students “What is a protein?” 2021

Professional Membership

- ASMS
- US HUPO
- HUPO