

Kenneth W. Lee
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ACADEMIC EMPLOYMENT

Assistant Professor

Department of Chemistry and Biochemistry
Brigham Young University, Provo, UT
July 2023 – Present

Staff Scientist

Advisor: Dr. Joshua Coon
Department of Biomolecular Chemistry
University of Wisconsin-Madison, Madison, WI
July 2022 – July 2023

Postdoctoral Researcher

Advisor: Dr. Joshua Coon
Department of Biomolecular Chemistry
University of Wisconsin-Madison, Madison, WI
January 2021 – June 2022

EDUCATION

Doctor of Philosophy, Analytical Chemistry

Development of a 3D Ion Trap for Ion/Ion Reactions and Mass Analysis Involving High Mass Biomolecular Ions

Advisor: Dr. Scott McLuckey
Department of Chemistry
Purdue University, West Lafayette, IN
August 2016 – December 2020

Bachelor of Science, Chemistry

Department of Chemistry and Biochemistry
Brigham Young University, Provo, UT
August 2010 – April 2011, January 2014 – April 2016

PUBLICATIONS

Peters-Clarke, Trenton M.; Liang, Yiran; Mertz, Keaton L.; Lee, Kenneth W.; Westphall, Michael S.; Hinkle, Joshua D.; McAlister, Graeme C.; Syka, John E.P.; Kelly, Ryan T.; Coon, Joshua J. Boosting the Sensitivity of Quantitative Single-Cell Proteomics with Infrared-Tandem Mass Tags. *J. Proteome Res.* **2024**, XXXXXXXXX.

Anderson, Thomas K.; Hoferle, Peter J.; Chojnacki Kennan J.; Lee, Kenneth W.; Coon, Josh J.; Kirchdoerfer, Rober N. An alphacoronavirus polymerase structure reveals conserved replication factor functions. *Nucleic Acids Res.* **2024**, 52, 5975-5986.

Westphall, Michael S.; Lee, Kenneth W.; Salome, Austin Z.; Coon, Joshua J; Grant, Timothy. Mass spectrometers as cryoEM grid preparation instruments. *Curr. Opin. Struct. Biol.* **2023**, 83, 102699.

Westphall, Michael S.; Lee, Kenneth W.; Hemme, Colin; Salome, Austin Z.; Mertz, Keaton; Grant, Timothy; Coon, Joshua J. Cryogenic Soft Landing Improves Structural Preservation of Protein Complexes. *Anal. Chem.* **2023**, 95(40), 15094-15101.

Lee, Kenneth W.; Salome, Austin Z.; Westphall, Michael S.; Grant, Timothy; Coon, Joshua J. Onto Grid Purification and 3D Reconstruction of Protein Complexes Using Matrix-Landing Native Mass Spectrometry. *J. Proteome Res.* **2023**, 22(3), 851-856.

Salome, Austin Z.; Lee, Kenneth W.; Grant, Timothy; Westphall, Michael S.; Coon, Joshua J. Matrix-Landing Mass Spectrometry for Electron Microscopy Imaging of Native Protein Complexes. *Anal. Chem.* **2022**, 94(50), 17616-17624.

Westphall, Michael S.; Lee, Kenneth W.; Salome, Austin Z.; Lodge, Jean M.; Grant, Timothy; Coon, Joshua J. Three-dimensional structure determination of protein complexes using matrix-landing mass spectrometry. *Nature communications.* **2022**, 13(1), 1-6.

Chao, Hsi-Chun; Lee, Kenneth W.; Shih, Mack; McLuckey, Scott A. Characterization of Homopolymer Distributions via Direct Infusion ESI-MS/MS using Wide Mass-to-Charge Windows and Gas-Phase Ion/Ion Reactions. *Journal of the American Society for Mass Spectrometry.* **2022**, 33(4), 704-713.

Lee, Kenneth W.; Peters-Clarke, Trenton M.; Mertz, Keaton L.; McAlister, Graeme C.; Syka, John E.P.; Westphall, Michael S.; Coon, Joshua J. Infrared Photoactivation Boosts Reporter Ion Yield in Isobaric Tagging. *Analytical Chemistry.* **2022**, 94(7), 3328-3334.

Pitts-McCoy, Anthony M.; Abdillahi, Abdirahman M.; Lee, Kenneth W.; McLuckey, Scott A. Multiply Charged Cation Attachment to Facilitate Mass Measurement in Negative-Mode Native Mass Spectrometry. *Analytical Chemistry.* **2022**, 94(4), 2220-2226.

Abdillahi, Abdirahman M.; Lee, Kenneth W.; McLuckey, Scott A. Mass Analysis of Macromolecular Analytes via Multiply-Charged Ion Attachment. *Analytical Chemistry.* **2020**, 92(24), 16301-16306.

Lee, Kenneth W.; Harrilal, Christopher P.; Fu, Liangxuan; Eakins, Gregory S.; McLuckey, Scott A. Digital ion trap mass analysis of high mass protein complexes using IR activation coupled with ion/ion reactions. *International Journal of Mass Spectrometry.* **2020**, 458, 116437.

Lee, Kenneth W.; Eakins, Gregory S.; Carlsen, Mark S.; McLuckey, Scott A. Ion trap operational modes for ion/ion reactions yielding high mass-to-charge product ions. *International Journal of Mass Spectrometry.* **2020**, 451, 116313.

Foreman, David J.; Bhanot, Jay S.; Lee, Kenneth W.; McLuckey, Scott A. Valet Parking for Protein Ion Charge State Concentration: Ion/Molecule Reactions in Linear Ion Traps. *Analytical Chemistry*. **2020**, 92(7), 5419-5425.

Lee, Kenneth W.; Eakins, Gregory S.; Carlsen, Mark S.; McLuckey, Scott A. Increasing the Upper Mass/Charge Limit of a Quadrupole Ion Trap for Ion/Ion Reaction Product Analysis via Waveform Switching. *Journal of the American Society for Mass Spectrometry*. **2019**, 30(6), 1126-1132.

Johnson, Joshua T.; Lee, Kenneth W.; Bhanot, Jay S.; McLuckey, Scott A. A Miniaturized Fourier Transform Electrostatic Linear Ion Trap Mass Spectrometer: Mass Range and Resolution. *Journal of the American Society for Mass Spectrometry*. **2019**, 30(4), 588-594.

Dziekonski, Eric T.; Johnson, Joshua T.; Lee, Kenneth W.; McLuckey, Scott A. Determination of Collision Cross Sections Using a Fourier Transform Electrostatic Linear Ion Trap Mass Spectrometer. *Journal of the American Society for Mass Spectrometry*. **2018**, 29(2), 242-250.

Dziekonski, Eric T.; Johnson, Joshua T.; Lee, Kenneth W.; McLuckey, Scott A. Fourier-Transform MS and Closed-Path Multireflection Time-of-Flight MS Using an Electrostatic Linear Ion Trap. *Analytical Chemistry*. **2017**, 89(20), 10965-10972.

CONFERENCES

Lee, Kenneth W.; Salome, Austin Z.; Westphall, Michael S.; Grant, Timothy; Coon, Joshua J. "Structural analysis of manipulated and landed protein complexes." Oral Presentation, June 6, Proceedings of the 69th ASMS Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN, June 5–9, 2022.

Lee, Kenneth W.; Salome, Austin Z.; Lodge, Jean M.; Grant, Timothy; Westphall, Michael S.; Coon, Joshua J. "Probing the structure of soft-landed protein complexes." Oral Presentation, November 3, Proceedings of the 69th ASMS Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA, October 31–November 4, 2021.

Lee, Kenneth W.; Harrilal, Christopher P.; Fu, Liangxuan; Eakins, Gregory S.; McLuckey, Scott A. "Improving mass measurements of protein complexes through IR activation coupled with charge reduction ion/ion reactions." Oral Presentation, TOH pm, June 2, Proceedings of the 68th ASMS Conference on Mass Spectrometry and Allied Topics, Online Reboot, June 1–12, 2020.

Lee, Kenneth W.; Eakins, Gregory S.; Carlsen, Mark S.; McLuckey, Scott A., "Increasing the Mass Range of Ion-Ion Reactions in a Quadrupole Ion Trap with Waveform Switching." Poster Presentation, MP 487, June 2, Proceedings of the 67th ASMS Conference on Mass Spectrometry and Allied Topics, Atlanta, GA, June 2–6, 2019.

TEACHING EXPERIENCE

Assistant Professor

Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT
Chem 106: General College Chemistry 2, Fall 2023

Teaching Assistant

Department of Chemistry, Purdue University, West Lafayette, IN
CHM 11100: General Chemistry 1, Fall 2016
CHM 37401: Physical Chemistry Laboratory, Spring 2017
CHM 11500: General Chemistry 1 (for Engineering students), Fall 2017

Teaching Assistant

Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT
Chem 111: Principles of Chemistry 1, Fall 2014
Chem 101 & 105: Exploratory Lab Section, Winter 2015
Chem 112: Principles of Chemistry 2, Winter 2016

COMMITTEE/SERVICE

Chemistry and Biochemistry Graduate Student Recruitment

Brigham Young University, Provo, UT
July 2023 – Present
Graduate School Info Session, Brigham Young University, Provo, UT, November 16, 2023
Research and Recruitment Seminar, Utah Tech University, St. George, UT, December 8, 2023

RESEARCH EXPERIENCE

Research Assistant

Fabrication of nanoscale devices using DNA origami

Advisor: Dr. Adam Woolley
Brigham Young University, Provo, UT
August 2010 – April 2011, January 2014 – April 2016

OUTREACH ACTIVITY

Wednesday Nite @ The Lab

Science Outreach on Campus, University of Wisconsin-Madison, Madison, WI
“Studying Protein Structures in a Space-like Environment: Integration of Mass Spectrometry and Electron Microscopy for Structural Biology.” Oral Presentation, June 15, 2022

AWARDS AND HONORS

W. Brooks Fortune Fellowship

Purdue University, West Lafayette, IN
Fall 2017

Ross Fellowship

Purdue University, West Lafayette, IN
Fall 2016 – Spring 2017

Dean's List

Brigham Young University, Provo, UT
Winter 2014

Undergraduate Research Award

Brigham Young University, Provo, UT
Winter 2014, Spring/Summer 2014, Fall 2014,
Winter 2015, Spring/Summer 2015, Fall 2015,
Winter 2016

SKILLS**Programming and Electric Engineering Education**

Brigham Young University, Provo, UT
CS 142: Introduction to Computer Programming, Winter 2014
EC EN 301: Elements of Electrical Engineering, Spring 2015
CS 235: Data Structures and Algorithms, Winter 2016

Instrumentation Expertise

Mass Spectrometry – home-built and commercial instrument modification
Transmission Electron Microscopy – negative-stain and cryo-EM imaging

Programming Expertise

C++ – object-oriented programming and data structures
R – data analysis and calculations/models of chemical processes
Python – calculations/models and user interfaces
Lua – ion physics modeling with SIMION and control of commercial instrumentation
Arduino (C) – microcontroller programming

Software Expertise

SIMION – mass spectrometer and ion physics modeling
Autodesk Inventor – mass spectrometer hardware design

Electrical Engineering Experience

Design and development of an analytical instrument controller