Dr. Daniel N. Mortensen, Ph.D.
Brigham Young University
Department of Chemistry and Biochemistry
C100 Benson Science Building, Provo, UT 84602-5700
Office Phone: (801) 422-7123
Email: dnmort@chem.byu.edu

Academic Appointments

Assistant Professor of Chemistry, Brigham Young University, March 2017—August 2021.

Director—Biological Mass Spectrometry Core Facility, Brigham Young University, March 2017— August 2021.

Director—Cell Sorter Core Facility, Brigham Young University, March 2017—August 2021.

Education

Postdoctoral: Brigham Young University, 2016—2017
Advisor: David V. Dearden

Ph.D.: Chemistry, University of California, Berkeley, 2011—2016
Advisor: Evan R. Williams

B.S.: Chemistry, Brigham Young University, 2009—2011
Advisor: David V. Dearden

Courses Taught

CHEM 223 (Quantitative and Qualitative Analysis, 4 credits)
I taught this course Fall semester 2017 (enrollment: 29 students)
I taught this course Spring 2018 (13 students)
I taught this course Fall 2018 (28 students)
I taught this course Spring 2019 (12 students)
I taught this course Fall 2019 (31 students)
I taught this course online Spring 2020 (31 students)
I taught this course online/in-person Fall 2020 (28 students)
I taught this course Spring 2021 (15 students)

CHEM 105 (General College Chemistry 1 with Lab (Integrated), 4 credits)
I taught this course Winter 2020 (245 students)
I taught this course Winter 2021 (281 students)

Professional Committees

Mass spectrometry committee (Brigham Young University, 2017-2019)—This committee was responsible for maintaining mass spectrometry equipment within the Department of Chemistry and Biochemistry. I was chair of this committee from 2018 to 2019.

Major instruments committee (Brigham Young University, 2019-2021)—This committee maintains all core facility equipment within the Department of Chemistry and Biochemistry. I have chaired this committee since its formation in 2019.

Central Utah Section of the American Chemical Society (2021)—I am currently serving as treasurer of this section of the ACS.

Peer-Reviewed Publications

"Multi-CRAFTI: Relative Collision Cross Sections from Fourier Transform Ion Cyclotron Resonance Mass Spectrometric Line Width Measurements." B. Pope, D. Joaquin, J. Hickey, N. Mismash, T. Heravi, J. Shrestha, A. Arslanian, A. Anupriya, D. N. Mortensen, D. V. Dearden. Submitted to *Journal of the American Society for Mass Spectrometry* **2021**.

"Analysis of thrombin-antithrombin complex formation using microchip electrophoresis and mass spectrometry." J. B. Nielsen, A. V. Nielsen, R. H. Carson, H. J. L. Lin, R. L. Hanson, M. Sonker, D. N. Mortensen, J. C. Price, A. T. Woolley. *Electrophoresis*, **2019**, 0, 1-7.

"Barriers for Extrusion of a Guest from the Interior Binding Cavity of a Host: Gas Phase Experimental and Computational Results for Ion-Capped Decamethylcucurbit[5]uril Complexes." S. M. Hickenlooper, C. C. Harper, B. L. Pope, D. N. Mortensen, D. V. Dearden. *J. Phys. Chem. A*, **2018**, 122, 9224-9232.

"Quantitative Collision Cross Sections from FTICR Linewidth Measurements: Improvements in Theory and Experiment." Anupriya, E. Gustafson, D. N. Mortensen, D. V. Dearden. *J. Am. Soc. Mass Spectrom.*, **2018**, 29, 251-259.

"Collisional Cross-Sections with T-Wave Ion Mobility Spectrometry without Experimental Calibration." D. N. Mortensen, A. C. Susa, E. R. Williams. *J. Am. Soc. Mass Spectrom.*, **2017**, 28, 1282-1292.

"Microsecond and Nanosecond Polyproline II Helix Formation in Charged Nanodrops Monitored by Mass Spectrometry." D. N. Mortensen, E. R. Williams. *Chem. Commun.*, **2016**, 52, 12218-12221.

"Surface-Induced Protein Unfolding in Submicron Electrospray Emitters." D. N. Mortensen, E. R. Williams. *Anal. Chem.*, **2016**, 88, 9662−9668.

"Electrothermal Supercharging of Proteins in Native MS: Effects of Protein Isoelectric Point, Buffer, and nanoESI-Emitter Tip Size." D. N. Mortensen, E. R. Williams. *Analyst*, **2016**, 141, 5598–5606.

"Ultrafast (1 μs) Mixing and Fast Protein Folding in Nanodrops Monitored by Mass Spectrometry." D. N. Mortensen, E. R. Williams. *J. Am. Chem. Soc.*, **2016**, 138, 3453–3460.

"Investigating Protein Folding and Unfolding in Electrospray Nanodrops Upon Rapid Mixing Using Theta-Glass Emitters." D. N. Mortensen, E. R. Williams. *Anal. Chem.*, **2015**, 87, 1281−1287.

"Theta-Glass Capillaries in Electrospray Ionization: Rapid Mixing and Short Droplet Lifetimes." D. N. Mortensen, E. R. Williams. *Anal. Chem.*, **2014**, 86, 9315−9321.

"Effects of Cations on Protein and Peptide Charging in Electrospray Ionization from Aqueous Solutions." A. C. Susa, D. N. Mortensen, E. R. Williams. *J. Am. Soc. Mass Spectrom.*, **2014**, 25, 918-927.

"Appropriate choice of event length in sustained off-resonance irradiation collision-induced dissociation (SORI-CID) experiments: Activated ion collision-induced dissociation." D. N. Mortensen, C. A. Jones, D. V. Dearden. *I. J. Mass Spec.*, **2012**, 330–332, 241–245.

"Influence of charge repulsion on binding strengths: experimental and computational characterization of mixed alkali metal complexes of decamethylcucurbit[5]uril in the gas phase." D. N. Mortensen, D. V. Dearden. *Chem. Commun.*, **2011**, 47, 6081–6083.

Professional Presentations

"Using Theta-Glass Capillaries to Carry Out Chemical Reactions during Electrospray Ionization." D. N. Mortensen, E. R. Williams. Poster presented at the Gordon Research Conference on Gaseous Ions: Structures, Energetics & Reactions, Galveston, TX, Feb. 22-27, **2015**.

"Cucurbituril Characterization Using Advanced Mass Spectrometry Techniques." D.V. Dearden, C.A. Jones, Anupriya, F. Yang, D.N. Mortensen. Invited talk presented at the 3rd International Conference on Cucurbiturils; Canberra, Australia; Nov. 17—20, **2013**.

"Proteins from ESI: What Controls Charge States?" D. N. Mortensen, A. C. Susa, E. R. Williams. Talk presented at the Lake Arrowhead Conference on Ion Chemistry and Mass Spectrometry, Jan. 18-20, **2013**.

"The Role of Charge Repulsion in the Stability of Supramolecular Complexes: a Gas Phase Experimental and Computational Study." D.N. Mortensen, D.V. Dearden. Poster presented at the 6th International Symposium on Macrocyclic and Supramolecular Chemistry; Brighton, United Kingdom; July 3-7, **2011**.

"Binding of Metal Ions and Amines by Cucurbiturils in the Gas Phase." D.V. Dearden, F. Yang, D.N. Mortensen, K. Kim, N. Selvapalam, Y. Kim. Invited talk presented at the 2nd International Conference on Cucurbiturils; Cambridge, United Kingdom; June 29—July 2, **2011**.

"Stabilizing Complexes of Decamethylcucurbit[5]uril With Alkali Metals via Xe Trapping." D. N. Mortensen, C. A. Jones, D. V. Dearden. Talk presented at the 59th ASMS Conference on Mass Spectrometry and Allied Topics, Denver, CO, June 5-9, **2011**.

"Xenon Trapping: A Novel Method for Stabilizing Host Guest Complexes of Decamethylcucurbit[5]uril With Alkali Metals." D. N. Mortensen, D. V. Dearden. Poster presented at the 59th ASMS Conference on Mass Spectrometry and Allied Topics, Denver, CO, June 5-9, **2011**.

"Influence of Excitation Sweep Direction on the Detection of Non-covalent Complex Ions Using FTICR-MS." C.A. Jones, D.M. Mortensen, D.V. Dearden. Talk presented at the 59th ASMS Conference on Mass Spectrometry and Allied Topics; Denver, CO; June 5-9, **2011**.

"Influence of charge repulsion on binding in mixed alkali metal complexes of decamethylcucurbit[5]uril." D. N. Mortensen, D. V. Dearden. Poster presented at the 241st American Chemical Society National Meeting & Exposition, Anaheim, CA, March 27-31, **2011**.

"Influence of charge repulsion on binding strengths: experimental and computational characterization of mixed alkali metal complexes of decamethylcucurbit[5]uril." D. N. Mortensen, D. V. Dearden. Talk presented at the Student Research Conference, Brigham Young University, Provo, UT, March 19, **2011**.

"Multiple Binding Sites: a Gas Phase Study." D.N. Mortensen, D.V. Dearden. Poster presented at the Gordon Research Conference on Gaseous Ions; Galveston, TX; February 27—March 4, **2011**.

"Complexation of α,ω-alkyldiammonium with Cucurbit[7]uril in the Gas Phase: Dependence of Bond Strength on Alkyl Chain Length." D. N. Mortensen, D. V. Dearden. Poster presented at the 58th ASMS Conference on Mass Spectrometry and Allied Topics, Salt Lake City, UT, May 23—27, **2010**.

Professional Societies

American Society for Mass Spectrometry (2009—2021)
United States Human Proteome Organization (2017—2021)
Association of Biomolecular Resource Facilities (2019—2021)
American Chemical Society (2020—2021)

Manuscript Reviews

I have reviewed 4 journal articles for *Analyst* (Impact factor: 3.864)
I have reviewed 2 articles for the *International Journal of Mass Spectrometry* (Impact factor: 1.702)

Honors and Awards

Richard A. Schaeffer Memorial Fund Travel Award, 2015
UC Berkeley Graduate Division Conference Travel Grant, 2015
Scott C. & Joanne H. Pugh Scholarship, Brigham Young University, 2009—2011
Undergraduate Research Award, Brigham Young University, 2009—2011
Brigham Young Scholarship, Brigham Young University, 2008—2011
Chemistry Student of the Year, Eastern Arizona College, 2006

Instrument Experience

Major instruments I manage, maintain, and repair in BYU's Biological Mass Spectrometry and Cell Sorting Core Facilities:

- 6530 Accurate-Mass Q-TOF LC/MS equipped with a 1290 Infinity II HPLC system (Agilent Technologies)
- Orbitrap Fusion Lumos Tribrid Mass Spectrometer equipped with an Easy-nLC 1200 nano-LC system (Thermo Scientific)
- Orbitrap Fusion Lumos Tribrid Mass Spectrometer equipped with a Dionex UltiMate 3000 RSLC-nano System (Thermo Scientific)
- LTQ XL Linear Ion Trap Mass Spectrometer equipped with a Dionex UltiMate 3000 RSLC-nano System (Thermo Scientific)
- micrOTOF II High performance TOF-MS system (Bruker Daltonics) equipped with a homebuilt DESI-imaging system

- Exactive Orbitrap Mass Spectrometer (Thermo Scientific)
- FACS Aria Fusion flow cytometer (BD Biosciences)

Major instrument I managed, maintained, and repaired during BYU Postdoc:

- APEX 47e FTICR mass spectrometer (Bruker)

Major instruments used during graduate school at UC Berkeley:

- 9.4 T FTICR mass spectrometer built in conjunction with Bruker Daltonics. I was responsible for maintaining and repairing this instrument.
- Q-TOF Premier hybrid mass spectrometer (Waters)
- Synapt G2 High Definition mass spectrometer (Waters)

Major instrument I used during BYU undergrad:

- APEX 47e FTICR mass spectrometer (Bruker)