Daniel Graham Delafield

645 Skyview Place, Madison, WI 53713 | 405-219-4741 | graham.delafield@gmail.com | www.grahamdelafield.com

Education

DOTCOR OF PHILOSOPHY | (MAY 2023) | UNIVERSITY OF WISCONSIN-MADISON
- Primary Field: Chemistry
- Division: Analytical Chemistry
- GPA: 4.0

MASTER OF SCIENCE | MAY 2018 | UNIVERSITY OF OKLAHOMA
- Primary Field: Chemistry
- Division: Analytical Chemistry
- GPA: 3.9

BACHELOR OF SCIENCE | MAY 2016 | UNIVERSITY OF OKLAHOMA
- Major: Biochemistry
- Minor: Music
- Honors: Cum Laude

Employment and Internships

- June 2021 – August 2021: Summer Research Intern, Genentech
    - Developed custom, full-stack desktop applications to automate and streamline immunogenicity assessment of drug candidates, which enabled > 99% reduction in analysis time.
    - Engineered custom user interfaces to enable high-throughput analysis of large tabular datasets, providing a 500-fold increase in data utilization.
- 2019-Present: **Ambassador**, Wisconsin Alumni Research Foundation
    - Successfully identified, summarized, and advertised gene edited cell lines in order to move them from invention to commercial license.
    - Utilized custom web scraping, literature term finding, and personal networking to identify potential technologies suitable for patent and licensing.
    - Responsible for establishing, maintaining, and utilizing network of academic and industrial researchers and disseminating procedural knowledge for technology transfer.

Funding

- Acquisition of a Dual-Source, High-Performance, Ion Mobility, Quadrupole Time-of-Flight Mass Spectrometry System for Biomedical Research at UW-Madison (**1S10OD028473-01A1**)
    - Role: Primary Author
    - Funding Amount: $1,275,704

Publications

- **D.G. Delafield**, Li, L., (2020) “Chemical Tags and Associated Strategies for Quantitative Glycoproteomics.” *Molecular & Cellular Proteomics*. Published online June 23, 2020. 10.1074/mcp.R120.002095.
- **D.G. Delafield**, H.N. Miles, Y. Liu, W.A. Ricke, L. Li, (2020). “Complementary Proteome and Glycoproteome Access Revealed Through Comparative Analysis of Reversed Phase and Porous Graphitic Carbon Chromatography.” (In submission)

- H.N. Miles†, **D.G. Delafield**†, L. Li, (2020). "Recent Developments and Applications of Quantitative Proteomics Strategies for High-Throughput Cancer Biomolecular Analyses in Cancer Research. *RSC Chemical Biology*. Published online May 15, 2021. 10.1039/D1CB00039J.
- Y. Liu, **D.G. Delafield**, L. Li (2020) "Comprehensive Mass Spectrometric Characterization of Neuropeptidome in Nervous System of the Atlantic Blue Crab, *Callinectes sapidus*," *Analytical Chemistry*, to be submitted.
- Y Shi, Z. Li, **D.G. Delafield**, Z. Ye, H. Ye, X. Shi, B. Wang, Z. Chen, F. Ma, L. Li (2020) A Novel Mass Spectrometry-based Method for Qualitative and Quantitative Analysis of Citrullinated Proteins from Complex Biological Samples. *Nature Methods,* in submission.
- X. Zhong, D. C. Frost, Q. Yu, M. Li, T.-J. Gu, **D.G. Delafield**, L. Li (2020) "Mass Defect-based DiLeu Tagging for Multiplexed Data-Independent Acquisition," *Analytical Chemistry*, to be submitted.
- Z. Li, D. M. Tremmel, F. Ma, Q. Yu, M. Ma, **D.G. Delafield**, Y. Shi, B. Wang, S. A. Mitchell, A. K. Feeney, V. S. Jain, S. D. Sackett, J. S. Odorico, L. Li (2020) "Proteome-wide and Matrisome-specific Alterations during Human Pancreas Development and Maturation," Nature Communications. Published online Februrary 15, 2021. 10.1038/s41467-021-21261-w.
- Ruiz, M., Y. Yang, C. A. Lochbaum, **D. G. Delafield**, J. J. Pignatello, L. Li and J. A. Pedersen (2019). "Peroxymonosulfate Oxidizes Amino Acids in Water without Activation." *Environmental Science and Technology*. *53*, 10845-10854.
- Li, G., **D.G. Delafield** and L. Li (2019). "Improved Structural Elucidation of Peptide Isomers and Their Receptors Using Advanced Ion Mobility-Mass Spectrometry." *Trends in Analytical Chemistry*. Published online, June 4, 2019, in press, https://doi.org/10.1016/j.trac.2019.05.048
- Ma, H., **D. G. Delafield**, Z. Wang, J. You and S. Wu (2017). "Finding Biomass Degrading Enzymes Through an Activity-Correlated Quantitative Proteomics Platform (ACPP)." *Journal of American Society for Mass Spectrometry*. *28,* 655-663.

Presentations

- Delafield, D.G.; Cui, Y.; Li, L. "Uncovering Glycoprotein Structural and Compositional Heterogeneity Through Capillary Electrophoresis-Ion Mobility Mass Spectrometry" ACS Fall Meeting 2021 (**oral**)
- Delafield, D.G.; Li, L. "Enhancing Glycopeptide Detection, Identification, and Structural Characterization through PGC-Incorporated LC-MS" Pittcon 2021 (**oral**).
- **Delafield, D.G.**; Li, L. "Enhancing Glycopeptide Detection, Identification, and Structural Characterization through PGC-Incorporated LC-IMS" ASMS 2020 (poster).
- **Delafield, D.G.**; Li, G.; Li, L. "Pursuit of Bottom-Up, Middle-Down, and Top-Down Glycoconjugate Analysis Enabled Through Online CE-ESI-IMS" ASMS 2019 (poster).
- **Delafield, D.G.**; Wang, Z.; Baird, M.A.; Shvartsburg, A.; Wu, S. "Characterization Analysis of Glycopeptides Through Arrival Time Correlation using Concurrent RPLC Fraction Monitoring and FAIMS Filtering" ASMS 2018 (poster).
- **Delafield, D.G.,** N-Glycopeptide Feature Identification by Revealing Trends Between Analyte Composition and Compensation Field Through FAIMS-Coupled MS Platform" US HUPO 2018 (**oral**).
- **Delafield, D.G.**; Wang, Z.; Baird, M.A.; Shvartsburg, A.; Smith, K.; Wu, S. "Three-Dimensional Platform for N-Linked Glycopeptide Separation and Analysis" ASMS 2017 (poster).
- **Delafield, D.G.**; Wang, Z.; Woodard, T. Wu, S. "Magnetic Resin Microreactor for Affinity-Capture Top-Down Mass Spectrometry" ASMS 2016 (poster).

Awards and Honors

- **2019**: Student Research Travel Grant
  - Application-based.
- **2018**: Honored Instructor Award
  - Student nomination based. Awarded in recognition of challenging, helpful and inspirational teaching.
- **2018**: ASMS Travel Grant
  - Application-based.

- **2017**: Head Teaching Assistant
  - Merit-based. Awarded for significant display of teaching aptitude, leadership, and organization.
- **2017**: Certificate of Distinction in Teaching
  - Evaluation-based. Awarded to the top 10% of all Graduate Teaching Assistants at the University.
- **2017**: College of Arts & Sciences Travel Grant
  - Application-based.
- **2016**: Scott Laing Outstanding Undergraduate Research Award
  - Nomination/Committee-based. Awarded for significant accomplishments as an undergraduate researcher.
- **2016**: Honors Research Assistant
  - Application-based appointment. Awarded in recognition of significant contribution to ongoing and future research.
- **2016**: Outstanding Senior Man Award
  - Peer vote based. Awarded in recognition of superior contribution, peer relationships, and valuable talent.
- **2016**: J. Lee Burke Outstanding Student Achievement Award
  - Nomination/Committee-based. Awarded for outstanding service, achievement and organizational success.

Research Experience

UNIVERSITY OF WISCONSIN-MADISON, LI LAB

- **Graduate Research/Teaching Assistant**, August 2018 – Present
  - Development of novel online multiplexed analysis of bottom-up, middle-down, and top-down glycoconjugate species utilizing capillary electrophoresis, porous graphitized carbon liquid chromatography, ion mobility spectrometry, and mass spectrometry.

UNIVERSITY OF OKLAHOMA, WU LAB

- **Graduate Research/Teaching Assistant**, May 2016 – August 2018
  - Developed a three-dimensional method of glycopeptide purification and characterization allowing universal application, unbiased separation, and rapid recognition through the use of HPLC, concurrent fractionation, Mass Spectrometry, and Differential Ion Mobility (FAIMS). Presented at ASMS, June 2017.
  - Demonstrated correlation between differential ion mobility detection and glycopeptide analytes based on backbone variation, glycan composition, and a combination thereof.
  - Analyzed post translationally modified glycoproteins of control and SLE patient serum immunoglobulin searching for correlations to immune response and glycan features based on our previous glycopeptide purification platform.
- **Honors Research Assistant**, January 2016 – May 2016
  - Conceptualized, designed, and constructed an online affinity capture technique for immunoprecipitation application involving intensive immunoglobulin purification, original apparatus design, and top-down mass spectrometry. ASMS, June 2016.
- **Undergraduate Research Assistant**, August 2015 – January 2016
  - Determined activity of novel biomass degrading enzymes from Great Lakes fungal samples through culturing, secretome extraction, enzymatic assays, concentration determination, electrophoresis, liquid chromatography and mass spectrometry. Published in JASMS, April 2017 (Online January 2017).

Teaching Experience and Community Involvement

- **Teaching Assistant**, August 2018-May 2019
  - Formulated and delivered bi-weekly lesson plans based on outlined course objectives
  - Assisted in exam writing and proofing

- Aided student groups in the development of unique experiment design and result presentation

- **Head Teaching Assistant**, August 2017-May 2018
  - Coordinated teaching schedules, materials, and lesson plans for 57 Teaching Assistants across 71 classes
  - Served as primary contact between professors of record and 2,000+ undergraduate students
  - Led teaching assistants through development of weekly instruction, grading expectations, and lesson preparation
  - Reviewed and rewrote exam material based on learning objectives

- **Teaching Assistant**, August 2016-May 2017
  - Designed interactive lessons based on course learning objectives
  - Promoted individual and group demonstration of knowledge
  - Created, submitted, explained, and graded weekly assignments

- **Norman North High School**, 2015-2017
  - Formulated and implemented lesson plans for groups small and large
  - Assisted team members in goal-based teaching strategies
  - Adapted learning concepts to promote growth and retention

Professional Affiliations

- **American Society for Mass Spectrometry**
- **United States Human Proteome Organization (U.S. HUPO)**