

Gabe Nagy

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Education and Positions

- | | |
|--|------------------------|
| University of Utah
Assistant Professor of Chemistry
July 2020 – Present | Salt Lake City, UT USA |
| Pacific Northwest National Laboratory
Postdoctoral Research Associate, Richard D. Smith Group
August 2017 – June 2020 | Richland, WA USA |
| Indiana University, Ph.D.
Analytical Chemistry, Nicola L. B. Pohl Group
August 2012 – July 2017 | Bloomington, IN USA |
| Creighton University, B.S.
Major in Chemistry with Minor in Mathematics
August 2008 – May 2012 | Omaha, NE USA |

Publications

University of Utah (independent research):

33) Williamson, D. L.; Bergman, A. E.; Nagy, G. "Investigating the Structure of α/β Carbohydrate Linkage Isomers as a Function of Group I Metal Adduction and Degree of Polymerization as Revealed by Cyclic Ion Mobility Separations." *Journal of the American Society for Mass Spectrometry*, 2021, DOI: 10.1021/jasms.1c00207.

32) Peterson, T. L.; Nagy, G. "Toward Sequencing the Human Milk Glycome: High-Resolution Cyclic Ion Mobility Separations of Core Human Milk Oligosaccharide Building Blocks." *Analytical Chemistry*, 2021, 93, 9397–9407.

Graduate and post-doctoral (mentored research):

31) Harrilal, C. P.; Gandhi, V. D.; Nagy, G.; Chen, X.; Buchanan, M. G.; Wojcik, R.; Conant, C. R.; Donor, M. T.; Ibrahim, Y. M.; Garimella, S. V. B.; Smith, R. D.; Larriba-Andaluz, C. "Measurement and Theory of Gas Phase Ion Mobility Shifts Resulting from Isotopomer Mass Distribution Changes." *Submitted to: Analytical Chemistry*, 2021.

30) Hollerbach, A. L.; Conant, C. R.; Nagy, G.; Monroe, M. E.; Gupta, K.; Donor, M.; Giberson, C. M.; Garimella, S. V. B.; Smith, R. D.; Ibrahim, Y. M. "Dynamic Time-Warping Correction for Shifts in Ultrahigh Resolving Power Ion Mobility Spectrometry and Structures for Lossless Ion Manipulations." *Journal of the American Society for Mass Spectrometry*, 2021, 32, 996–1007.

29) Conant, C. R.; Attah, I. K.; Garimella, S. V. B.; Nagy, G.; Bilbao, A.; Smith, R. D.; Ibrahim, Y. M. "Evaluation of Waveform Profiles for Traveling Wave Ion Mobility Separations in Structures for Lossless Ion Manipulations." *Journal of the American Society for Mass Spectrometry*, 2020, 32, 225–236.

28) Li, A.; Conant, C. R.; Zheng, X.; Bloodsworth, K. J.; Orton, D. J.; Garimella, S. V. B.; Attah, I. K.; Nagy, G.; Smith, R. D.; Ibrahim, Y. M. "Assessing Collision Cross Section Calibration Strategies for Traveling Wave-Based Ion Mobility Separations in Structures for Lossless Ion Manipulations." *Analytical Chemistry*, 2020, 92, 14976–14982.

27) Li, A.; Nagy, G.; Conant, C. R.; Norheim, R. V.; Yong Lee, J.; Giberson, C.; Hollerbach, A. L.; Prabhakaran, V.; Attah, I. K.; Chouinard, C. D.; Prabhakaran, A.; Smith, R. D.; Ibrahim, Y. M.; Garimella, S. V. B. "Ion Mobility Spectrometry with High Ion Utilization Efficiency Using Traveling Wave-Based Structures for Lossless Ion Manipulations." *Analytical Chemistry*, 2020, 92, 14930–14928.

26) Hollerbach, A. L.; Li, A.; Prabhakaran, A.; Nagy, G.; Harrilal, C. P.; Conant, C. R.; Norheim, R. V.; Schimelfenig, C. E.; Anderson, G. A.; Garimella, S. V. B.; Smith, R. D.; Ibrahim, Y. M. "Ultra-High Resolution Ion Mobility Separations Over Extended Path Lengths and Mobility Ranges Achieved using a Multilevel Structures for Lossless Ion Manipulations (SLIM) Module." *Analytical Chemistry*, 2020, 92, 7972–7979.

25) Nagy, G.; Attah, I. K.; Conant, C. R.; Liu, W.; Garimella, S. V. B.; Gunawardena, H. P.; Shaw, J. B.; Smith, R. D.; Ibrahim, Y. M. "Rapid and Simultaneous Characterization of Drug Conjugation in Heavy and Light Chains of a Monoclonal Antibody Revealed by High-Resolution Ion Mobility Separations in SLIM." *Analytical Chemistry*, 2020, 92, 5004–5012.

24) *Wojcik, R.; *Nagy, G.; Attah, I. K.; Webb, I. K.; Garimella, S. V. B.; Weitz, K. K.; Hollerbach, A.; Monroe, M. E.; Ligare, M. R.; Nielson, F. F.; Norheim, R. V.; Renslow, R. S.; Metz, T. O.; Ibrahim, Y. M.; Smith, R. D. "SLIM Ultrahigh Resolution Ion Mobility Spectrometry Separations of Isotopologues and Isotopomers Reveal Mobility Shifts due to Mass Distribution Changes." *Analytical Chemistry*, 2019, 91, 11952–11962. (* Co-first author).

23) Attah, I. K.; Nagy, G.; Garimella, S. V. B.; Norheim, R. V.; Anderson, G. A.; Ibrahim, Y. M.; Smith, R. D. "Traveling wave-based electrodynamic switch for concurrent dual polarity ion manipulations in Structures for Lossless Ion Manipulations." *Analytical Chemistry*, 2019, 91, 14712–14718.

22) *Garimella, S. V. B.; *Nagy, G.; Ibrahim, Y. I.; Smith, R. D. "Opening New Paths for Biological Applications of Ion Mobility-Mass Spectrometry using Structures for Lossless Ion Manipulations." *Trends in Analytical Chemistry*, 2019, 116, 300–307. (*Co-first author).

21) Nagy, G.; Kedia, K.; Attah, I. K.; Garimella, S. V. B.; Ibrahim, Y. M.; Petyuk, V. A.; Smith, R. D. "Separation of β -Amyloid Tryptic Peptide Species with Isomerized and Racemized L-Aspartic Residues with Ion Mobility in Structures for Lossless Ion Manipulations." *Analytical Chemistry*, 2019, 91, 4374–4380.

20) *Nagy, G.; *Veličković, D.; Chu, R. K.; Carrell, A. A.; Weston, D. J.; Ibrahim, Y. M.; Anderton, C. R.; Smith, R. D. "Towards Resolving the Spatial Metabolome with Unambiguous Molecular Annotations in Complex Biological Systems by Coupling Mass Spectrometry Imaging with Structures for Lossless Ion Manipulations." *Chemical Communications*, 2019, 55, 306–309. (* Co-first author).

19) Attah, I. K.; Garimella, S. V. B.; Webb, I. K.; Nagy, G.; Norheim, R. V.; Schimelfenig, C. E.; Ibrahim, Y. M.; Smith, R. D. "Dual Polarity Ion Confinement and Mobility Separations." *Journal of the American Society for Mass Spectrometry*, 2019, 30, 967–976.

18) Wooke, Z.; Nagy, G.; Barnes, L. F.; Pohl, N. L. B. "Development of a Post-Column Liquid Chromatographic Chiral Addition Method for the Separation and Resolution of Common Mammalian Monosaccharides." *Journal of the American Society for Mass Spectrometry*, 2019, 30, 419–425.

- 17) Chouinard, C. D.; Nagy, G.; Smith, R. D.; Baker, E. S. "Ion Mobility-Mass Spectrometry in Metabolomic, Lipidomic, and Proteomic Analyses." in *Comprehensive Analytical Chemistry: Advances in Ion Mobility-Mass Spectrometry: Fundamentals, Instrumentation and Applications*, ed. Barcelo, D., 2019, Vol. 83, pp. 123–159.
- 16) Couvillion, S. P.; Zhu, Y.; Nagy, G.; Adkins, J. A.; Ansong, C.; Renslow, R. S.; Piehowski, P. D.; Ibrahim, Y. M.; Kelly, R. T.; Metz, T. O. "New Mass Spectrometry Technologies Contributing Towards Comprehensive and High Throughput Omics Analyses of Single Cells." *Analyst*, 2019, *144*, 794–807.
- 15) Garcellano, R. C.; Moinuddin, S. G. A.; Young, R. P.; Zhou, M.; Bowder, M. E.; Renslow, R. S.; Yesiltepe, Y.; Thomas, D. G.; Colby, S. M.; Chouinard, C. D.; Nagy, G.; Attah, I. K.; Ibrahim, Y. M.; Ma, R.; Franzblau, S. G.; Lewis, N. G.; Aguinaldo, A. M.; Cort, J. R. "Isolation of Tryptanthrin and Reassessment of Evidence for Its Isobaric Isotere Wrightiadione in Plants of the *Wrightia* Genus." *Journal of Natural Products*, 2019, *82*, 440–448.
- 14) Dou, M.; Chouinard, C. D.; Zhu, Y.; Nagy, G.; Liyu, A. V.; Ibrahim, Y. M.; Smith, R. D.; Kelly, R. T. "Nanowell-Mediated Multidimensional Separations Combining NanoLC with SLIM IM-MS for Rapid, High-Peak Capacity Proteomic Analyses." *Analytical and Bioanalytical Chemistry*, 2019, *411*, 5363–5372.
- 13) Nagy, G.; Attah, I. K.; Garimella, S. V. B.; Tang, K.; Ibrahim, Y. M.; Baker, E. S.; Smith, R. D. "Unraveling the Isomeric Heterogeneity of Glycans: Ion Mobility Separations in Structures for Lossless Ion Manipulations." *Chemical Communications*, 2018, *54*, 11701–11704.
- 12) Nagy, G.; Chouinard, C. D.; Attah, I. K.; Webb, I. K.; Garimella, S. V. B.; Ibrahim, Y. M.; Baker, E. S.; Smith, R. D. "Distinguishing Enantiomeric Amino Acids with Chiral Cyclodextrin Adducts and Structures for Lossless Ion Manipulations." *Electrophoresis*, 2018, *39*, 3148–3155.
- 11) *Chouinard, C. D.; *Nagy, G.; Webb, I. K.; Garimella, S. V. B.; Baker, E. S.; Ibrahim, Y. M.; Smith, R. D. "Rapid Ion Mobility Separations of Bile Acid Isomers using Cyclodextrin Adducts and Structures for Lossless Ion Manipulations." *Analytical Chemistry*, 2018, *90* 11086–11091. (* Co-first author).
- 10) *Chouinard, C. D.; *Nagy, G.; Webb, I. K.; Shi, T.; Baker, E. S.; Prost, S. A.; Liu, T.; Ibrahim, Y. M.; Smith, R. D. "Improved Sensitivity and Separations for Phosphopeptides using Online LC Coupled with Structures for Lossless (SLIM) IM-MS." *Analytical Chemistry*, 2018, *90*, 10889–10896. (* Co-first author).
- 9) *Nagy, G.; *Peng, T.; Pohl, N. L. B. "Recent Liquid Chromatographic Approaches and Developments for the Separation and Purification of Carbohydrates." *Analytical Methods*, 2017, *9*, 3579–3593. (*Co-first author).
- 8) Gaunitz, S.; Nagy, G.; Pohl, N. L. B.; Novotny, M. V. "Recent Advances in the Analysis of Complex Glycoproteins." *Analytical Chemistry*, 2017, *89*, 389–413.
- 7) Peng, T.; Nagy, G.; Trinidad, J. C.; Jackson, J. M.; Pohl, N. L. B. "A High-Throughput Mass-Spectrometry-Based Assay for Identifying the Biochemical Functions of Putative Glycosidases." *ChemBioChem*, 2017, *18*, 2306–2311.
- 6) Schenk, J.; Nagy, G.; Pohl, N. L. B.; Leghissa, A.; Smuts, J.; Schug, K. A.

"Identification and Deconvolution of Carbohydrates using Gas Chromatography-Vacuum Ultraviolet Spectroscopy." *Journal of Chromatography A*, 2017, 1513, 210–221.

5) *Nagy, G.; *Peng, T.; Kabotso, D. E. K.; Novotny, M. V.; Pohl, N. L. B. "Protocol for the Purification of Protected Carbohydrates: Toward Coupling Automated Synthesis to Alternate-Pump Recycling High-Performance Liquid Chromatography." *Chemical Communications*, 2016, 52, 13253–13256. (* Co-first author).

4) *Nagy, G.; *Peng, T.; Pohl, N. L. B. "General Label-Free Mass Spectrometry-Based Assay to Identify Glycosidase Substrate Competence." *Analytical Chemistry*, 2016, 88, 7183–7190. (* Co-first author).

3) Gaye, M. M.; Nagy, G.; Clemmer, D. E.; Pohl, N. L. B. "Multidimensional Analysis of 16 Glucose Isomers by Ion Mobility Spectrometry." *Analytical Chemistry*, 2016, 88, 2335–2344.

2) Nagy, G.; Pohl, N. L. B. "Monosaccharide Identification as a First Step Toward *de novo* Carbohydrate Sequencing: Mass Spectrometry Strategy for the Identification and Differentiation of Diastereomeric and Enantiomeric Pentose Isomers." *Analytical Chemistry*, 2015, 87, 4566–4571.

1) Nagy, G.; Pohl, N. L. B. "Complete Hexose Identification with Mass Spectrometry." *Journal of the American Society for Mass Spectrometry*, 2015, 26, 677–685.

Oral Presentations University of Utah (independent research):

11) "Characterization of Human Milk Oligosaccharide Building Block Isomers with Cyclic Ion Mobility Separations and Mass Spectrometry." Invited seminar presented at Brigham Young University, Provo, UT, 23 September 2021.

10) Indiana University Career Development Symposium (Virtual), Invited seminar, 13 September 2021

9) "Towards *de novo* sequencing of the human milk glycome: High-resolution cyclic ion mobility separations." Rocky Mountain Regional American Chemical Society Meeting (Virtual), 12 November 2020.

Graduate and post-doctoral (mentored research):

8) "When Conventional Approaches Fall Short: Developing Analytical Strategies for Resolving Isomeric Biomolecules." Faculty interview at Notre Dame University, South Bend, IN, 27 January 2020.

7) "When Conventional Approaches Fall Short: Developing Analytical Strategies for Resolving Isomeric Biomolecules." Faculty interview at the University of Vermont, Burlington, VT, 12 December 2019.

6) "When Conventional Approaches Fall Short: Developing Analytical Strategies for Resolving Isomeric Biomolecules." Faculty interview at the University of Utah, Salt Lake City, UT, 13 November 2019.

5) "Developing New Approaches for the Better Characterization of Isomeric Peptides: Ion Mobility Separations Enabled by Structures for Lossless Ion Manipulations." Invited seminar presented at SciX Conference, Palm Springs, CA, 15 October 2019.

- 4) "Development of Analytical Techniques for Unraveling the Isomeric Heterogeneity of Glycans." Invited seminar presented at Creighton University, Omaha, NE, 20 September 2018.
- 3) "High-Resolution SLIM IM-MS-Based Enantioseparations." 2018 Post-Graduate Symposium, Pacific Northwest National Laboratory, Richland, WA, 21 June 2018.
- 2) "High-Resolution Enantiomeric Separations on a SLIM-IM MS Platform." 66th American Society for Mass Spectrometry Conference, San Diego, CA, 5 June 2018.
- 1) "Toward Carbohydrate Sequencing: Mass Spectrometry and Ion Mobility-Mass Spectrometry-Based Approaches." Quantitative & Chemical Biology Graduate Training Program Evenings, Indiana University, 2 November 2016.

Poster Presentations

- 11) "Rapid Characterization of Drug Conjugation in a Monoclonal Antibody by High-Resolution Ion Mobility Separations in Structures for Lossless Ion Manipulations." 68th American Society for Mass Spectrometry Conference (Virtual, Summer 2020).
- 10) "Addressing Challenging Biological Applications with Ultrahigh Resolution Ion Mobility Separations in Structures for Lossless Ion Manipulations." Waters Corporation's Young Investigator's Summit, Beverly, MA, 6 August 2019.
- 9) "Resolving the Isomeric Heterogeneity of the Glycome: Ultrahigh-Resolution Ion Mobility Separations in Structures for Lossless Ion Manipulations." 67th American Society for Mass Spectrometry Conference, Atlanta, GA, 5 June 2019.
- 8) "From Computation to Mass Spectrometry: Relative Free Energy Differences amongst Anomeric Pairs of Carbohydrate Derivatives." 65th American Society for Mass Spectrometry Conference, Indianapolis, IN, 6 June 2017.
- 7) Methodology towards the Purification and Analysis of Glycopolymers." American Society for Biochemistry and Molecular Biology, Chicago, IL, 24 April 2017.
- 6) "Purification of Synthetic Protected Carbohydrates: An Alternate-Pump Recycling High-Performance Liquid Chromatography-Based Approach." Turkey Run Analytical Conference, Marshall, IN, 28 October 2016.
- 5) "Mass Spectrometry-Based Glycosidase Assay: A General Label-Free Chiral Dopant Approach." Turkey Run Analytical Conference, Marshall, IN, 2 October 2015.
- 4) "Towards *de novo* Oligosaccharide Sequencing." 63rd American Society for Mass Spectrometry Conference, St. Louis, MO, 3 June 2015.
- 3) "Mass Spectrometry-Based Methodology for Complete Hexose Identification." Turkey Run Analytical Conference, Marshall, IN, 14 November 2014.
- 2) "Use of Mass Spectrometry for Chiral Separation of Monosaccharides." Turkey Run Analytical Conference, Marshall, IN, 27 September 2013.
- 1) "Study of Carbohydrate-Protein Interactions using New Cross-Linking Agents and Target Identification through Mass Spectrometry." 246th American Chemical Society Conference, Indianapolis, IN, 8 September 2013.

Funding

Pacific Northwest National Laboratory, Quickstarter 2019

Project: "Integration of Ultraviolet Photodissociation and High-Resolution Ion Mobility Separations in Structures for Lossless Ion Manipulations"

Award Period: 1 October 2019 – 30 September 2020

Total Award Amount: \$5000

Team Members: Gabe Nagy, Jared B. Shaw

Role: Principal Investigator

Pacific Northwest National Laboratory, Quickstarter 2018

Project: "Implementation of Chiral Drift Gases in SLIM: Toward a Universal Approach for High-Resolution Enantiomeric Separations"

Award Period: 1 October 2018 – 1 October 2019

Total Award Amount: \$8000

Team Members: Gabe Nagy, Isaac K. Attah, Karl K. Weitz

Role: Principal Investigator

Awards

Pacific Northwest National Laboratory, Postdoctoral Recognition Award, 2019.

Indiana University, Department of Chemistry, Marvin Carmack Fellowship, Fall 2016.

Indiana University, Department of Chemistry, Associate Instructor Teaching Award, 2014.

Teaching

CHEM 7590: Advanced Topics in Analytical Chemistry (Mass Spectrometry)
Fall B term (October 2020 – December 2020).

CHEM 5350/7350: Research Ethics
Spring A term (January 2021 – March 2021).

Service

University of Utah:

Department of Chemistry Seminar and Colloquium Committee (2020–2021).

Role: member

Department of Chemistry, Graduate Admissions Committee (2020-2021).

Role: member

Professional and Community:

Females in Mass Spectrometry (FeMS), a community-led initiative to create a network of support for women in the field of mass spectrometry (2020–2021).

Role: mentor

Journal reviewer for: Analytical Chemistry, Journal of the American Society for Mass Spectrometry, Journal of Separation Science, ACS Infectious Diseases, Electrophoresis

Lab Personnel

URL: <https://www.nagylab.com>

Current group members: David Williamson (graduate student), Tyler Peterson (graduate student), Addison Bergman (summer REU student)

Affiliations

American Society for Mass Spectrometry

