

**Kelly M. Hines, Ph.D.**  
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Department of Chemistry  
University of Georgia  
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## Research Interests

Bioanalytical Chemistry, Lipidomics, Metabolomics, Ion Mobility, Mass Spectrometry, Microorganisms, Lipid Biosynthesis, Antibiotic Resistance

## Professional Experience

<b>University of Georgia</b> Assistant Professor, Department of Chemistry	Athens, GA 08/2019 – Present
<b>University of Washington School of Pharmacy</b> Senior Fellow, Department of Medicinal Chemistry, (Advisor: Dr. Libin Xu)	Seattle, WA 07/2015 – 07/2019
<b>Mayo Clinic Metabolomics Resource Core</b> Postdoctoral Fellow, Department of Endocrinology (Advisor: Dr. K Sreekumaran Nair)	Rochester, MN 06/2014 – 06/2015

## Education

<b>Vanderbilt University</b> Ph.D. in Chemistry Dissertation: <i>Biomolecular Signatures of Disease via Ion Mobility and Mass Spectrometry Techniques</i> Advisor: John A. McLean, Stevenson Professor of Chemistry	Nashville, TN May 2014
<b>University of Florida</b> Bachelor of Science in Chemistry, <i>Cum Laude</i>	Gainesville, FL May 2009

## Awards and Recognitions

2024	Outstanding Reviewer, <i>Journal of the American Society for Mass Spectrometry</i>
2024	Chemist of the Year, Northeast Georgia Section of the American Chemical Society
2023	Rising Star in Measurement Science, <i>ACS Measurement Science Au</i>
2023	ASMS Research Award, \$35,000 award for early-career researchers in mass spectrometry
2023	Student Career Success Influencer Award, UGA graduating Class of 2022
2022	Lipid Leader, Avanti Polar Lipids
2022	Student Career Success Influencer Award, UGA graduating Class of 2021
2021	Emerging Investigator, <i>Journal of the American Society for Mass Spectrometry</i>
2020	Female Role Model in Analytical Chemistry, <i>Analytical and Bioanalytical Chemistry</i>
2019	Postdoc Mentoring Award Finalist, University of Washington Graduate School
2018	ACS Dan Su Travel Award to attend ACS Postdoc-to-Faculty Workshop at Spring ACS Meeting
2018	MSACL Young Investigator Travel Grant
2017	MSACL Young Investigator Travel Grant
2015	USP Global Fellowship, \$30,000 award to support a research project with mentorship from USP scientist

## Funding

### Active

- NSF/CBET Collaborative Research (#2305873, PI: Marklein/UGA)  
*Investigating the role and interplay of microenvironment, manufacturing, and metabolism on MSC production of extracellular vesicles*  
Role: Co-Principal Investigator  
06/2023 – 05/2026  
To Hines: \$253,339
- NIH/NIAID R01 (R01AI173144, PI: Hines)  
*Impacts of host lipid composition on antimicrobial susceptibilities of Staphylococcus aureus*  
Role: Principal Investigator  
12/2022 – 11/2027  
Total: \$2,302,379
- NIH/NIAID R01 (R01AI139238, PI: Brindley/UGA)  
*Defining the role of phosphatidylserine in hemorrhagic fever virus replication*  
Role: Senior & Key Personnel  
03/2022 – 02/2024  
To Hines: \$90,600
- NIH/NIAID R01 (R01AI163140, PI: Etheridge/UGA)  
*Elucidating the Role of Endocytosis Via the Cytostome in the Life Cycle of Trypanosoma cruzi*  
06/2021 – 06/2026  
To Hines: \$140,588

## Completed

1. NIH/NIAID Career Transition Award (K22AI143919, PI) 06/2020 – 05/2023  
*Elucidating altered lipid pathways in daptomycin-resistant pathogens* Total: \$269,937  
Role: Principal Investigator

## Publications (#Corresponding Author)

### Pre-Prints

1. K.R. Daga, A.M. Larey, M.G. Morfin, K. Chen, S. Bitarafan, J.M. Carpenter, H.M. Hynds, K.M. Hines, L.B. Wood, R.A. Marklein, "Microglia Morphological Response to Mesenchymal Stromal Cell Extracellular Vesicles Demonstrates EV Therapeutic Potential for Modulating Neuroinflammation," *bioRxiv* 2024.07.01.601612.

### Peer-Reviewed

36. S.C. Barbarek, R. Shah, S. Paul, G. Alvarado, K. Appala, E.C. Henderson, E.T. Strandquist, A. Pokorny, V.K. Singh, C. Gatto, J.U. Dahl, **K.M. Hines**, and B.J. Wilkinson, "Lipidomics of homeoviscous adaptation to low temperatures in *Staphylococcus aureus* utilizing exogenous straight-chain unsaturated fatty acids over biosynthesized endogenous branched-chain fatty acids," *Journal of Bacteriology*, Accepted June 9, 2024. doi.org/10.1101/2024.02.02.578686
35. C.D. Freeman, T. Hansen, R.J.B. Urbauer, B.J. Wilkinson, V.K. Singh, and **K.M. Hines**<sup>#</sup>, "Defective pgsA contributes to increased membrane fluidity and cell wall thickening in *S. aureus* with high-level daptomycin resistance," *mSphere*, 2024, doi.org/10.1128/msphere.00115-24.
34. Andrew M. Larey, Thomas M. Spoerer, Kanupriya R. Daga, Maria G. Morfin, Hannah M. Hynds, Jana M. Carpenter, **Kelly M. Hines**, and Ross A. Marklein, "High throughput screening of mesenchymal stromal cell morphological response to inflammatory signals for bioreactor-based manufacturing of extracellular vesicles that modulate microglia," *Bioactive Materials*, 2024, 37, 153-171.
33. Hannah M. Hynds and **Kelly M. Hines**<sup>#</sup>, "MOCCal: A Multi-Omic CCS Calibrator for Traveling Wave Ion Mobility Mass Spectrometry," *Analytical Chemistry*, 2024, 96, 1185-1194.
32. Jana M. Carpenter, Hannah M. Hynds, Kingsley Bimpeh, and **Kelly M. Hines**<sup>#</sup>, "HILIC-IM-MS for Simultaneous Lipid and Metabolite Profiling of Bacteria," *ACS Measurement Science Au*, 2024, 4(1), 104-116. **Invited contribution for 2023 Rising Stars in Measurement Science virtual special issue.**
31. Kingsley Bimpeh and **Kelly M. Hines**<sup>#</sup>, "A rapid single-phase extraction for polar staphylococcal lipids," *Analytical and Bioanalytical Chemistry*, 2023, 415, 4591-4602. **Invited contribution for Young Investigators in (Bio)-Analytical Chemistry 2023 Topical Collection.**
30. Hideaki Tomita, **Kelly M. Hines**, Josi M. Herron, Amy Li, David W. Baggett, and Libin Xu, "7-Dehydrocholesterol-derived oxysterols cause neurogenic defects in Smith-Lemli-Opitz syndrome," *eLife*, 2022, 11:e67141.
29. Hannah M. Hynds and **Kelly M. Hines**<sup>#</sup>, "Ion Mobility Shift Reagents for Lipid Double Bonds based on Paternò-Büchi Photoderivatization with Halogenated Acetophenones," *Journal of the American Society for Mass Spectrometry*, 2022, 33(10), 1982-1989.
28. Amy Li, **Kelly M. Hines**, Dylan H. Ross, James W. MacDonald, and Libin Xu, "Temporal changes in the brain lipidome during neurodevelopment of Smith-Lemli-Opitz syndrome mice," *Analyst*, 2022, 147, 1611-1621.
27. Katherine E. Havranek, **Kelly M. Hines**<sup>#</sup>, and Melinda A. Brindley<sup>#</sup>, "Untargeted lipidomics of vesicular stomatitis virus infected cells and viral particles," *Viruses*, 2022, 14(1), 3, doi: 10.3390/v14010003.
26. Rutan Zhang, Ismael Barreras Beltran, Nathaniel K. Ashford, Kelsi Penewit, Adam Waalkes, Elizabeth A. Holmes, **Kelly M. Hines**, Stephen J. Salipante, Libin Xu, Brian J. Werth, "Synergy between beta-lactams and lipo-, glyco-, and lipoglycopeptides is independent of the seesaw effect in methicillin-resistant *Staphylococcus aureus*," *Frontiers in Molecular Biosciences*, 2021, doi: 10.3389/fmolb.2021.688357.
25. Tianwei Shen, **Kelly M. Hines**, Nathaniel K. Ashford, Brian J. Werth, Libin Xu, "Varied Contribution of Phospholipid Shedding from Membrane to Daptomycin Tolerance in *Staphylococcus aureus*," *Frontiers in Molecular Biosciences*, 2021, 8, doi: 10.3389/fmolb.2021.679949.
24. Christian Freeman, Hannah M. Hynds, Jana M. Carpenter, Keerthi Appala, Kingsley Bimpeh, Shannon Barbarek, Craig Gatto, Brian J. Wilkinson, **Kelly M. Hines**<sup>#</sup>, "Revealing Fatty Acid Heterogeneity in Staphylococcal Lipids with

Isotope Labeling and RPLC–IM–MS,” *Journal of the American Society for Mass Spectrometry*, 2021, 32(9), 2376-2385. **Invited contribution for 2021 Emerging Investigators Special Focus.**

23. Marley Brimberry, Marina Ann Toma, **Kelly M. Hines**, William N. Lanzilotta, “HutW from *Vibrio cholerae* is an Anaerobic Heme-Degrading Enzyme with Unique Functional Properties,” *Biochemistry*, 2021, 60(9), 699-710.
22. Dylan H. Ross, Jang Ho Cho, Rutan Zhang, **Kelly M. Hines**, Libin Xu, “LiPydomics: A Python Package for Comprehensive Prediction of Lipid Collision Cross Sections and Retention Times and Analysis of Ion Mobility-Mass Spectrometry-based Lipidomics Data,” *Analytical Chemistry*, 2020, 92(22), 14967-14975.
21. Brian J. Werth, Nathaniel K. Ashford, Kelsi Penewit, Adam Waalkes, Elizabeth A. Holmes, Dylan H. Ross, Tianwei Shen, **Kelly M. Hines**, Stephen J. Salipante, Libin Xu, “Dalbavancin exposure *in vitro* selects for dalbavancin-non-susceptible and vancomycin-intermediate strains of methicillin-resistant *Staphylococcus aureus*,” *Clinical Microbiology and Infection*, 2020, 27(6), P910.E1-910.E8.
20. **Kelly M. Hines**, Gloria Alvarado, Xi Chen, Craig Gatto, Antje Pokorny, Francis Alonzo III, Brian J. Wilkinson, Libin Xu, “Lipidomic and Ultrastructural Characterization of the Cell Envelope of *Staphylococcus aureus* Grown in the Presence of Human Serum,” *mSphere*, 2020, 5, e00339-20. **Selected as feature image for issue.**
19. Keerthi Appala, Kingsley Bimpeh, Christian Freeman, **Kelly M. Hines**<sup>#</sup>, “Recent applications of mass spectrometry in bacterial lipidomics,” *Analytical and Bioanalytical Chemistry*, 2020, 412(24), 5935 - 5943. **Invited contribution for Female Role Models in Analytical Chemistry Special Issue.**
18. **Kelly M. Hines**, Tianwei Shen, Nathaniel Ashford, Adam Waalkes, Kelsi Penewit, Elizabeth Holmes, Katherine McLean, Stephen Salipante, Brian Werth, Libin Xu, “Occurrence of cross-resistance and beta-lactam seesaw effect in glycopeptide, lipopeptide, and lipoglycopeptide-resistant MRSA correlates with membrane phosphatidylglycerol levels”, *Journal of Antimicrobial Chemotherapeutics*, 2020, 75, 1182-1186.
17. Aurore Fleurie, Abdelrahim Zoued, Laura Alvarez, **Kelly M. Hines**, Felipe Cava, Libin Xu, Brigid M. Davis, Matthew K. Waldor, “A *Vibrio cholerae* BolA-like protein is required for proper cell shape and cell envelope integrity,” *mBio*, 2019, 10, e00790-19.
16. Josi M. Herron, **Kelly M. Hines**, Hideaki Tomita, Ryan P. Seguin, Julia Yue Cui, Libin Xu, “Multiomics investigation reveals benzalkonium chloride disinfectants alter sterol and lipid homeostasis in the mouse neonatal brain,” *Toxicological Sciences*, 2019, 171, 32-45. **Featured as the cover image of issue. Highlighted in C&E News August 3<sup>rd</sup>, 2020 issue.**
15. **Kelly M. Hines** and Libin Xu, “Lipidomic consequences of phospholipid synthesis defects in *Escherichia coli* revealed by HILIC-ion mobility-mass spectrometry,” *Chemistry and Physics of Lipids*, 2019, 219, 15-22.
14. Elijah J. Weber, Kevin A. Lidberg, Lu Wang, Theo K. Bammler, James W. MacDonald, Mavis J. Li, Michelle Redhair, William M. Atkins, Cecilia Tran, **Kelly M. Hines**, Josi Herron, Libin Xu, Maria Beatriz Monteiro, Susanne Ramm, Vishal Vaidya, Martti Vaara, Timo Vaara, Jonathan Himmelfarb, Edward J. Kelly, “Human kidney on a chip assessment of polymyxin antibiotic nephrotoxicity,” *JCI Insight*, 2018, 3, e123673.
13. Josi Herron, **Kelly M. Hines**, and Libin Xu, “Assessment of altered cholesterol homeostasis by xenobiotics using ultra-high performance liquid chromatography-tandem mass spectrometry,” *Current Protocols in Toxicology*, 2018, 78, e65.
12. David R. Raleigh, Navdar Sever, Pervinder K. Choksi, Monika Abedin Sigg, **Kelly M. Hines**, Bonne M. Thompson, Daniel Elnatan, Priyadarshini Jaishankar, Paola Bisignano, Francesc R. Garcia-Gonzalo, Alexis Leigh Krup, Markus Eberl, Eamon F. X. Byrne, Christian Siebold, Sunny Y. Wong, Adam R. Renslo, Michael Grabe, Jeffrey G. McDonald, Libin Xu, Philip A. Beachy, Jeremy F. Reiter, “Cilia-associated oxysterols activate Smoothed,” *Molecular Cell*, 2018, 72 (2), 316-327. **Feature as cover image of issue.**
11. Steven J. Fliesler, Neal S. Peachy, Josi Herron, **Kelly M. Hines**, Nadav I. Weinstock, Sriganesh Ramachandra Rao, Libin Xu, “Prevention of Retinal Degeneration in a Rat Model of Smith-Lemli-Opitz Syndrome,” *Scientific Reports*, 2018, 8 (1), 1286. Author Correction: 2018, 8 (1), 4289.
10. **Kelly M. Hines**, Adam Waalkes, Kelsi Penewit, Elizabeth A. Holmes, Stephen J. Salipante, Brian J. Werth, Libin Xu, “Characterization of the Mechanisms of Daptomycin Resistance among Gram-Positive Bacterial Pathogens by Multidimensional Lipidomics,” *mSphere*, 2017, 2 (6), e00492-17.
9. **Kelly M. Hines**, Dylan H. Ross, Kimberly L. Davidson, Matthew F. Bush, Libin Xu, “Large-Scale Structural Characterization of Drug and Drug-like Compounds by High-Throughput Ion Mobility-Mass Spectrometry,” *Analytical Chemistry*, 2017, 89 (17), 9023-9030.

8. **Kelly M. Hines**, Josi Herron, Libin Xu, "Assessment of altered lipid homeostasis by HILIC-ion mobility-mass spectrometry-based lipidomics," *Journal of Lipid Research*, 2017, *58*, 809-819.
7. Carrie J. Finno, Matthew H. Bordbari, Stephanie J. Valberg, David Lee, Josi Herron, **Kelly Hines**, Tamer Monsour, Erica Scott, Danika L. Bannasch, James Mickelson, Libin Xu, "Transcriptome profiling of equine vitamin E deficient neuroaxonal dystrophy identifies upregulation of liver X receptor target genes," *Free Radical Biology and Medicine*, 2016, *101*, 261-271.
6. **Kelly M. Hines**, Jody C. May, John A. McLean, Libin Xu, "Evaluation of Collision Cross Section Calibrants for Structural Analysis of Lipids by Traveling Wave Ion Mobility-Mass Spectrometry," *Analytical Chemistry*, 2016, *88* (14), 7329-7336.
5. **Kelly M. Hines**, G. Charles Ford, Katherine Klaus, Brian Irving, Beverly Ford, Kenneth Johnson, Ian Lanza, K. Sreekumaran Nair, "Application of high-resolution mass spectrometry to measure low abundance isotope enrichment in individual muscle proteins," *Analytical and Bioanalytical Chemistry*, 2015, *407* (14), 4045-4052.
4. **Kelly M. Hines**, Billy R. Ballard, Dana M. Marshall and John A. McLean, "Structural mass spectrometry of tissue extracts to distinguish cancerous and non-cancerous breast diseases," *Molecular BioSystems*, 2014, *10* (11), 2827-3032. **Featured as cover image of issue.**
3. J. Corey Evans, **Kelly M. Hines**, Jay G. Forsythe, Begum Erdogan, Mingjian Shi, Salisha Hill, Kristie L. Rose, John A. McLean and Donna J. Webb, "Phosphorylation of Serine 106 in Asef2 Regulates Cell Migration and Adhesion Turnover," *Journal of Proteome Research*, 2014, *13* (7), 3303-3313.
2. **Kelly M. Hines**, Samir Ashfaq, Jeffrey M. Davidson, Susan R. Opalenik, John P. Wikswo and John A. McLean, "Biomolecular Signatures of Diabetic Wound Healing by Structural Mass Spectrometry," *Analytical Chemistry*, 2013, *85* (7), 3651-3659. **Featured in The Analytical Scientist June 2013 Issue.**
1. Alexander P. Lamers, Mary E. Keithly, Kwangho Kim, Paul D. Cook, Donald F. Stec, **Kelly M. Hines**, Gary A. Sulikowski, and Richard N. Armstrong, "Synthesis of Bacillithiol and the Catalytic Selectivity of FosB-Type Fosfomycin Resistance Proteins," *Organic Letters*, 2012, *14* (20), 5207-5209.

#### Invited Book Chapters

3. Amy Li, **Kelly M. Hines**, Libin Xu, "Lipidomics by HILIC-Ion Mobility-Mass Spectrometry," Invited chapter for inclusion in "Ion Mobility Mass Spectrometry – Methods and Protocols," Giuseppe Paglia and Giuseppe Astarita, Eds. *Springer*. 2019.
2. Sarah M. Stow, Nichole M. Lareau, **Kelly M. Hines**, C. Ruth McNees, Cody R. Goodwin, Brian O. Bachmann, and John A. McLean, "Structural separations for natural product characterization by ion mobility-mass spectrometry: Fundamental theory to emerging applications," Invited chapter for inclusion in "Natural Products Analysis: Instrumentation, Methods and Applications," Vladimir Havlicek and Jaroslav Spizek, Eds. *John Wiley & Sons, Inc.* 2013.
1. **Kelly M. Hines**, Jeffrey R. Enders, and John A. McLean, "Multidimensional Separations by Ion Mobility-Mass Spectrometry," Invited chapter for inclusion in "Encyclopedia of Analytical Chemistry (online)," Robert Myers and David Muddiman, Eds. *John Wiley & Sons, Ltd.* 2012.

#### Select Presentations (Presenting author underlined)

##### Invited Keynote & Plenary Presentations

2. **Kelly M. Hines**, *Ion mobility-mass spectrometry for high-throughput multi-omics*, The Future of Ion Mobility-Mass Spectrometry in Measurement Science, ACS Innovation in Measurement Science Symposium, Virtual (October 2022).
1. **Kelly M. Hines**, *Exploring the influence of membrane lipid composition on antibiotic susceptibilities using multi-dimensional separations*, Labile Dissolved Organic Matter (DOM) Workshop, Chemical Currencies of a Microbial Planet (C-CoMP), Athens, GA (September 2022).

##### Invited Seminars

14. **Kelly M. Hines**, *Enabling high-throughput multi-omics with ion mobility-mass spectrometry*, Department of Chemistry, University of Wisconsin-Madison, Madison, WI (April 2024).
13. **Kelly M. Hines**, *Enabling high-throughput multi-omics with ion mobility-mass spectrometry*, Department of Chemistry, University of North Carolina, Chapel Hill, NC (March 2024).
12. **Kelly M. Hines**, *Enabling high-throughput multi-omics with ion mobility-mass spectrometry*, Department of Chemistry, Wichita State University, Wichita, KS (March 2024).

11. **Kelly M. Hines**, *Exploring the influence of membrane fluidity on antibacterial susceptibilities using multi-dimensional lipidomic methods*, Department of Chemistry, University of Arizona, Tucson, AZ (March 2024).
10. **Kelly M. Hines**, *Exploring the influence of membrane fluidity on antibacterial susceptibilities using multi-dimensional lipidomic methods*, Department of Chemistry, Texas A&M University, College Station, TX (March 2024).
9. **Kelly M. Hines**, *Enabling high-throughput multi-omics with ion mobility-mass spectrometry*, Department of Chemistry, University of Michigan, Ann Arbor, MI (February 2024).
8. **Kelly M. Hines**, *Enabling high-throughput multi-omics with ion mobility-mass spectrometry*, Department of Chemistry, Baylor University, Waco, TX (February 2024).
7. **Kelly M. Hines**, *Exploring the influence of membrane fluidity on antibacterial susceptibilities using multi-dimensional lipidomic methods*, Department of Chemistry, University of Texas at Austin, Austin, TX (January 2024).
6. **Kelly M. Hines**, *Exploring the influence of membrane lipid composition on antibacterial susceptibilities using multi-dimensional separations*, Community of Scholars Biomembranes Symposium, University of Tennessee, Knoxville, TN (April 2023).
5. **Kelly M. Hines**, *Leveraging Flow Injection and Ion Mobility-Mass Spectrometry for High-Throughput Multi-Omics*, Analytical Division Seminar, University of Florida, Gainesville, FL (February 2023).
4. **Kelly M. Hines**, *Ion Mobility-Mass Spectrometry for High-Throughput Omics Analyses*, Online Guest Lecture Seminar, University of California Davis West Coast Metabolomics Center, Virtual (December 2022).
3. **Kelly M. Hines**, *Isomeric lipid separations to assess membrane fluidity in antibiotic-resistant bacteria*, Department of Pharmaceutical and Biomedical Sciences Seminar, University of Georgia School of Pharmacy, Athens, GA (October 2021).
2. **Kelly M. Hines**, *Exploration of the Bacterial Lipidome using Hydrophilic Interaction Chromatography and Ion Mobility-Mass Spectrometry*, Department of Chemistry Seminar, Sewanee: The University of the South, Virtual (October 2020).
1. **Kelly M. Hines**, *Exploration of the Bacterial Lipidome using Hydrophilic Interaction Chromatography and Ion Mobility-Mass Spectrometry*, Department of Chemistry Seminar, Georgia Southern University, Virtual (October 2020).

#### Invited Oral Presentations

18. **Kelly M. Hines**, *Mass Spectrometry-based Approaches to Bacterial Lipidomics and Metabolomics*, ASM Microbe 2024, Atlanta, GA (June 2024).
17. **Kelly M. Hines**, *Exploring the influence of membrane fluidity on antibacterial susceptibilities using multi-dimensional lipidomic methods*, Membrane Lipidomics of Multiresistant Bacteria at the Biophysical Society 68<sup>th</sup> Annual Meeting, Philadelphia, PA (February 2024).
16. **Kelly M. Hines**, *Ion Mobility-Mass Spectrometry for High-Throughput Multi-Omics*, Eastern Analytical Symposium, Plainsboro, NJ (November 2023).
15. **Kelly M. Hines**, *Chromatographic Separations for Lipidomics*, ASMS Fall Workshop on Lipidomics, New Orleans, LA (November 2023).
14. **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, Ohio Mass Spectrometry Symposium, Columbus, OH (October 2023).
13. **Kelly M. Hines**, *Ion Mobility-Mass Spectrometry for High-Throughput Multi-Omics*, Waters' ASMS 2023 Wrap-Up, Alpharetta, GA (September 2023).
12. **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, Chinese American Society for Mass Spectrometry Virtual Conference, Virtual (August 2023).
11. **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, Pittcon Conference and Exposition, Philadelphia, PA (March 2023).
10. **Kelly M. Hines**, *Leveraging Flow Injection and Ion Mobility-Mass Spectrometry for High-Throughput Multi-Omics*, Southeastern Regional Meeting of the American Chemical Society (SERMACS), San Juan, Puerto Rico (October 2022).
9. Christian Freeman, Craig Gatto, Brian Wilkinson, and **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, Ion Mobility Separations Symposium, American Chemical Society Fall 2022, Chicago, IL (August 2022).

8. **Kelly M. Hines**, *RPLC-IM-MS to Monitor Host-Derived Lipid Utilization by Staphylococcus aureus*, Lipidomics Gordon Research Conference, Newry, ME (August 2022).
7. **Kelly M. Hines**, *Ion Mobility-Mass Spectrometry Methods and Resources for Lipidomics*, Ion Mobility Workshop, Metabolomics Society 2022, Valencia, Spain (June 2022).
6. **Kelly M. Hines**, *Isomeric lipid separations to assess membrane fluidity in antibiotic-resistant bacteria*, 100 min with ILS: New Year, New Lipids, Virtual (January 2022).
5. **Kelly M. Hines**, *Confidence in Lipid Identifications by Mass Spectrometry*, Metabolomics Interest Group Workshop at the 69<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA (November 2021).
4. **Kelly M. Hines**, Christian Freeman, Kingsley Bimpeh, and Hannah Hynds, *Hines Lab Showcase*, 2021 Mass Spectrometry: Applications to the Clinical Laboratory (MSACL) Connect Series, Virtual (August 2021).
3. **Kelly M. Hines**, *Revealing the Heterogeneity of Bacteria Glycero- and Phospholipids by RPLC-IM-MS*, 2021 Glycosciences Training Program Retreat, Virtual (January 2021).
2. **Kelly M. Hines**, *Ten Years and Two Coasts: My Career in Ion Mobility*, Waters Corp. Southeastern Seminar Series, Virtual (May 2020).
1. **Kelly M. Hines**, *Exploration of the Bacterial Lipidome using Hydrophilic Interaction Chromatography and Ion Mobility-Mass Spectrometry*, Meeting of the Northeast Georgia Chapter of the American Chemical Society, Athens, GA (November 2019).

#### Contributed Oral Presentations (\*Presented by Hines Lab graduate student)

13. \***Hannah M. Hynds**, Jana M. Carpenter, Kingsley Bimpeh, and **Kelly M. Hines**, *High-Throughput Multi-Omics for Bacterial Identification and Antibiotic Susceptibility Profiling*, 72<sup>nd</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Anaheim, CA (June 2024).
12. \***Jana M. Carpenter**, Hannah M. Hynds, Kingsley Bimpeh, and **Kelly M. Hines**, *A Combined Lipid- and Metabolomic Workflow for Differentiation of Bacteria Species and Strains*, Mass Spectrometry and Advances in the Clinical Laboratory, Monterey, CA (March 2024).
11. \***Christian D. Freeman**, Craig Gatto, Brian J. Wilkinson, Vineet K. Singh, and **Kelly M. Hines**, *Connecting Altered Branched Fatty Acid Distributions with Membrane Fluidity in Daptomycin-Resistant Staphylococcus Aureus*, 71<sup>st</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Houston, TX (June 2023).
10. \***Jana M. Carpenter**, Kingsley Bimpeh, Hannah M. Hynds, and **Kelly M. Hines**, *Development of a Multi-Omic Approach for Microorganism Identifications*, 71<sup>st</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Houston, TX (June 2023).
9. Jana M. Carpenter, Hannah M. Hynds, Kingsley Bimpeh, and **Kelly M. Hines**, *Leveraging Ion Mobility-Mass Spectrometry for High-Throughput Multi-Omics*, Mass Spectrometry and Advances in the Clinical Laboratory, Monterey, CA (April 2023).
8. Christian D. Freeman, Craig Gatto, Brian J. Wilkinson, Vineet Singh, and **Kelly M. Hines**, *High-level daptomycin resistance is supported by increased membrane fluidity in Staphylococcus aureus with defective phosphatidylglycerol synthase*, 33<sup>rd</sup> Sanibel Conference (Membrane Proteins and Their Complexes: Mass Spectrometry and Beyond), St. Pete Beach, FL (January 2023).
7. Christian Freeman, Craig Gatto, Brian Wilkinson, and **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, Joint 1<sup>st</sup> International Lipidomics Society Conference, Virtual/Regensburg, Germany (October 2021).
6. **Kelly M. Hines**, Gloria Alvarado, Craig Gatto, Antje Pokorny, Brian J. Wilkinson, Libin Xu, *Tracking the incorporation of host serum lipids into the membrane lipids of Staphylococcus aureus with HILIC-IM-MS*, 1<sup>st</sup> Annual Conference of the Metabolomics Association of North America, Atlanta, GA (November 2019).
5. **Kelly M. Hines**, Adam Waalkes, Kelsi Penewit, Elizabeth A. Holmes, Stephen J. Salipante, Brian J. Werth, Libin Xu, *Alteration of membrane lipids is associated with glycopeptide, lipopeptide and lipoglycopeptide cross-resistance and the  $\beta$ -lactam "seesaw effect" in MRSA*, University of Washington Postdoctoral Association Annual Research Symposium, Seattle, WA (April 2018).
4. **Kelly M. Hines**, Adam Waalkes, Kelsi Penewit, Elizabeth A. Holmes, Stephen J. Salipante, Brian J. Werth, Libin Xu, *Lipid signatures as diagnostic predictors of  $\beta$ -lactam "seesaw effect" in glycopeptide, lipopeptide, and lipoglycopeptide resistance*, Mass Spectrometry: Applications to the Clinical Lab 2018 US Annual Conference & Exhibits, Palm Springs, CA (January 2018). **Young Investigator Travel Grant**

3. **Kelly M. Hines**, Brian J. Werth, Libin Xu, *Lipidomics Analysis of Antimicrobial-Resistant Bacteria by HILIC-Ion Mobility-Mass Spectrometry*, Federation of Analytical Chemistry and Spectroscopy Societies SciX Conference, Reno, NV (October 2017).
2. **Kelly M. Hines**, Brian J. Werth, Libin Xu, *Monitoring Alterations of Bacterial Lipidome in Antimicrobial Resistance with HILIC-IM-MS*, 65<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Indianapolis, IN (June 2017).
1. **Kelly M. Hines**, Brian J. Werth, Libin Xu, *Identification of Altered Lipidome in Lipopeptide-Resistant Bacteria by HILIC-IM-MS*, Mass Spectrometry: Applications to the Clinical Lab 2017 US Annual Conference & Exhibits, Palm Springs, CA (January 2017). **Young Investigator Travel Grant**

**Hines Lab Poster Presentations** (Presented by: \*Hines Lab graduate student; †Hines Lab undergraduate student)

32. \*Jana M. Carpenter, Hannah M. Hynds, Kingsley Bimpeh, and **Kelly M. Hines**, *A Multi-Omic Identification Protocol for High-Throughput Bacterial Analysis*, 72<sup>nd</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Anaheim, CA (June 2024).
31. \*David Brewer and **Kelly M. Hines**, *Analysis of Tissue Lipid Incorporation by Staphylococcus aureus*, 72<sup>nd</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Anaheim, CA (June 2024).
30. \*Rebekah L. Phelan, H.M. Hynds and **K.M. Hines**, *Analysis of Enterococcus faecalis Glycerophospholipids and Fatty Acid Incorporation by Ion Mobility-Mass Spectrometry and Paternò-Büchi C=C Analysis*, 72<sup>nd</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Anaheim, CA (June 2024).
29. \*Hannah Hynds and **Kelly M. Hines**, *A Comprehensive TWIM Calibration Method for Obtaining High-Throughput Multi-Omic Collision Cross Section Values*, 71<sup>st</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Houston, TX (June 2023).
28. \*Kingsley Bimpeh and **Kelly M. Hines**, *An Efficient Monophasic Extraction Method for High-Throughput Bacterial Lipidomics*, 71<sup>st</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Houston, TX (June 2023).
27. \*Keerthi Appala and **Kelly M. Hines**, *Assessing the effects of exogenous fatty acids and FASII inhibitors on lipid profiles and growth patterns of Staphylococcus aureus*, 71<sup>st</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Houston, TX (June 2023).
26. †Hannah M. Hynds, Kingsley Bimpeh, Jana M. Carpenter, and **Kelly M. Hines**, *High-throughput multi-omics for bacterial identification and susceptibility profiling*, Lipidomics Gordon Research Conference, Newry, ME (August 2022).
25. \*Christian D. Freeman, Craig Gatto, Brian Wilkinson, Vineet Singh, and **Kelly M. Hines**, *Evaluating the effects of fatty acid supplementation on lipid composition in daptomycin-resistant Staphylococcus aureus using RPLC-IM-MS*, Lipidomics Gordon Research Conference, Newry, ME (August 2022).
24. \*Kingsley Bimpeh and **Kelly M. Hines**, *The MAW Method: A method for high-throughput lipid extraction from bacteria*, Lipidomics Gordon Research Conference, Newry, ME (August 2022).
23. \*Keerthi Appala and **Kelly M. Hines**, *Effects of exogenous fatty acids and FASII inhibition on the membrane lipids and antibiotic susceptibilities of Staphylococcus aureus*, Lipidomics Gordon Research Conference, Newry, ME (August 2022).
22. \*Shivani Nagode and **Kelly M. Hines**, *Lipoteichoic acid synthase enzyme inhibition as a novel approach to study daptomycin-resistant pathogens*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).
21. †Hannah M. Hynds and **Kelly M. Hines**, *Halogenated Paternò-Büchi Reagents for Ion Mobility-Mass Spectrometry Lipid C=C Analysis*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).
20. †Christian D. Freeman, Craig Gatto, Brian Wilkinson, Vineet Singh, and **Kelly M. Hines**, *Unveiling lipid composition changes in different straight chain fatty acid growing conditions for daptomycin resistant Staphylococcus aureus using RPLC-IM-MS*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).

19. \*[Jana M. Carpenter](#) and **Kelly M. Hines**, *Identifying Pathways for Growth and Survival in Antibiotic Resistant Strains of Staphylococcus aureus*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).
18. \*[Kingsley Bimpeh](#) and **Kelly M. Hines**, *An efficient and reliable monophasic extraction method for high-throughput lipidomics*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).
17. \*Keerthi Appala, \*Christian D. Freeman, Brian Wilkinson, Vineet Singh, and **Kelly M. Hines**, *Daptomycin tolerance in Staphylococcus aureus is supported by host-derived unsaturated fatty acids*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).
16. \*[Keerthi Appala](#) and **Kelly M. Hines**, *Evaluating membrane phospholipid changes in Staphylococcus aureus using straight-chain fatty acids and FASII inhibition*, 70<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN (June 2022).
15. †[My Nguyen](#) and **Kelly M. Hines**, *Adapting the Lipid Maps Tools Structure Generator for Atypical Bacterial Lipids*, Center for Undergraduate Research Opportunities Symposium, University of Georgia (April 2022).
14. †[Stephanie M. Paulson](#), \*Kingsley Bimpeh, and **Kelly M. Hines**, *Determination of the Limits of Detection and Quantitation for Lipids in Staphylococcus aureus using HILIC-IM-MS*, Center for Undergraduate Research Opportunities Symposium, University of Georgia (April 2022).
13. †[Andrew Perciaccante](#), \*Keerthi Appala, and **Kelly M. Hines**, *Incorporation of Exogenous Fatty Acids by E. faecalis and the Effects on Daptomycin Resistance in vitro*, Center for Undergraduate Research Opportunities Symposium, University of Georgia (April 2022).
12. \*[Hannah M. Hynds](#) and **Kelly M. Hines**, *Halogenated Paternò-Büchi Reagents for Phospholipid C=C Analysis by Ion Mobility-Mass Spectrometry*, 69<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA (November 2021).
11. \*[Kingsley Bimpeh](#) and **Kelly M. Hines**, *The AMW Method: A method for high throughput lipid extraction from bacteria*, 69<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA (November 2021).
10. \*[Jana M. Carpenter](#) and **Kelly M. Hines**, *Developing a robust metabolomics method for Staphylococcus aureus*, 69<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA (November 2021).
9. \*[Christian Freeman](#), Craig Gatto, Brian Wilkinson, and **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, 69<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA (November 2021).
8. \*[Keerthi Appala](#), †Jeanne Cooper, and **Kelly M. Hines**, *A C30 RPLC-IM-MS method for resolving lipids with fatty acid isomers in Enterococcus faecalis*, 69<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Philadelphia, PA (November 2021).
7. \*Christian Freeman, \*Jana Carpenter, \*Keerthi Appala, and **Kelly M. Hines**, *Assessing membrane fluidity of antibiotic-resistant Staphylococcus aureus using an RPLC-IM-MS method for isomeric phospholipid separations*, 3<sup>rd</sup> Annual Metabolomics Association of North America (MANA) Conference, Virtual (October 2021).
6. \*Christian Freeman, \*Hannah M. Hynds, \*Jana M. Carpenter, \*Keerthi Appala, \*Kingsley Bimpeh, Shannon Barbarek, Craig Gatto, Brian J. Wilkinson, **Kelly M. Hines**, *Separation of diacyl lipids containing branched- and straight-chain fatty acids in Staphylococcus aureus by RPLC-IM-MS*, Metabolomics 2021 Online: the 17<sup>th</sup> Annual Conference of the Metabolomics Society, Virtual Conference (June 2021).
5. \*[Keerthi Appala](#) and **Kelly M. Hines**, *Effect of exogenous fatty acids on daptomycin susceptibility in Staphylococcus aureus*, 2021 World Microbe Forum, Virtual Conference (June 2021).
4. \*[Kingsley Bimpeh](#) and **Kelly M. Hines**, *High-throughput method for lipid extraction in bacteria*, 2021 World Microbe Forum, Virtual Conference (June 2021).
3. \*[Christian Freeman](#), \*Hannah M. Hynds, \*Jana M. Carpenter, \*Keerthi Appala, \*Kingsley Bimpeh, Shannon Barbarek, Craig Gatto, Brian J. Wilkinson, **Kelly M. Hines**, *Revealing branched- and straight-chain diacyl lipids in Staphylococcus aureus via reversed-phased liquid chromatography-ion mobility-mass spectrometry*, 2021 World Microbe Forum, Virtual Conference (June 2021).

2. Katherine E. Havranek, Melinda A. Brindley, **Kelly M. Hines**, *Untargeted lipidomics of viral particles and cell lysates following vesicular stomatitis virus infection*, 68<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Virtual Conference (June 2020).
1. \***Christian Freeman**, Elijah Roberts, \*Kingsley Bimpeh, †Tabitha Lowe, †Shane Vahjen, \*Keerthi Appala, **Kelly M. Hines**, *A Rapid HILIC-IM-MSE Method and Structure Database for Bacterial Lipidomics*, 68<sup>th</sup> American Society for Mass Spectrometry Conference on Mass Spectrometry and Allied Topics, Virtual Conference (June 2020).

## Professional Memberships

American Society for Mass Spectrometry, American Chemical Society, American Society for Microbiology, International Lipidomics Society, Metabolomics Society, Metabolomics Association of North American

## Professional Service

- 2023- Member-at-Large for Publications, Board of the American Society for Mass Spectrometry
- 2022 Faculty Search Committee, Department of Biochemistry and Molecular Biology, University of Georgia
- 2022- Steering Committee Member, Microbial Lipids Interest Group, International Lipidomics Society
- 2022- Executive Committee Member, Department of Chemistry, University of Georgia
- 08/2022 Presider, Ion Mobility Separations Symposium, ACS Fall 2022
- 11/2021 Chair, Lipidomics: New Technologies and Applications Oral Session of the 69<sup>th</sup> ASMS Conference
- 11/2021 Panelist, *Probability-based Metabolite Identification Confidence: How Can We Get There?* Evening Workshop at the 69<sup>th</sup> ASMS Conference
- 04/2021 Reviewer, National Science Foundation Division of Chemistry
- 2021- Editorial Board Member, Journal of Bacteriology, American Society for Microbiology
- 2021- Executive Committee Member, Glycosciences Training Program (T32), University of Georgia
- 2020-2021 Mentor, Females in Mass Spectrometry (FeMS) Mentoring Program
- 2020 Selection Committee, American Society for Mass Spectrometry Emerging Talent: Academia Seminars
- 2020-2022 Committee Member, American Society for Mass Spectrometry Ion Mobility Special Interest Group
- 2019- Organizing Committee, Atlanta-Area Mass Spectrometry Discussion Group
- 2019- Graduate Recruitment Committee, Department of Chemistry, University of Georgia
- 2019-2020 Judge of Small Molecules Section of Undergraduate Poster Competition, Annual Conference of the American Society for Mass Spectrometry
- 2018- *Ad hoc* reviewer for journals including *Analytical Chemistry*, *Journal of the American Society for Mass Spectrometry*, *Analytical and Bioanalytical Chemistry*, *Analytical Chemistry Acta*, *Trends in Analytical Chemistry*, *ACS Omega*, *Journal of Bacteriology*, *mSystems*, *Scientific Reports*, *Journal of Proteome Research*
- 2016-2018 *Ad hoc* reviewer for Mayo Clinic Metabolomics Resource Core Pilot and Feasibility Program grants

## Teaching Experience

### University of Georgia, Department of Chemistry

- 2019- CHEM 3300: Modern Methods of Instrumental Analysis (Undergraduate-level)
- 2021- CHEM 8890: Special Topics in Analytical Chemistry, Omics (Graduate-level)

## Mentoring Experience

### University of Georgia, Department of Chemistry

- 11 Chemistry Graduate Students (PhD: Appala, Bimpeh, Freeman, Carpenter, Hynds, Phelan, Brewer, Pan, Park, Torrence; MS: Clerici)
  - Keerthi Appala, 2020-21 NIH T32 Glycosciences Training Grant Trainee
  - Christian Freeman, 2021 UGA ARCS Scholar, 2023 NE Georgia ACS Outstanding Graduate Student
  - Jana M. Carpenter, 2022 UGA ARCS Scholar, 2022-23 NIH T32 Glycoscience Training Grant Trainee
- 6 Undergraduate Chemistry Majors (Vahjen, Lowe, Perciaccante, Paulson, Nguyen, Miller, Khan)
- 1 Undergraduate Biology Major (Bulatao)
- 2 Summer REU Students (Cooper, Rakestraw)