A. PERSONAL STATEMENT

The glycocode, or combinatorial patterns of glycosylation that relay biological information, functions in essential roles that govern human health and myriad diseases (e.g., cancer, infectious diseases, autoimmune diseases). However, we lack a fundamental understanding of the rules that define changes in glycosylation, which hinders insight into how the glycocode contributes to biological function at a molecular level. Our perspectives on the glycocode remain deficient because the non-templated complexity of glycosylation creates analytical challenges that have severely limited our ability to study glycoconjugates. I aim to solve these challenges. I leverage my graduate training in mass spectrometry (MS)-based proteomics and my postdoctoral work in chemical glyciobiology to develop innovative bioanalytical and chemical biology technologies to investigate essential principles of glycocode regulation and dysregulation. Specifically, I am interested in using cutting-edge technologies to understand how altered cell surface phenotypes (i.e., glycocalyx status) manifest in cancer progression and drive metastasis. Through a combination of MS-based multi-omics, bioinformatics, and chemical biology, my goal is to use a systems-level approach to glyciobiology to further our understanding of human health and disease and advance therapeutic glycoscience.

B. SELECTED HONORS AND AWARDS (Full list below)

2016 – 2022 NIH National Cancer Institute Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)
2021 Rising Star in Proteomics and Metabolomics (40 under 40), Journal of Proteome Research
2020 Selected as ASMS Emerging Talent in Academia, American Society for Mass Spectrometry
2019 ASMS Postdoctoral Career Development Award, American Society for Mass Spectrometry
2018 Richard and Joan Hartl Award for Research Excellence in Analytical Chemistry, UW-Madison
2017 FACSS Student Award, Federation of Analytical Chemistry and Spectroscopy Societies
2017 Roger J. Carlson Memorial Award for Research Excellence, Dept. of Chemistry, UW-Madison
2015 ASMS Graduate Student Award, American Society for Mass Spectrometry
2014 – 2016 National Science Foundation (NSF) Graduate Research Fellow
2012 Algernon Sydney Sullivan Award (top undergraduate student), USC
2011 Presidential Volunteer Service Award, Gold Level (250+ hours), Office of President Barack Obama
2011 Wilson-Kibler Bicentennial Leadership Award, USC
2010 Phi Beta Kappa

C. PUBLICATIONS (ordered by most recent within each section, full list on PubMed available here)

First Author and Submitting Author Publications


**Highlighted on Genome Web: https://www.genomeweb.com/proteomics-protein-research/new-mass-spec-fragmentation-technique-could-boost-shotgun-mass-spec**


**Highlighted on Genome Web: https://www.genomeweb.com/proteomics-protein-research/new-mass-spec-fragmentation-technique-could-boost-shotgun-mass-spec**


**Contributing Author Publications**


Pre-prints and Manuscripts in Review


D. RESEARCH SUPPORT

F99/K00 (CA212454) NIH/NCI
Uniting Mass Spectrometry and Glycoscience to Investigate Cancer Biology 09/15/2016-08/31/2022
1F99CA212454 F99 Graduate Fellow 09/15/2016-08/26/2018
4K00CA212454 K00 Postdoctoral Fellow 08/27/2018-08/31/2022
Role: Principal Investigator
The graduate phase (F99) aims to develop mass spectrometry tools to enable global glycoproteome characterization and apply it to study cancer progression, and the postdoctoral phase (K00) focuses on training in cancer glycobiology, mainly using chemical tools to engineer the glycocalyx to understand glycosignatures of cancer aggressiveness.

Completed Research Support:
NSF Graduate Research Fellowship (DGE-1256259)
New Technology to Monitor Histidine Phosphorylation in Mammalian Mitochondria 06/01/2014-09/14/2016
The major goal of this project was to develop negative electron transfer dissociation mass spectrometry instrumentation and methodologies to enable high-throughput proteomic analyses of peptide anions, with the goal of characterizing the unknown role(s) of phosphohistidine in mammalian systems.

E. PRESENTATIONS (ordered by most recent, only first-author presentations counted)

Oral Presentations (5 selected from 34 total)

1. Riley NM. Glycoproteomic tools to investigate mucin domain glycoproteins. Leiden University Medical Center Glyco Series. June 2021, remote presentation at virtual meeting. (Invited by: Y. van der Burgt)


Poster Presentations (5 selected of 30 total)


F. TEACHING

Instructor, Skyline Online Course Introduction to Targeted Proteomics: SRM/MRM and PRM, April 2021
Presented a lecture and led a tutorial session of 50+ attendees on indexed retention time and how to process data within the Skyline ecosystem. Also contributed to live question and answer sessions.
Guest Lecturer, BIOS 227, Mass Spectrometry & Proteomics: Opening the Black Box, Stanford Univ., Winter 2021
Developed and presented a lecture on the combination of glycobiology and mass spectrometry at the invitation of course leader Prof. Sharon Pitteri.

Guest Lecturer, Stanford University Mass Spectrometry Seminar Series, Fall 2020
Designed and presented two lectures on fundamentals and cutting-edge research in glycoproteomics
Seminar 1: Fundamentals: An introduction to MS-based glycoproteomics, Sept 3, 2020
Seminar 2: Reasons to be excited about current efforts in glycoproteomics, Oct 1, 2020

Graduate Lecturer, Biochemistry 660, Biochemical Techniques, UW-Madison, Fall 2015, Fall 2016, Fall 2017
Designed and taught three lectures on bioanalytical mass spectrometry to graduate students
Developed and graded two problem sets to correspond with lectures
Integrated written and oral feedback from Prof. Marv Wickens, other graduate lecturers, and students for constant improvement in lecture delivery, style, and content

Graduate Lecturer, The Data Revolution in Science and Medicine, UW-Madison, Fall 2017
Designed and taught one lecture on bioanalytical mass spectrometry and how proteomics fits into the landscape of the big data revolution to second year MD-PhD students (School of Medicine and Public Health, SMPH).

Graduate Facilitator, Food, Fasting, and Fitness, UW-Madison, Spring 2018
Facilitated a “Metabolic Adaptation” active learning module for a first-year medical student course (SMPH).
Worked with a faculty leader, lead discussion about introductory material, and guided student learning through an online module that the students completed in a medium group setting with approx. 6 students per group.

Teaching Assistant, Chemistry Department, UW-Madison
CHEM 329, Analytical Chemistry for Majors, approx. 20 hours per week, Spring 2014
CHEM 104, General Chemistry II, approx. 25 hours per week, Fall 2012
Chemistry Tutor, CHEM 104, approx. 2 hours per week, Spring 2014

University 101 Program, Division of Student Affairs and Academic Support, USC, 2009-2011
Peer Leader, UNIV 101, The Student in University, Fall 2009, Fall 2010
Designed and implemented lesson plans, managed student issues, graded papers and projects, and provided feedback on student presentations; worked as a team with co-instructor, serving as a mentor to 25 freshmen and fostering leadership development in first-year students.

Peer Leader Captain, EDLP 520 (School of Education Course), The Teacher as Manager, Fall 2011
Co-instructed a 3-hour credit education school course that taught classroom leadership; designed and implemented lesson plans, facilitated discussion about how to grow in their mentor and leadership skills.

Tutored middle school and high school students in math and science subjects, approx. 3 hours per week.

Designed, constructed, and presented educational programs for audiences ranging from K-12 students to adult community groups, approx. 2 hours per week.

G. PEER-REVIEW PARTICIPATION

<table>
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<tr>
<th>Publisher (Example Journals)</th>
<th>Number of Reviews Completed</th>
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<tr>
<td></td>
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<tr>
<td>American Chemical Society (Analytical Chemistry, JASMS)</td>
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<tr>
<td>Cell Press (Cell Reports Methods)</td>
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<tr>
<td>Nature Publishing Group (Nature Methods/Communications)</td>
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<tr>
<td>Royal Society of Chemistry (Molecular Omics)</td>
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<tr>
<td>Other (Mol. &amp; Cell. Proteomics, Int. J. of Mass Spec., JCB)</td>
<td>1</td>
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<tr>
<td>Total</td>
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H. LEADERSHIP, SERVICE, MENTORING, AND DEI (DIVERSITY, EQUITY, & INCLUSION) OUTREACH

Mentor, FeMS Small Group Mentorship Program, 2020-present
Serve as a mentor for 12-15 mentees from around the country as part of a discussion group and support network. As a mentor, I support group members on their diverse paths in science and share my STEM experiences to provide perspectives and resources for their career development.

Stanford Science Penpals, Stanford University, 2018-present
Leadership Team, Postdoc Liaison (2019-present), School Liaison (2020-present)
Exchange letters with students in 6th-12th grade classrooms from across the US. The goal of this program is to expose students to diverse scientific careers, answer science questions, and share the love of science.

ADVANCE Summer Institute Mentor, Stanford University, 2019, 2020, 2021
An intensive 8-week transition program created by Biomedical Association for the Interests of Minority Students run by Stanford Biosciences for incoming graduate students from diverse backgrounds. As a Postdoc Mentor, I help my mentee to prepare and present at weekly journal club. Following the ADVANCE program, I have remained in contact with both my mentees to help with both research and non-scientific questions.

Stanford Summer Research Program (SSRP) - Amgen Scholars Program, Stanford University, 2021
Served on Application Review Committee to select scholars for 9-week summer program that provides bioscience research opportunities for students who would bring diversity to STEM graduate programs.

Stanford Omics Mass Spectrometry Group, Stanford University, 2019-present
Co-Leader (2021-present). A group of mass spectrometry-minded researchers on Stanford’s campus that meet quarterly to present research and discuss new papers, techniques, and issues. As Co-Leader, I organize each meeting, recruit speakers, started and maintained the group’s website, and guide discussion.

Judge, Undergraduate Poster Session, Annual ASMS Conference, 2019, 2020
Serve as a judge for undergraduate posters presented at the annual ASMS Conference on Mass Spectrometry and Allied Topics. Provided critical feedback and scored posters to ultimately pick prize winners.

Graduate Leadership Experience: Graduate Student Faculty Liaison Committee; John L. Schrag Fund Committee (Co-Founder, Co-President); Junior Science Café; Wisconsin Science Festival; Wisconsin Saturday Science; Chemistry Opportunities (CHOPs) at UW-Madison

Undergraduate Leadership Experience: University Ambassador (President, Captain of Mentor Program, Presidential Ambassador); Pillars for Carolina (Co-Founder, Director of Foundations); Honors Council (President, Vice President); Orientation Leader (President, Vice President); Resident Mentor; Men’s Club Rugby (Team Captain)

I. PROFESSIONAL DEVELOPMENT AND AFFILIATIONS

American Society for Mass Spectrometry, 2013-present
American Chemical Society, 2013-present
US Human Proteome Organization, 2015-present
Society for Glycobiology, 2017-present
American Society for Biochemistry and Molecular Biology, 2020-present
Tegmine Therapeutics, Inc., Scientific Advisor, Scientific Advisory Board, 2020-present

J. HONORS AND AWARDS FULL LIST

Postdoctoral
2018 – 2022 NIH National Cancer Institute K00 Postdoctoral Fellow (K00CA212454)
2021 Rising Star in Proteomics and Metabolomics (40 under 40), Journal of Proteome Research
2021 ASBMB Postdoctoral Annual Meeting Award
2021 US HUPO Postdoctoral Award Honorable Mention
2021 Society for Glycobiology Travel Award
2020 Selected as ASMS Emerging Talent in Academia, American Society for Mass Spectrometry
2020 Keystone Symposia Scholarship (Symposium: Proteomics in Cell Biology and Disease)
2020 Stanford University Mass Spectrometry Research Applications Symposium Poster Award
2019 ASMS Postdoctoral Career Development Award, American Society for Mass Spectrometry
**Graduate**

2018  Human Proteomics Symposium Rising Star
2018  Student Research Grants Competition Conference Award, Graduate School, UW-Madison
2018  Richard and Joan Hartl Award for Research Excellence in Analytical Chemistry, UW-Madison
2017  Society for Glycobiology Travel Award
2017  Outstanding Oral Presentation Award, Midwest Carbohydrate and Glycobiology Symposium
2017  FACSS Student Award, Federation of Analytical Chemistry and Spectroscopy Societies
2017  Dept. of Biomolecular Chemistry Travel Award, UW-Madison
2017  Roger J. Carlson Memorial Award for Research Excellence, Dept. of Chemistry, UW-Madison
2017  1st Place in Poster Competition, Dept. of Chemistry Poster Session, UW-Madison
2017  Graduate Student Travel Award, Dept. of Chemistry, UW-Madison
2016  Marg Northcott Student Award, Lake Louise Tandem MS Workshop
2016 – 2022 NIH National Cancer Institute Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)
2015  1st Place in Poster Competition, Human Proteomics Symposium
2015  ASMS Graduate Student Award, American Society for Mass Spectrometry
2014  Richard A. Schaeffer ASMS Travel Award
2014  Asilomar Conference Travel Grant, ASMS
2014 – 2016 National Science Foundation (NSF) Graduate Research Fellow
2012  Pei Wang Graduate Fellowship, Department of Chemistry, UW-Madison
2012  Louise McBee Graduate Fellowship, Alpha Lambda Delta Honors Society

**Undergraduate**

2012  **Algernon Sydney Sullivan Award** (top undergraduate student), USC
2012  ODK Leader of the Year, Omicron Delta Kappa Honors Society Chi Circle, USC
2012  Outstanding Senior Award, USC
2012  Joseph H. Gibbons Outstanding Senior Award, Omicron Delta Kappa Honors Society
2011, 2012  American Institute of Chemists Foundation Award, USC
2011  Presidential Volunteer Service Award, Gold Level (250+ hours), Office of President Barack Obama
2011  Student Body President’s Award, USC
2011  Wilson-Kibler Bicentennial Leadership Award, USC
2011  Leadership Scholar Award, USC
2010  Rising Senior Award, Dept. of Chemistry and Biochemistry, USC
2010  Phi Beta Kappa
2009 – 2010  Cultural Ambassadors Scholarship, Rotary International
2009  University of South Carolina Homecoming King
2009  Outstanding Freshman Advocate, USC (first undergraduate to win the award)
2009  Jo Anne J. Trow Academic Scholar, Alpha Lambda Delta Honors Society
2008 – 2010  Magellan Undergraduate Research Grant, USC
2007 – 2011  Jamie and Cory Foundation Academic Scholar
2007 – 2011  Robert C. Byrd Academic Scholar
2007 – 2011  Robert C. McNair Scholar, USC (full tuition scholarship awarded for academic merit)