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 fundamental insights 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. My group aims to solve these challenges. We leverage state-of-the-art mass spectrometry and chemical glycobiology to develop innovative technologies for investigating essential principles of glycocode regulation and dysregulation. Specifically, we are interested in understanding 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, our goal is to use a systems-level approach to glycobiology to further our understanding of human health/disease and advance therapeutic glycoscience.

B. SELECTED HONORS AND AWARDS (Full list below)

2022 – 2023 NIH Pathway to Independence Award (K99/R00)
2016 – 2022 NIH National Cancer Institute Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)
2023 HUPO Rising Star Award
2021 Rising Star in Proteomics and Metabolomics (40 under 40), Journal of Proteome Research
2020 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 Algermon Sydney Sullivan Award (top undergraduate student), USC
2011 Presidential Volunteer Service Award, Gold Level (250+ hours), Office of President Barack Obama
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


or targeted degradation of cancer

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**Contributing Author Publications**


(27) Pelton EL, **Riley NM,** Flynn RA, Bertozzi CR. Galectin-3 does not interact with RNA directly. *Glycobiology, 2023,* in press.


Book Chapters

Other publications
Pre-prints and Manuscripts in Review


D. RESEARCH SUPPORT

K99/R00 NIH/NIHGS Pathway to Independence Award (GM147304)
Capturing the Holistic Glycocode through Systems Glycobiology 09/01/2022-present
1 K99 GM147304 K99 Postdoctoral Fellow 09/01/2022-present
Role: Principal Investigator

This proposal introduces novel technologies to capture glycoprotein features across the cell surface proteome, where glycan and protein components contribute holistically to unique molecular surfaces that relay biological information (i.e., the glycocode). Using these developments, we will generate a human glycocode atlas across multiple cell types to explore the role of glycocode heterogeneity in specialized cellular functions, and we will study dynamic glycocode reprogramming as cells transition from sedentary to migratory phenotypes known to drive numerous pathologies.

Completed Research Support:
F99/K00 (CA212454) NIH/NCI
Uniting Mass Spectrometry and Glycoscience to Investigate Cancer Biology 09/15/2016-08/31/2022
1 F99CA212454 F99 Graduate Fellow 09/15/2016-08/26/2018
4 K00CA212454 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.

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. RESEARCH PRESENTATIONS (ordered by most recent)

2023 Invited Talk, Translational Glycomics Symposium, Rising Stars in Glycoscience, Milwaukee, WI
2023 Award Lecture, 22nd Congress of the Human Proteome Organization, Busan, South Korea
2023 Invited Lunch Seminar, 22nd Congress of the Human Proteome Organization, Busan, South Korea
2023  **Conference Poster**, 22nd Congress of the Human Proteome Organization, Busan, South Korea
2023  **Invited Conference Talk**, 16th Uppsala Conference on ECD and ETD, Corvallis, OR
2023  **Conference Talk**, Cascadia Proteomics Symposium, Seattle, WA
2023  **Invited Lecture**, Thermo Fisher Scientific ASMS Users Meeting, Houston, TX
2023  **Conference Talk**, 71st ASMS Conference on Mass Spectrometry and Allied Topics, Houston, TX

*Prior to independent career: 43 Oral Presentations and 37 Poster Presentations*

**F. UNIVERSITY OF WASHINGTON TEACHING, LEADERSHIP, AND SERVICE ACTIVITIES**

**Riley Research Group Advisees/Mentees**

- **Graduate Students in Ph.D. Program (1):** Anna G. Duboff (summer 2023)
- **Postdocs (2):** Emmajay Sutherland (2023-present), Tim Veth (2023-present)

**Courses Taught**

- CHEM 321A, Quantitative Analysis, Winter 2024 (upcoming)
- CHEM 428/528A, Biomolecular Analyses, Spring 2024 (upcoming)

**Graduate Admissions Committee, UW Chemistry, 2023-present**

- Responsible for recruiting and admissions into the PhD program, and orientation of new graduate students.

**Research Infrastructure Committee, UW Chemistry, 2023-present**

- Responsible for reviewing and recommending changes to the department's research infrastructure: computing, shared instrumentation, staff support, etc.

**Graduate Committee Membership (outside of my group)**

- Addison E. Roush, UW Chemistry, Bush Group
- AnneClaire Wageman, UW Chemistry, Bush Group
- Christopher D. McGann, UW Genome Sciences, Schweppe Group

**Other Activities**

- 2023, Speaker at UW Chemistry Undergraduate Welcome Event

**G. EXTRAMURAL LEADERSHIP, MENTORING, AND SERVICE ACTIVITIES**

**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.

**Co-Chair, Human Glycoproteomics Initiative (HGI) Community-wide Study, HUPO, 2021-present**

- This second study focuses on teams of software developers only, with the goal to identify strengths and weaknesses of the very latest glycoproteomics software for glycopeptide identification and quantitation. As co-chair, I design experiments, coordinate with participants, analyze data, and work with the advisory committee to carry out this community wide study with 20 developer teams.

**ECR Mentor, US HUPO Early Career Researcher (ECR) Committee, 2023-present**

- Support the US HUPO ECR and its Executive Committee in all aspects of education, training, networking and activities being carried out by the ECR; attend monthly ECR executive committee meetings and other ECR-based meetings activities; represent the ECR’s interests at executive committee meetings and board meetings.

**ACS Division of Analytical Chemistry Education Committee, 2022-present**

- Administer Graduate Research Fellowships, Undergraduate Awards in Analytical Chemistry, and travel funding; plan regular opportunities for networking and teaching/learning through ACS national meetings and stand-alone virtual events; undertake special short-term and long-term projects related to analytical chemistry education.

**Activities:**

- *Speakers Bureau Initiative* (2023);
- *ChatGPT in Chemistry Discussion Panel* (2023);
- I. M. Kolthoff Undergraduate Award (2023).
Assistant Program Chair, Pacific Northwest Mass Spectrometry Discussion Group (PacMass), 2023-present
Administer Graduate Research Fellowships, Undergraduate Awards in Analytical Chemistry, and travel funding; plan regular opportunities for networking and teaching/learning through ACS national meetings and stand-alone virtual events; undertake special short-term and long-term projects related to analytical chemistry education.

Poster Session Judge
2023, Human Proteome Organization, Early Career Researcher Poster Competition
2022, ASMS Annual Conference, Undergraduate Poster Session
2020, ASMS Annual Conference, Undergraduate Poster Session
2019, ASMS Annual Conference, Undergraduate Poster Session

Conference Events and Related Activities
- **Co-Chair**, Glycobiology Gordon Research Seminar, 2023-2025
- Discussion Leader, Glycobiology Gordon Research Seminar, Ventura, CA, March 2023
- **Organizer**, HGI Workshop on Glycoproteomics and Glycoinformatics, US HUPO, Chicago, IL, March 2023
- 2023 ASMS Abstract Program Review Committee

Postdoctoral Leadership and Service Experience: Stanford Science Penpals; Stanford ADVANCE Summer Institute Mentor; Stanford Summer Research Program (SSRP) - Amgen Scholars Program; Stanford Omics Mass Spectrometry Group

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

**H. EXTRAMURAL AND PRIOR TEACHING EXPERIENCE**

**Instructor**, North American Mass Spectrometry Summer School, 2023
Presented a lecture, participated in training events, and served on a panel for a three-day in-person course that provides training from world-leading experts in mass spectrometry and scientific and professional development.

**Instructor**, Skyline Online Course, Introduction to Targeted Proteomics: SRM/MRM and PRM, 2021-present
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. Sessions taught: April 2021, April 2022, October 2022.

**Lecturer**, BIOS 227, Mass Spectrometry & Proteomics: Opening the Black Box, Stanford Univ., Winter 2021, 2023
Developed and presented lectures on post-translational modifications and the combination of glycobiology and mass spectrometry at the invitation of course instructors Prof. Sharon Pitteri and Prof. Parag Mallick.

**Lecturer**, Stanford University Mass Spectrometry Seminar Series, Fall 2020
Designed and presented two lectures on fundamentals and cutting-edge research in glycoproteomics. These are recorded and used by many as introductions to the field.

*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 and Undergraduate Experience**: Graduate Lecturer for Biochemistry 660 at UW-Madison (3 semesters); Guest Lecturer for The Data Revolution in Science and Medicine at UW-Madison; Graduate Facilitator for Food, Fasting, and Fitness at UW-Madison; Teaching Assistant for CHEM 104 and 329 at UW-Madison; Peer Leader and Peer Leader Captain for University 101 at the University of South Carolina; Tutor and Mentor through the Waverly After School Program at the University of South Carolina.
I. PEER-REVIEW PARTICIPATION

<table>
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<tr>
<th>Publisher (Example Journals)</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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<tr>
<td>American Chemical Society (An. Chem., JPR, JASMS)</td>
<td>3</td>
<td>3</td>
<td>5</td>
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<td>Other (Mol. &amp; Cell. Proteomics, Molecular Omics, JCB)</td>
<td>2</td>
<td>2</td>
<td>3</td>
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<td><strong>Total</strong></td>
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<td><strong>5</strong></td>
<td><strong>10</strong></td>
<td><strong>14</strong></td>
<td><strong>12</strong></td>
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</tbody>
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J. PROFESSIONAL SOCIETIES AND AFFILIATIONS

American Society for Mass Spectrometry, 2013-present
American Chemical Society, 2013-present
Human Proteome Organization, 2022-present (US HUPO 2015-present)
Society for Glycobiology, 2017-present
American Society for Biochemistry and Molecular Biology, 2020-present
American Association for Cancer Research, Associate Member, 2020-present
Tegmine Therapeutics, Inc., Scientific Advisor, 2020-present
Cartography Biosciences, Scientific Consultant, 2023-present
Augment Biologics, Scientific Consultant, 2023-present

K. HONORS AND AWARDS FULL LIST

**Independent Career**

2023  
HUPO Rising Star Award
Rising Star in Glycoscience, Translational Glycomics Center
Young Honors Alumni Award, South Carolina Honors College

**Postdoctoral**

2022 – 2023  
NIH Pathway to Independence Award (K99/R00)

2018 – 2022  
NIH National Cancer Institute K00 Postdoctoral Fellow (K00CA212454)

2022  
HUPO World Congress Travel Award (combined award from HUPO and US HUPO)

2022  
24th International Mass Spectrometry Conference Young Mass Spectrometrist Keynote Lecture

2021  
Rising Star in Proteomics and Metabolomics, Journal of Proteome Research

2021  
ASBMB Postdoctoral Researcher Award

2021  
US HUPO Postdoctoral Award Honorable Mention

2021  
Society for Glycobiology Travel Award

2020  
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
<table>
<thead>
<tr>
<th>Year</th>
<th>Award Description</th>
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<tbody>
<tr>
<td>2012</td>
<td>Pei Wang Graduate Fellowship, Department of Chemistry, UW-Madison</td>
</tr>
<tr>
<td>2012</td>
<td>Louise McBee Graduate Fellowship, Alpha Lambda Delta Honors Society</td>
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**Undergraduate**

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