LISA M. RYNO

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Experience

Oberlin College Oberlin, OH
Associate Professor of Chemistry and Biochemistry — July 2021 – present
Assistant Professor of Chemistry and Biochemistry — July 2014 – July 2021

The University of San Diego San Diego, CA
Postdoctoral Research Associate, Adviser: Prof. Peter Iovine — Jan. 2013 – June 2014
Adjunct Assistant Professor

Education

The Scripps Research Institute La Jolla, CA — 2008 – 2012
Ph.D., Chemical Biology, Adviser: Prof. Jeffery Kelly,
"Adapting Proteostasis Through Stress-Responsive Signaling"

Trinity University San Antonio, TX — 2004 – 2008
B.S. Chemistry, Research Adviser: Prof. Adam Urbach

Publications

‡ Indicates Oberlin undergraduate co-author

(17) Hantus, C.E.‡, Moppel, I.J.‡, Frizzell, J.K.‡, Francis, A.K.‡, Nagashima, K.‡, **Ryno, L.M.** L-Rhamnose Globally Changes the Transcriptome of Planktonic and Biofilm Escherichia coli Cells and Modulates Biofilm Growth. *Microorganisms* **2024**, *12*, 1911.

(16) Frizzell, J.K. ‡, Taylor, R.L.‡, **Ryno, L.M**. Constitutive Activation of RpoH and the Addition of L-arabinose Influence Antibiotic Sensitivity of PHL628 *E. coli*. *Antibiotics,* **2024**, *13*(2), 143.

(15) Buck, L.D. ‡, Paladino, M.M.‡, Nagashima, K.‡, Holtzman, J.S. ‡, Brezel, E.R. ‡, Urso, S.J. ‡, **Ryno, L.M.** Temperature-dependent influence of FliA overexpression on PHL628 *E. coli* biofilm growth and composition. *Frontiers in Cellular and Infection Microbiology,* **2021***,* 11*,* 775270*.*

(14) Bell, E.W.‡; Zheng, E.J.‡; **Ryno, L.M.** Identification of inhibitors of the *E. coli* chaperone SurA using *in silico* and *in vitro* techniques. *Bioorganic and Medicinal Chemistry Letters*, **2018**, 28(22), 3540-3548.

(13) **Ryno, L.M.**; Cottine, C. The biological impact and ethical implications of pesticide use: a short module for upper-division undergraduate biochemistry courses. *Journal of Chemical Education*, **2018**, 95 (10), 1771-1777.

(12) Genereux, J.C.; Qu, S.; Zhou, M.; **Ryno, L.M.**; Wang, S.; Shoulders, M.D.; Kaufman, R.J.; Lasmezas, C.I.; Kelly, J.W.; Wiseman, R.L. Unfolded protein response-induced ERdj3 secretion links ER stress to extracellular proteostasis. *EMBOJ*, **2015**, 34(1), 4-19.

(11) Cooley, C.B.***; Ryno, L.M.***; Morgan, G.F.; Hulleman, J.D.; Kelly, J.W.; Wiseman, R.L. Activating the ATF6 Arm of the UPR Decreases the Secretion of Amyloidogenic Immunoglobulin Light Chain. *Proceedings of the National Academy of Sciences.* **2014,** 111(36), 13046-13051.
***equal authorship**

(10) **Ryno, L.M.**; Reese, C.; Tolan, M.; O'Brien, J.; Short, G.; Sorriano, G.; Nettleton, J.; Fulton, K.; Iovine, P.M. Amphiphilic Graft Copolymers from End-Functionalized Starches: Synthesis, Characterization, Thin Film Preparation and Small Molecule Loading. *Biomacromolecules.* **2014**, 15 (8), pp 2944–2951.

(9) Wang, X.; Cattaneo, F.; **Ryno, L.M.**; Hulleman, J.D.; Reixach, N.; Buxbaum, J.N. The Systemic Amyloid Precursor Transthyretin (TTR) Behaves as A Neuronal Stress protein regulated by HSF1 in SH- SY5Y human neuroblastoma cells and APP23 Alzheimer's disease Model Mice. *Journal of Neuroscience.* **2014**, 34(21), 7253–7265.

(8) **Ryno, L.M.**; Genereux, J.C.; Naito, T.; Morimoto, R.I.; Powers, E.T.; Shoulders, M.D.; Wiseman, R.L. Characterizing the Altered Cellular Proteome Induced by the Stress-Independent Activation of Heat Shock Factor 1. *ACS Chemical Biology.* **2014**, 9(6), 1273–1283.

(7) **Ryno, L.M.**; Levine, Y.; Iovine, P.M. Synthesis and Characterization of Amylose-Guest Complexes Prepared by Microwave Irradiation. *Carbohydrate Research.* **2014**, 383, 82-8.

(6) Shoulders, M.D.*****; **Ryno, L.M.***; Kelly J.W.; Wiseman, R.L. Broadly Applicable Methodology for the Dosable, Rapid, and Small Molecule-Mediated Regulation of Transcription Factors in Human Cells. *Journal of the American Chemical Society.* **2013**, 135(22), 8129–32.
***equal authorship**

(5) **Ryno, L.M.;** Wiseman, R. L.; Kelly, J.W. Targeting Unfolded Protein Response Signaling Pathways to Ameliorate Protein Misfolding Diseases. *Current Opinions in Chemical Biology,* **2013**, 17, 346-352.

(4) Shoulders, M.D.; **Ryno, L.M.**; Genereux, J.C.; Moresco, J.J.; Tu, P.G.; Yates, J.R.; Su, A.I.; Kelly J.W.; Wiseman, R.L. Stress Independent Activation of XBP1s and/or ATF6 Reveals Three Functionally Diverse ER Proteostasis Environments. *Cell Reports,* **2013**, 3(4), 1279-92.

(3) Ramalingam, V.; Kwee, S.K.; **Ryno, L.M.**; Urbach, A.R. A cucurbit[8]uril sponge. *Organic and Biomolecular Chemistry*, **2012**, 10(43), 8587-9.

(2) Chinai, J.M.; Taylor, A.B.; **Ryno, L.M.**; Hargreaves, N.D.; Morris, C; Hart, P.J., Urbach, A.R. Molecular Recognition of Insulin by a Synthetic Receptor. *Journal of the American Chemical Society*; **2011**, 133(23), 8810-8813.

(1) **Heitmann, L. M**.; Taylor, A. B.; Hart, P. J.; Urbach, A. R. Sequence specific recognition and cooperative dimerization of N-terminal aromatic peptides by a synthetic host. *Journal of the American Chemical Society*; **2006**, 128(38), 12574-12581.

Work in Progress

‡ Indicates Oberlin undergraduate co-author

Austin, K.‡; Frizzell, J.K.‡; Neighmond, A.‡; Ryno, L.M. Arabinose alters the *E. coli* transcriptome to favor biofilm growth and enhances survival with fluoroquinolone stress. *Manuscript in preparation: to be submitted May 2025.*

Grants and Fellowships

National Science Foundation Research at Undergraduate Institutions Award: "RUI: Sugar-mediated remodeling of the *E. coli* transcriptome and its impact on biofilm growth and composition." 08/01/2022, $534,002 (MCB-2226953).

Research Corporation for Science Advancement (RCSA) Scialog Fellow. Microbiome, Neurobiology and Disease. Awarded January 2020. Travel and meeting expenses funded by the RCSA, the Paul G. Allen Frontiers Group and the Frederick Gardner Cottrell Foundation. Attended 2021 and 2022 symposia virtually.

National Science Foundation Major Research Instrumentation Award (Co-PI): "Acquisition of a Confocal Microscope for Student-Faculty Research and Research Training" 10/1/2018, $576,185 (CHE-1828041).

Research Corporation for Science Advancement Cottrell Scholar Award: "Investigating the impact of FliA overexpression on the formation and composition of *E. coli* biofilms at different temperatures." Received January 2018, $100,000.

National Science Foundation Major Research Instrumentation Award (Co-PI): "Acquisition of a Scanning Electron Microscope with integrated EDS, WDS, and EBSD for research and undergraduate research training" Awarded 6/6/2016, $332,105 (CHE-1626271)

Seminars and Presentations

‡ Indicates Oberlin undergraduate, presenter is underlined

"The role of environmental sugars in modulating *E. coli* biofilm formation and antibiotic resistance." American Chemical Society National Meeting, Biological Chemistry Division, March 23, 2025, San Diego, CA (Oral).

"Using intra- and extracellular leverage points in *E. coli* to influence biofilm growth, composition, and antibiotic tolerance." Denison Chemistry and Biochemistry Department invited seminar. Granville, OH. September 19, 2023.

"Using intra- and extracellular leverage points in *E. coli* to influence biofilm growth, composition, and antibiotic tolerance." Oberlin Chemistry and Biochemistry Department Seminar. Oberlin, OH. September 21, 2022.

"The Impact of Undergraduate Research: A Personal Vignette." Trinity University 2021 Summer Research & Internship Symposium invited keynote address, virtual. July 28, 2021.

"Searching for new antibiotics: chaperones and stress-responsive signaling pathways as targets for antibiotic development." Invited seminar, Cleveland State University Chemistry Department, Cleveland, OH. January 31, 2020.

"Sabbatical Tales: Inhibiting Chaperones, Stressing Out Bacteria, and Detecting Antibiotics." Oberlin Chemistry and Biochemistry Department Seminar. Oberlin, OH. December 11, 2019.

"The biological impact and ethical implications of pesticide use: a short module for upper-division undergraduate biochemistry courses," oral presentation at the 25th Biennial Conference on Chemical Education, July 29 – August 1, 2018, South Bend, IN.

"Improving retention of underrepresented minority students in STEM through near-peer mentoring," oral presentation at the annual Cottrell Scholar Conference, July 12, 2018, Tucson, AZ.

"Investigating the impact of FliA overexpression on the formation and composition of *E. coli* biofilms at different temperatures," Cottrell Scholar Conference, July 11 – 13, 2018, Tucson, AZ. (Poster)

"Discovering inhibitors of the chaperone SurA using *in silico* and *in vitro* techniques," invited seminar in the Department of Chemistry at the University of Akron, December 5, 2017.

Sarel J. Loewus‡, Emma R. Brezel‡, Erica J. Zheng‡, Lisa M. Ryno. "Targeting stress-responsive and sigma factor-controlled signaling pathways to modulate biofilm growth and composition." American Society of Biochemistry and Molecular Biology National Meeting at the Experimental Biology Conference, Antibacterial Targets and Drug Discovery Division, April 2017, Chicago, IL. (Poster)

Sarel J. Loewus‡, Emma R. Brezel‡, Erica J. Zheng‡, Lisa M. Ryno. "Targeting stress-responsive and sigma factor-controlled signaling pathways to modulate biofilm growth and composition." Gordon Research Conference: Microbial Stress Responses, July 2016. (Poster)

"Protein homeostasis and prokaryotes: investigating unexplored signaling pathways and chaperones for the development of bactericidal agents." Science Friday Seminar Series, Oberlin College. October 16, 2015

"Protein Homeostasis, Polymers and Prokaryotes" invited seminar at John Carroll University, October 29, 2014.

Off-Campus Student Presentations:

Justin Bader‡, Isabella J. Moppel‡, Lisa M. Ryno. "Extracellular polymeric substance analysis of *E. coli* biofilm exposed to D-ribose." American Chemical Society National Meeting, Biological Chemistry Division, March 25, 2025, San Diego, CA (Poster).

Koosh Nadkarni‡, Charlotte E. Hantus‡, and Lisa M. Ryno."Impact of D-sorbitol on the expression of biofilm-related genes in PHL628 and Nissle1917 *E. coli.*" American Chemical Society National Meeting, Biological Chemistry Division, March 25, 2025, San Diego, CA (Poster).

Audrey Neighmond‡, Katie M. Austin‡, Lisa M. Ryno. "L-arabinose influence on internal and external pH of PHL628 *E. coli.*" American Chemical Society National Meeting, Biological Chemistry Division, March 25, 2025, San Diego, CA (Poster).

Katie M. Austin‡, Isabella J. Moppel‡, Lisa M. Ryno. "Transcriptomic analysis of L-arabinose treatment on *E. coli* biofilm and planktonic cells. American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, March 2024, San Antonio, TX (Poster).

Jenna K. Frizzell‡, Ryan L. Taylor‡, Lisa M. Ryno. "Integrated effect of L-arabinose and stress-responsive signaling on *E. coli* antibiotic sensitivity. American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, March 2024, San Antonio, TX (Poster).

Charlotte E. Hantus‡, Kyogo Nagashima‡, and Lisa M. Ryno. "Effects of L-rhamnose on the production and composition of *E. coli* biofilm." American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, March 2024, San Antonio, TX (Poster).

Guadalupe Marino Garcia‡, Kyogo Nagashima‡, and Lisa M. Ryno. "Understanding the role of galactose and glucose on the composition of E. coli extracellular polymeric substance and biofilm growth." American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, March 2024, San Antonio, TX (Poster).

Isabella Moppel[‡], Anna Francis[‡], Jason Kuchtey[‡], and Lisa M. Ryno. "Examining the effect of L-rhamnose metabolism on the transcriptome of *Escherichia coli*." American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, March 2024, San Antonio, TX (Poster).

Anna Francis[‡], Kyogo Nagashima[‡], Lisa M. Ryno. "Transcriptomic analysis of rhamnose treatment on *E. coli* planktonic and biofilm cells" American Chemical Society National Meeting, Biological Chemistry Division, March 2023, Indianapolis, IN (Poster).

Jenna K. Frizzell[‡], Ryan L. Taylor[‡], Yuan Tian[‡], Lisa M. Ryno. "Influence of RpoH and RpoF overexpression on quinolone, macrolide, and glycopeptide antibiotic tolerance and biofilm growth in *E. coli*" American Chemical Society National Meeting, Biological Chemistry Division, March 2023, Indianapolis, IN (Poster).

Yeongseo (Ellie) Ko[‡], Kyogo Nagashima[‡], Charlotte L. Andrews[‡], Eunice K. Kim[‡], Lisa M. Ryno. "Influence of overexpression of the phosphodiesterase YhjH on *E. coli* biofilm formation and composition" American Chemical Society National Meeting, Biological Chemistry Division, March 2023, Indianapolis, IN (Poster).

Allison B. Lupatkin[‡], Ryan L. Taylor[‡], Lisa M. Ryno. "Development of whole-cell sensors for low concentration antibiotic detection" American Chemical Society National Meeting, Biological Chemistry Division, March 2023, Indianapolis, IN (Poster).

Kyogo Nagashima[‡] and Lisa M. Ryno. "Exploring the Influence of Environmental Lactose on Biofilm Formation and Composition in *E. coli*" American Chemical Society National Meeting, Biological Chemistry Division, March 2023, Indianapolis, IN (Poster).

Ryan L. Taylor[‡], Yuan Tian, Lisa M. Ryno. "Changes in Tolerance of Amphenicol and Tetracycline Antibiotics with Stress-Responsive Transcription Factor Overexpression in *E. coli*" American Chemical Society National Meeting, Biological Chemistry Division, March 2023, Indianapolis, IN (Poster).

Luke D. Buck[‡], Sarel J. Loewus[‡], Lisa M. Ryno. "Quantifying the Influence of RpoF Overexpression on Extracellular Biomolecules in PHL628 *E. coli* Biofilms by Confocal Microscopy" American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, April 2021 (Poster, virtual)

Eunice Y. Kim[‡], Charlotte L. Andrews[‡], Lisa M. Ryno. "Understanding the Role of YhjH Phosphodiesterase on Biofilm Formation in *E. coli*" American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, April 2021 (Poster, virtual)

Madison M. Paladino[‡], Emma R. Brezel[‡], Joshua S. Holtzman[‡], Lisa M. Ryno. "Temperature-dependent Influence of RpoF Overexpression on the *E. coli* Extracellular Proteome" American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, April 2021 (Poster, virtual)

Erica J. Zheng[‡], Eric W. Bell[‡], Lisa M. Ryno. "Exploring inhibitors of the periplasmic chaperone SurA using fluorescence anisotropy." American Society of Biochemistry and Molecular Biology National Meeting, Antibacterial Targets and Drug Discovery Division, April 2017, Chicago, IL. (Poster)

Eric W. Bell[‡], Lisa M. Ryno. "Insights into the binding behavior of chaperone SurA using *in silico* methods." 251st American Chemical Society National Meeting, Chemical Education Division, March 2016, San Diego, CA (Poster).

Sarel J. Loewus[‡], Emily M. Curley[‡], Lisa M. Ryno. "Stress-responsive signaling pathways as targets for modulating biofilm growth." 251st American Chemical Society National Meeting, Biological Chemistry

Division, March 2016, San Diego, CA (Poster).

Undergraduate Research Students Mentored

Charlotte Andrews, Oberlin College ’19
Katie Austin, Oberlin College ’24
Justin Bader, Oberlin College ’25
Eric Bell, Oberlin College ’17, Honors Student
Emma Brezel, Oberlin College ’17
Luke Buck, Oberlin College ’21, Honors Student
Peter Choi, Oberlin College ’23
Emily Curley, Oberlin College ’17
Dorothy DeBiasse, Oberlin College ’19
Daniel Etcheberrigaray, Oberlin College ’25, Honors Student
Molly Foley, Oberlin College ’26
Anna Francis, Oberlin College ’23
Jenna Frizzell, Oberlin College ’23, Honors Student
Aditi Gupta, Oberlin College ’17
Charlotte Hantus, Oberlin College ’25
Joshua Holtzman, Oberlin College ’21
Sarah Hughes, Oberlin College ’18
Dylan Hwang, Oberlin College ’26
Katie Johnstone, Oberlin College ’26
Eunice Kim, Oberlin College ’21, Honors Student
Jason Kuchtey, Oberlin College ’25
Yeongseo (Ellie) Ko, Oberlin College ’25
Sarel Loewus, Oberlin College ’16, Honors Student
Allison Lupatkin, Oberlin College ‘24
Guadalupe Marino Garcia, Oberlin College ’26
Isabella Moppel, Oberlin College ’25, Honors Student
Koosh Nadkarni, Oberlin College ’27
Kyogo Nagashima, Oberlin College ’24
Maddison Paladino, Oberlin College ’21
Christian Pfennig, Oberlin College ’24
Yasmine Ramachandra, Oberlin College ’19
Helen Sarrimanolis, Oberlin College ’24
Delia Scoville, Oberlin College ’16
Ryan Taylor, Oberlin College ’23
JoAnn Tinker, Oberlin College ’20
Yuan Tian, Oberlin College ’21
Gabrielle Walsh, Oberlin College ’18
Erica Zheng, Oberlin College ’17, Honors Student

Service

National

Manuscript Reviewer for *ACS Infectious Diseases*, 2020 – present
Manuscript Reviewer for *Bioorganic and Medicinal Chemistry Letters*, 2019 – present
Manuscript Reviewer for *Frontiers in Cell and Developmental Biology*, 2022 – present
Manuscript Reviewer for *Frontiers in Chemical Biology*, 2023 – present
Manuscript Reviewer for *Journal of Chemical Education*, 2019 – present
Manuscript Reviewer for *Organic Chemistry Letters*, 2019 – present

Manuscript Reviewer for *Pathogens*, 2024 – present
Manuscript Reviewer for *Pharmaceutics*, 2024 – present
Manuscript Reviewer for *ncRNA*, 2024 – present
Contributor for Council for Undergraduate Research (CUR) blog, 2019
Annual Biomedical Research Conference for Minority Students (ABRCMS) abstract and travel award reviewer. 2016 – present.

Oberlin College
Tenure Track Peer Mentor (Spring 2023 – present)
General Faculty Council (Spring 2023 – July 2023)
Amanda Schmidt (Geology) Promotion to Full Committee, Spring 2023
Sara Verosky (Psychology) Tenure Committee Inside-Outsider, Fall 2022
Off-Campus Study (Study Away COM-OCS) Fall 2022 – Spring 2023
Institutional Animal Care and Use Committee (Fall 2015 – Spring 2017, Fall 2020 – Spring 2021)
Health Careers Committee (Fall 2015– Spring 2017, Fall 2022 – present)
General Faculty Committee on Equity Diversity and Inclusion (Fall 2020 – Spring 2021)
General Faculty Committee on Undergraduate Research (Fall 2020 – Spring 2021)
Individual Major Committee (Fall 2015 – Spring 2017)
Sigma Xi Membership Committee (Spring 2016)
Science Friday Coordinator (Spring 2016 - Fall 2016)
Biology Honors Committee Member, Ezra Taub OC ’25
Neuroscience Honors Committee Member, Shawn Ho OC ’24
Biology Honors Committee Member, Roger Ort OC ’21
Biology Honors Committee Member, Roberto Ramos OC ’21
Biology Honors Committee Member, Lisa-Qiao MacDonald OC ’16
Neuroscience Honors Committee Member, Weelic Chong OC ’15

Other Scholarships/Awards

Oberlin College Excellence in Teaching Award (2023)
NSF Graduate Research Fellowship Honorable Mention (2008, 2009)
William McGavock Award Recipient for Excellence in Undergraduate Research (2008)
Barry M. Goldwater Scholarship (2007)
Jean Dreyfus Boissevain Undergraduate Scholarship for Excellence in Chemistry (2007)
Frank and Sarah McKnight Prize in Undergraduate Chemistry Finalist (2007)

Professional Associations

American Chemical Society (2010–present)
American Society for Biochemistry and Molecular Biology (2014–present)
Sigma Xi (2015–2023)