Andrew A. Bridges
Assistant Professor
Carnegie Mellon University – Department of Biological Sciences
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EDUCATION:

2011-2017 **Doctor of Philosophy**
Department of Biological Sciences, Dartmouth, Hanover, NH.

2007-2011 **Bachelor of Science**
Department of Chemistry, Appalachian State University, Boone, NC.

TRAINING:

2017-2022 **Postdoctoral Fellow**
Department of Molecular Biology, Princeton University, NJ.
Howard Hughes Medical Institute
Advisor: Bonnie L. Bassler, Ph.D.
Research Interests: Signal transduction systems controlling the assembly and disassembly of bacterial biofilm communities

2011-2017 **Doctoral Thesis Research**
Department of Biological Sciences, Dartmouth, Hanover, NH.
Advisor: Amy S. Gladfelter, Ph.D.
(Presently at University of North Carolina)
Thesis project: Assembly dynamics of the septin cytoskeleton

2009-2011 **Undergraduate Thesis Research**
Department of Chemistry, Appalachian State University, Boone, NC.
Advisor: Jennifer P. Cecile, Ph.D.
Thesis project: Functional characterization of the *Caenorhabditis elegans* organic anion transporter

HONORS AND AWARDS:

2022 Blavatnik Regional Awards Finalist
2021-2026 NIH Pathway to Independence Award (K99/R00)
2021 Damon Runyon-Dale F. Frey Award for Breakthrough Scientists
2021 Annual Postdoctoral Award for Achieving Great Science, Department of Molecular Biology, Princeton University
2017-2021 HHMI Fellow of the Damon Runyon Cancer Research Foundation
2015-2016 John H. Copenhaver, Jr. and William H. Thomas, MD 1952 Fellowship, Department of Biological Sciences, Dartmouth College
2014 Albert J. Ryan Fellowship, Albert Ryan Foundation
2013-2015 Dartmouth Molecular and Cellular Biology Graduate Training Grant
2013 Dartmouth Graduate Studies Teaching Award
2011 Syngenta Award in the Field of Biochemistry, Appalachian State University
2010 Travel Award, Society for the Advancement of Chicanos and Native Americans in Science National Meeting
2010 National Science Foundation Research Experience for Undergraduates, Department of Biological Sciences, University of Texas El Paso
2010 AR Smith Chemistry Departmental Scholarship, Department of Chemistry, Appalachian State University

PUBLICATIONS:

20. Prentice, J.A., van de Weerd, R., **Bridges, A. A.** (2024) Cell-lysis sensing drives biofilm formation in *Vibrio cholerae. Nat Commun 15, 2018.*
19. **Bridges, A. A.** (2023) mSphere of Influence: The complex world of bacterial biogeography. *mSphere* **e00628-23**.
18. Prentice, J.A., **Bridges, A. A.**, Bassler, B. L. (2022) Synergy between c-di-GMP and Quorum-Sensing Signaling in Vibrio cholerae Biofilm Morphogenesis. *Journal of Bacteriology* **e00249-22**.
17. **Bridges, A. A.**, Prentice, J.A., Wingreen, N.S., Bassler, B. L. (2022) Signal Transduction Network Principles Underlying Bacterial Collective Behaviors. *Annual Review of Microbiology* **76***.*
16. **Bridges, A. A.***, Prentice, J.A.*, Fei, C., Wingreen, N.S., Bassler, B. L. (2022) Quantitative input-output dynamics of a c-di-GMP signal-transduction cascade in *Vibrio cholerae. PLoS Biology* **20 (3)**.
    *These authors contributed equally.
15. **Bridges, A. A.** and Bassler, B. L. (2021) Inverse regulation of *Vibrio cholerae* biofilm dispersal by polyamine signals. *eLife* **10**, e65487.
14. **Bridges, A. A.**, Fei, C., Bassler, B. L. (2020) Identification of signaling pathways, matrix-digestion enzymes, and motility components controlling *Vibrio cholerae* biofilm dispersal. *Proceedings of the National Academy of Sciences of the United States of America* **117 (51)**, 32639-32647.
13. Qin, B., Fei, C., **Bridges, A. A.,** Mashruwala, A., Stone, H., Wingreen, N. S., Bassler, B. L. (2020) Cell fates and collective fountain flow in bacterial biofilms revealed by light-sheet microscopy. *Science* **369**, 71-77.
    -Recommended by Faculty Opinions
12. Silpe, J. E.*, **Bridges, A. A***., Huang X., Coronado D. R., Duddy O. P., Bassler B. L. (2020) Separating functions of the phage-encoded quorum-sensing-activated antirepressor Qtip. *Cell Host & Microbe* **27**, 629–641.
    *These authors contributed equally.
11. **Bridges, A. A.** and Bassler, B. L. (2019) The intra-genus and inter-species quorum-sensing autoinducers exert distinct control over *Vibrio cholerae* biofilm formation and dispersal. *PLoS Biology* **17,** 11.
    -Recommended by F1000 prime faculty
10. **Bridges, A. A.**, and Gladfelter, A. S. (2016) Septin complexes assemble during a kinetic window of opportunity. *Cell cycle* **11**, 1-2.
9. **Bridges, A. A.,** and Gladfelter, A. S. (2016) In vitro reconstitution of septin assemblies on supported lipid bilayers. *Methods in Cell Biology* **136,** 57-71.
8. **Bridges, A. A.,** Jentzsch, M. S., Occhipinti, P. Oakes, P.W., Gladfelter, A. S. (2016) Micron-scale plasma membrane curvature is recognized by the septin cytoskeleton. *Journal of Cell Biology* **213**, 23-32.
    -Recommended by F1000 prime faculty
7. Zhang, H., Elbaum-Garfinkle, S., Langdon, E.M., Taylor, N., Occhipinti, P., **Bridges, A. A.**, Brangwynne, C. P., Gladfelter, A. S. (2015) RNA controls polyQ protein phase transitions. *Molecular Cell* **60**, 220-230.
    -Recommended by F1000 prime faculty
6. **Bridges, A. A.**, and Gladfelter, A. S. (2015) Septin form and function at the cell cortex. *The Journal of Biological Chemistry* **290,** 17173-17180.
5. Kaplan, C., Jing, B., Winterflood, C. M., **Bridges, A. A.**, Occhipinti, P., Schmied, J., Grinhagens, S., Gronemeyer, T., Tinnefeld, P., Gladfelter, A. S., Ries, J., and Ewers, H. (2015) Absolute arrangement of subunits in cytoskeletal septin filaments in cells Measured by fluorescence microscopy. *Nano Letters* 15, 3859-3864.

4. **Bridges, A. A.**, and Gladfelter, A. S. (2014) Fungal pathogens are platforms for discovering novel and conserved septin properties. *Current Opinion in Microbiology* **20**, 42-48.
3. Bahl, C. D., Hvorecny, K. L., **Bridges, A. A.**, Ballok, A. E., Bomberger, J. M., Cady, K. C., O'Toole, G. A., and Madden, D. R. (2014) Signature motifs identify an Acinetobacter Cif virulence factor with epoxide hydrolase activity. *The Journal of Biological Chemistry* **289**, 7460-7469.
2. **Bridges, A. A.**, Zhang, H., Mehta, S. B., Occhipinti, P., Tani, T., and Gladfelter, A. S. (2014) Septin assemblies form by diffusion-driven annealing on membranes. *Proceedings of the National Academy of Sciences of the United States of America* **111**, 2146-2151.
1. Sellin Jeffries, M. K., Conoan, N. H., Cox, M. B., Sangster, J. L., Balsiger, H. A., **Bridges, A. A.**, Cowman, T., Knight, L. A., Bartelt-Hunt, S. L., and Kolok, A. S. (2011) The anti-estrogenic activity of sediments from agriculturally intense watersheds: assessment using in vivo and in vitro assays. *Aquatic Toxicology* **105**, 189-198.

INVITED PRESENTATIONS:

2024 Identifying the Future of Microbial Molecular Biology and Physiology Seminar Series – Hosted by the American Society for Microbiology
Oral Presentation: *Using Automation to Uncover and Manipulate Bacterial Behaviors*

2023 Molecular Genetics of Phages and Bacteria Meeting, Madison, WI
Oral Presentation: *Vibrio cholerae gauges "kin" cell lysis using polyamine signals*

2023 3rd Nobel Turing Challenge Initiative Workshop, Carnegie Mellon University
Oral Presentation: *Unleashing the power of automation to uncover and manipulate bacterial behaviors*

2023 Tufts University Department of Molecular Biology and Microbiology
Oral Presentation: *Vibrio cholerae gauges "kin" cell lysis using polyamine signals*

2022 Florida Institute of Technology Seminar Series in Biological Sciences
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 University of Wisconsin Department of Bacteriology
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 UCSF Department of Microbiology and Immunology
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 Emory University Department of Microbiology and Immunology
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 Dartmouth Geisel School of Medicine Department of Biochemistry and Cell Bio
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 National Institutes of Health NIDDK
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 Carnegie Mellon University Department of Biological Sciences
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2022 University of Georgia Department of Genetics
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2021 ASM/FEMS World Microbe Forum 2021
Oral Presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2021 ASM DC Branch Virtual Spring Meeting 2021
Oral presentation: *This way out: Regulation of V. cholerae biofilm dispersal*

2020 Lambda Lunch Special Interest Group, National Institutes of Health
Oral presentation: *Identification and analysis of the signaling pathways, matrix digestion enzymes, and motility components controlling Vibrio cholerae biofilm dispersal*

2020	Department of Molecular Biology Retreat, Princeton University Oral presentation: *Identification and analysis of the signaling pathways, matrix digestion enzymes, and motility components controlling Vibrio cholerae biofilm dispersal*
2020	New Voices in Infection Biology, Max Planck Institute for Infection Biology, Berlin Oral presentation: *Identification and analysis of the signaling pathways, matrix digestion enzymes, and motility components controlling Vibrio cholerae biofilm dispersal*
2019	Molecular Biology of Prokaryotes Seminar Series, Princeton University Oral presentation: *Quorum sensing control over Vibrio cholerae biofilm formation and dispersal*
2019	Damon Runyon Fellows' Meeting, Southbridge, MA Oral presentation: *Quorum sensing control over Vibrio cholerae biofilm formation and dispersal*
2019	Applied and Environmental Microbiology GRC, South Hadley, MA Poster presentation: *Autoinducer-2 controls biofilm formation in Vibrio cholerae*
2018	Molecular Genetics of Bacteria and Phages Meeting, Madison, WI Poster presentation: *Self- and universal-quorum-sensing autoinducers regulate distinct phases of the Vibrio cholerae biofilm lifecycle*
2016	Plant and Microbial Cytoskeleton Gordon Research Conference, Proctor Academy, NH Oral presentation: *Micron-scale plasma membrane curvature is recognized by the septin cytoskeleton*
2015	American Society for Cell Biology Annual Meeting, San Diego, CA Poster presentation: *Micron-scale plasma membrane curvature is recognized by the septin cytoskeleton*
2015	Biophysics of Surfaces Meeting, Madrid, Spain Poster presentation*: Septins recognize micron-scale plasma membrane curvature*
2014	Albert J. Ryan Fellows Retreat, Littleton, NH Oral presentation: *Septins recognize micron-scale plasma membrane curvature*
2014	American Society for Cell Biology Annual Meeting, Philadelphia, PA Oral ePoster and poster presentation: *Septins recognize micron-scale plasma membrane curvature*
2013	American Society for Cell Biology Annual Meeting, New Orleans, LA Oral minisymposium presentation: *Septin assemblies form by diffusion-driven annealing on membranes*
2012	Swiss Single Molecule Localization Microscopy, Lausanne, Switzerland. Poster presentation: *Polarized TIRF microscopy for observation of septin dynamics*
2010	Society for the Advancement of Native Americans and Chicanos in Science National Meeting, Anaheim, CA. Poster presentation: *Targeting hormone receptors for prostate cancer* *Undergraduate poster presentation award

RESEARCH SUPPORT:

Curci123 (Bridges) PI 2024-2026
Shurl and Kay Curci Foundation Research Grant
Defining bacterial cell fates with fluorogenic probes

KA2023-136488 (Bridges) PI 2023-2025
Kaufman Foundation New Investigator Research Grant
Exploring the inter-species interactions controlling bacterial biofilm formation

1K99AI158939-01 (Bridges) PI 2021-2025
NIH NIAID Pathway to Independence Award (K99/R00)
This way out: Spatiotemporal regulation of Vibrio cholerae biofilm dispersal

2302-17 (Bridges) PI 2022-2023
Dale F. Frey Award for Breakthrough Scientists- Damon Runyon Cancer Research Foundation
Bacterial cell fates: The role of quorum sensing in biofilm patterning

2302-17 (Bridges) PI 2017-2021
HHMI Fellowship of the Damon Runyon Cancer Research Foundation
Bacterial cell fates: The role of quorum sensing in biofilm patterning

TEACHING AND MENTORSHIP EXPERIENCE:

2024	Advanced Genetics, Carnegie Mellon University
2023	Department of Biological Sciences Summer Research Institute Mentor, Carnegie Mellon University
2022-Present	Leader of Research Focus Groups, Department of Biological Sciences, Carnegie Mellon University
2013-Present	Research Mentor to Graduate and Undergraduate Students
2018-2020	Head Teaching Assistant, Biochemistry, Princeton University
2013	Teaching Assistantship, Cell Biology, Dartmouth College
2009-2011	Supplemental Instructor, Organic Chemistry, Appalachian State

SERVICE:

2024	Member, CMU Biology Diversity and Inclusion Committee
2024	Member, CMU Biology Trainee Awards Committee
2023	Member, CMU Biology Graduate Students Admissions Committee
2020-2022	Member, Princeton Molecular Biology Diversity and Inclusion Committee
2013-2014	Member, Dartmouth Mol and Cell Biology Graduate Program Committee
2010	President, Appalachian Chemical Society, Appalachian State

OUTREACH:

2023	Sigma Xi Honor Society Poster Competition Judge, Carnegie Mellon
2021-2022	Authentic Science Research Program Mentor
2020-2022	Skype a Scientist
2019	NJ Wild Expo Biology Demonstration, Jackson Township, NJ
2017	Hopewell Elementary School Science Fair Poster Judge, Hopewell, NJ
2017	Antheil Elementary Hands-on Science Night, Ewing, NJ
2017- 2022	Graduate Molecular Biology Outreach Program, Princeton University

PEER REVIEW ACTIVITY:
NSF Graduate Research Fellowship Program
Biotechnology and Biological Sciences Research Council (BBSRC)
eLife, Nature Communications, ISME Journal, mBio, PNAS