

## CURRICULUM VITAE

MICHAEL J. GRAY

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## EDUCATION

**Ph.D.** in Microbiology, University of Wisconsin – Madison, Madison, WI, 2010.

*Thesis:* Synthesis, remodeling, and salvaging of the lower ligand of coenzyme B<sub>12</sub>.

**M.S.** in Food Science, University of California – Davis, Davis, CA, 2001.

*Thesis:* The NarX histidine kinase of *Escherichia coli*; the central domain and ligand-responsive autophosphorylation.

**B.S.** in Food Science, Cornell University, Ithaca, NY, 1999.

## PROFESSIONAL EXPERIENCE

**Assistant Professor (tenure track)**, Microbiology, University of Alabama at Birmingham (Jan. 2016 – present) Head of lab researching molecular mechanisms of stress response in bacteria. Duties include conducting and directing research, mentoring graduate and undergraduate students, writing grants and scientific papers, teaching microbiology and scientific communication to graduate and medical students, and service on departmental and university committees.

**Research Laboratory Specialist Intermediate**, Molecular, Cellular, and Developmental Biology, University of Michigan (Jan. 2015 – Dec. 2015) Conducted research on bacterial responses to oxidative stress, using biochemical, genetic, transcriptomic, physiological, and biophysical methods. Also supervised undergraduate researchers and assisted with grant and manuscript preparation.

**Postdoctoral Research Fellow**, Molecular, Cellular, and Developmental Biology, University of Michigan (June, 2010 – Jan. 2015) Conducted research on bacterial responses to proteotoxic reactive chlorine stress, using biochemical, genetic, transcriptomic, physiological, and biophysical methods. Also supervised undergraduate researchers and assisted with grant preparation.

**Lab Technician III**, Cornell University Food Safety Laboratory (Jan. 2002 – July 2004) Conducted research on food-borne pathogens *Listeria monocytogenes* and *Vibrio parahaemolyticus*. Experiments involved use of mammalian tissue culture techniques and the construction and use of promoter fusion constructs. Also assisted in general lab maintenance and support of other researchers.

**Research Assistant**, Cornell University Food Safety Laboratory (June 1997 – Aug. 1999) Assisted with research on food spoilage bacteria and pathogens including *L. monocytogenes* and *V. parahaemolyticus*. Experiments involved both phenotypic and molecular techniques.

## GRANT SUPPORT

### Current

NIH R35 GM124590-01

09/01/17 - 08/31/22

Title: Bacterial responses to reactive chlorine stress and their role in host-microbe interactions.

Role on project: PI

Annual direct costs: \$250,000

### Past

UAB Center for Redox Biology and Inflammation, Infection and Immunity (I3) Steering Committee  
Joint Research Pilot Grant

08/15/19 – 08/15/20

Title: Defining the Molecular Mechanisms that Govern Dysbiosis in the Neonatal Intestine to  
Prevent Late-onset Sepsis

Role on project: co-PI

Annual direct costs: \$60,000

UAB Faculty Development Grant Program 2016–2017

05/16/16 - 08/31/17

Title: Reactive chlorine sensing in the probiotic *Escherichia coli* Nissle 1917

Role on project: PI

Annual direct costs: \$10,000

UAB Center for Clinical and Translational Science  
CCTS Research Vouchers Program, NIH UL1TR001417

06/24/16 - 03/31/17

Title: Bioinformatics support for studies of the effect of inflammatory stress on commensal *E. coli*

Role on project: PI

Funding: \$3,750

NIH F32 GM096613-01

09/01/11 - 08/31/13

Title: Cellular stress response to the oxidizing effects of bleach

Role on project: PI (postdoctoral fellow)

NIH T32 AI07528-12

09/01/10 - 8/31/11

Title: Characterization of the hypochlorous acid stress response in bacteria and its role in bacterial  
colonization

Role on project: Appointee (postdoctoral fellow)

PI: Victor DiRita (Program Director)

## PUBLICATIONS

ORCID iD = 0000-0002-7112-4188

*h*-index = 20 (Google Scholar, 9/18/20)

### Manuscripts in preparation:

I. Bowlin, M.Q. and **Gray, M.J.** Inorganic Polyphosphate's Diverse Roles in Host-Microbe  
Interactions. *In preparation for Trends Microbiol.*

### Accepted manuscripts:

I. Konigstorfer, A., Ashby, L.V., Bollar, G.E., Billiot, C.E., **Gray, M.J.**, Jakob, U., Hampton, M.B., and  
Winterbourn, C.C. Induction of the reactive chlorine-responsive transcription factor RclR in  
*Escherichia coli* following ingestion by neutrophils. *Revised manuscript accepted at Pathogen Dis.*

## Published papers:

1. Derke, R.M., Barron, A.J., Billiot, C.E., Chaple, I.F., Lapi, S.E., Broderick, N.A., and **Gray, M.J.** The Cu(II) reductase RclA protects *Escherichia coli* against the combination of hypochlorous acid and intracellular copper. **mBio** 2020; 11(5): e01905-20.
1. **Gray, M.J.** Interactions between DksA and stress-responsive alternative sigma factors control inorganic polyphosphate accumulation in *Escherichia coli*. **J Bacteriol** 2020; 202(14): e00133-20.
2. Sinha, R., LeVeque, R., Bowlin, M.Q., **Gray, M.J.**, and DiRita, V.J. Phosphate transporter PstSCAB of *Campylobacter jejuni* is a critical determinant of lactate-dependent growth and colonization in chickens. **J Bacteriol** 2020; 202(7): e00716-19.
3. Singer, J.R., Blosser, E.G., Zindl, C.L. Silberger, D.J., Conlan, S., Laufer, V.A., DiToro, D., Deming, C., Kumar, R., Morrow, C.D., Segre, J.A., **Gray, M.J.**, Randolph, D.A., and Weaver, C.T. Preventing dysbiosis of the neonatal mouse intestinal microbiome protects against late-onset sepsis. **Nat Med** 2019; 25(11): 1772-1782.
  - News & Views: Haak, B.W. and Wiersinga, W.J. The differing roles of lactobacilli in critical illness. **Nat Med** 2019; 25(11): 1651-1653.
  - In Translation: Sanidad, K.Z. and Zeng, M.Y. LOS in The Dysbiotic Gut. **Cell Host Microbe** 2020; 27(11): 11-13.
4. Basu Thakur, P., Long, A.R., Nelson, B.J., Kumar, R., Rosenberg, A.F., and **Gray, M.J.** Complex Responses to Hydrogen Peroxide and Hypochlorous Acid by the Probiotic Bacterium *Lactobacillus reuteri*. **mSystems** 2019; 4(5): e00453-19.
5. **Gray, M.J.** Inorganic polyphosphate accumulation in *Escherichia coli* is regulated by DksA but not by (p)ppGpp. **J Bacteriol** 2019; 201(9): e00664-18. Featured article.
  - Commentary: Downey, M. A stringent analysis of polyphosphate dynamics in *E. coli*. **J Bacteriol** 2019; 201(9): e00070-19.
  - Blog post: Haeusser, D. Processing the Ps in Times of Stress: (p)ppGpp and Poly-P in the Bacterial Stringent Response. **Small Things Considered** April 13, 2020; [schaechter.asmblog.org/schaechter/2020/04/processing-the-ps-in-times-of-stress.html](https://schaechter.asmblog.org/schaechter/2020/04/processing-the-ps-in-times-of-stress.html)
6. Pokhrel, A., Lingo, J., Wolschendorf, F., and **Gray, M.J.** Assaying for Inorganic Polyphosphate in Bacteria. **J Visual Exp** 2019; 143: e58818.
7. Yoo, N., Dogra, S., Meinen, B., Tse, E., Haeflinger, J., Southworth, D.R., **Gray, M.J.**, Dahl, J.-U., and Jakob, U. Polyphosphate Stabilizes Protein Unfolding Intermediates as Soluble Amyloid-Like Oligomers. **J Mol Biol** 2018; 430(21): 4195-4208.
8. Rudat, A.K., Pokhrel, A., Green, T.J., and **Gray, M.J.** Mutations in *Escherichia coli* polyphosphate kinase that lead to dramatically increased *in vivo* polyphosphate levels. **J Bacteriol** 2018; 200(6): e00697-17.
9. Dahl, J.-U., **Gray, M.J.**, Bazopoulou, D., Beaufay, F., Lempart, J., Koenigsnecht, M.J., Wang, Y., Baker, J.R., Hasler, W.L., Young, V.B., Sun, D., and Jakob, U. The anti-inflammatory drug mesalamine targets bacterial polyphosphate accumulation. **Nat Microbiol** 2017; 2: 16267.
10. Docter, B.E., Horowitz, S., **Gray, M.J.**, Jakob, U., and Bardwell, J.C.A. Do nucleic acids moonlight as molecular chaperones? **Nucl Acids Res** 2016; 44(10): 4835-4845.

11. **Gray, M.J.**, Li, Y., Leichert, L.I.O., Xu, Z., and Jakob, U. Does the transcription factor NemR use a regulatory sulfenamide bond to sense bleach? **Antioxid Redox Signal** 2015; 23(9): 747-754.
12. **Gray, M.J.** and Jakob, U. Oxidative stress protection by polyphosphate: new roles for an old player. **Curr Opin Microbiol** 2015; 24: 1-6.
13. Dahl, J.-U., **Gray, M.J.**, and Jakob, U. Protein Quality Control Under Oxidative Stress Conditions. **J Mol Biol** 2015; 427(7): 1549-1563.
14. Knoefler, D., Leichert, L.I.O., Thamsen, M., Cremers, C.M., Reichmann, D., **Gray, M.J.**, Wholey, W.-Y., and Jakob, U. About the dangers, costs, and benefits of living an aerobic lifestyle. **Biochem Soc Trans** 2014; 42: 917-921.
15. **Gray, M.J.**, Wholey, W.-Y., Cremers, C.M., Wagner, N.O., Mueller-Schickert, A., Hock, N.T., Krieger, A.G., Smith, E.M., Bender, R.A., Bardwell, J.C.A., and Jakob, U. Polyphosphate is a Primordial Chaperone. **Mol Cell** 2014; 53(5): 689-699. Featured article. F1000Prime recommended article.
  - Preview: Kampinga, H.H. Chaperoned by Prebiotic Inorganic Polyphosphate Molecules: An Ancient Transcription-Independent Mechanism to Restore Protein Homeostasis. **Mol Cell** 2014; 53(5): 685-687.
16. Parker, B.W., Schwessinger, E.A., and Jakob, U. and **Gray, M.J.** The RclR protein is a reactive chlorine-specific transcription factor in *Escherichia coli*. **J Biol Chem** 2013; 288(45): 32574-32584.
17. **Gray, M.J.**, Wholey, W.-Y., and Jakob, U. Bacterial responses to reactive chlorine species. **Annu Rev Microbiol** 2013; 67: 141-60.
18. **Gray, M.J.**, Wholey, W.-Y., Parker, B.W., Kim, M., and Jakob, U. NemR is a bleach-sensing transcription factor. **J Biol Chem** 2013; 288(19): 13789-13798.
19. Collins, H.F., Biedendieck, R., Leech, H.K., **Gray, M.**, Escalante-Semerena, J.C., McClean, K.J., Munro, A.W., Rigby, S.E.J., Warren, M.J., and Lawrence, A.D. *Bacillus megaterium* has both a functional BluB protein required for DMB synthesis and a related flavoprotein that forms a stable radical species. **PLoS One** 2013; 8(2): e55708.
20. **Gray, M.J.** and Escalante-Semerena, J.C. A new pathway for the synthesis of  $\alpha$ -ribazole-phosphate in *Listeria innocua*. **Mol Microbiol** 2010; 77(6): 1429-1438.
21. **Gray, M.J.** and Escalante-Semerena, J.C. The cobinamide amidohydrolase (cobyrinic acid-forming) CbiZ enzyme: a critical activity of the cobamide remodeling system of *Rhodobacter sphaeroides*. **Mol Microbiol** 2009; 74(5): 1198-1210.
22. **Gray, M.J.** and Escalante-Semerena, J.C. *In vivo* analysis of cobinamide salvaging in *Rhodobacter sphaeroides* strain 2.4.1. **J Bacteriol** 2009; 191(12): 3842-3851.
23. **Gray, M.J.**, Tavares, N.K., and Escalante-Semerena, J.C. The genome of *Rhodobacter sphaeroides* 2.4.1 encodes functional cobinamide salvaging systems of bacterial and archaeal origins. **Mol Microbiol** 2008; 70(4): 824-836.
24. Noriega, C.E., Schmidt, R., **Gray, M.J.**, Chen, L.-L. and Stewart, V. Autophosphorylation and dephosphorylation by soluble forms of the nitrate-responsive sensors NarX and NarQ from *Escherichia coli* K-12. **J Bacteriol** 2008; 190(11): 3869-3876.

25. **Gray, M.J.** and Escalante-Semerena, J.C. Single-enzyme conversion of FMNH<sub>2</sub> to 5,6-dimethylbenzimidazole, the lower ligand of B<sub>12</sub>. **Proc Natl Acad Sci USA** 2007; 104(8): 2921-2926.
26. **Gray, M.J.**, Freitag, N.E. and Boor, K.J. How the bacterial pathogen *Listeria monocytogenes* mediates the switch from environmental Dr. Jekyll to pathogenic Mr. Hyde. **Infect Immun** 2006; 74(5): 2505-12.
27. Chen, Y., Ross, W.H., **Gray, M.J.**, Wiedmann, M., Whiting, R.C., and Scott, V.N. Attributing risk to *Listeria monocytogenes* subgroups: dose response in relation to genetic lineages. **J Food Prot** 2006; 69(2): 335-344.
28. **Gray, M.J.**, Zadoks, R.N., Fortes, E.D., Dogan, B., Cai, S., Chen, Y., Scott, V.N., Gombas, D.E., Boor, K.J. and Wiedmann, M. *Listeria monocytogenes* isolates from foods and humans form distinct but overlapping populations. **Appl Environ Microbiol** 2004; 70(10): 5833-41.
29. Sasahara, K.C., **Gray, M.J.**, Shin, S.J., and Boor, K.J. Detection of viable *Mycobacterium avium* subsp. *paratuberculosis* using luciferase reporter systems. **Foodborne Pathog Dis** 2004; 1(4): 258-266.
30. Ferreira, A., **Gray, M.**, Wiedmann, M. and Boor, K.J. Comparative genomic analysis of the *sigB* operon in *Listeria monocytogenes* and in other Gram-positive bacteria. **Curr Microbiol** 2004; 48(1): 39-46.
31. Douglas, S.A., **Gray, M.J.**, Crandall, A.D. and Boor, K.J. Characterization of chocolate milk spoilage patterns. **J Food Prot** 2000; 63(4): 516-21.

#### Book chapters:

1. **Gray, M.J.** and Boor, K.J. 2006. Genetics and physiology of pathogenicity in food-borne bacterial pathogens. In: **Food Biotechnology**, 2nd edition. (K. Shetty, G. Paliyath, A. Pometto, and R. E. Levin, eds.) pp. 1293-1327.

#### INVITED TALKS

1. "Disentangling inorganic polyphosphate from the general stress response of *Escherichia coli*." DFG GRK1708 "Bacterial Survival Strategies" Research Training Group symposium, Universität Tübingen, Tübingen, Germany. Oct. 7, 2020. Delivered remotely due to COVID-19.
2. "How *E. coli* senses and survives reactive chlorine stress." Murray State University Biology Department Seminar Series. Sept. 11, 2020. Delivered remotely due to COVID-19.
3. "Solving the problem of polyphosphate genetics." Polyphosphate Biology remote seminar series (organized by an informal international community of polyphosphate researchers, led by Dr. Patrick Seuss, U of Michigan). Aug. 19, 2020. Delivered remotely due to COVID-19.
4. "Regulation of inorganic polyphosphate: a primordial stress response". ASM Microbe Online Summer of Science, "Diverse stress responses in the microbial world" Symposium. July 20, 2020. Delivered remotely due to COVID-19.
5. "Gray Lab Update: Bleach, Bacteria, and Molecular Mechanisms of Stress Response." University of Alabama at Birmingham Microbiology Department Seminar Series. May 5, 2020. Delivered remotely due to COVID-19.

6. Cornell Food Safety Symposium and FSL and MQIP Reunion Weekend. July 27, 2019. Ithaca, NY.
7. "Stringent alleles of RNA polymerase inhibit inorganic polyphosphate accumulation in *Escherichia coli*." Gordon Research Conference on Microbial Stress Response. July 18, 2018. Mount Holyoke, MA.
8. "Regulation of inorganic polyphosphate, a universal bacterial stress response factor." University of Alabama at Birmingham Microbiology Department Seminar Series. May 29, 2018. Birmingham, AL.
9. "Stress regulation of inorganic polyphosphate, a ubiquitous primordial chaperone." University of Maryland Baltimore County Department of Biological Sciences Seminar Series. Nov. 29, 2017. Baltimore, MD.
10. "Bacterial responses to reactive chlorine stress: the role and regulation of inorganic polyphosphate." University of Alabama at Birmingham Biology Department Seminar Series. Apr. 19, 2017. Birmingham, AL.
11. "Bacterial responses to reactive chlorine stress." University of Alabama at Birmingham / Society for Redox Biology and Medicine Regional Redox Symposium. 2017. Birmingham, AL.
12. "Hypochlorous acid stress response in the probiotic *Lactobacillus reuteri*." Molecular Genetics of Bacteria and Phages Meeting. 2015. Madison, WI.
13. "Polyphosphate is a Primordial Chaperone. Gordon Research Conference on Stress Proteins in Growth, Development, and Disease." 2013. Mt. Snow Resort, West Dover, VT.
14. "Polyphosphate is a Bleach-Induced Chaperone." Midwest Stress Response and Molecular Chaperone Meeting. 2013. Evanston, IL.
15. "The cobinamide amidohydrolase (cobyrinic acid-forming) CbiZ enzyme: a critical activity of the cobamide remodeling system of *Rhodobacter sphaeroides*." Gordon Research Conference on Vitamin B<sub>12</sub> and Corphins. 2009. Oxford, UK.

## POSTERS

1. Molecular Genetics of Bacteria and Phages Meeting. 2019. Madison, WI.
2. Molecular Genetics of Bacteria and Phages Meeting. 2018. Madison, WI.
3. Gordon Research Conference on Microbial Stress Response. 2018, Mt. Holyoke, MA.
4. American Society for Microbiology Microbe 2017, New Orleans, LA.
5. Gordon Research Conference on Microbial Stress Response. 2016, Mt. Holyoke, MA.
6. Molecular Genetics of Bacteria and Phages Meeting. 2015. Madison, WI.
7. Gordon Research Conference on Microbial Stress Response. 2014, Mt. Holyoke, MA.
8. Gordon Research Conference on Stress Proteins in Growth, Development, and Disease. 2013. Mt. Snow Resort, West Dover, VT.
9. Federation of American Societies for Experimental Biology Conference on Mechanisms and Regulation of Prokaryotic Transcription. 2013. Saxton's River, VT.
10. Gordon Research Conference on Microbial Stress Response. 2012, Mt. Holyoke, MA.

11. Federation of American Societies for Experimental Biology Conference on Mechanisms and Regulation of Prokaryotic Transcription. 2011. Saxton's River, VT.
12. Gordon Research Conference on Vitamin B<sub>12</sub> and Corphins. 2009. Oxford, UK.
13. General Meeting of the American Society for Microbiology. 2009. Philadelphia, PA.
14. Wind River Conference on Prokaryotic Biology. 2006. Wind River, CO. (*Won poster award.*)

## TEACHING EXPERIENCE

### Courses taught:

- Jan. 11 – Feb. 5, 2021 (upcoming): Course director and instructor of graduate-level UAB Prokaryotic Genetics and Physiology course (GBS 760) – designed and taught 19 lectures; to be taught remotely due to COVID-19
- Apr. 6 – May 1, 2020: Co-instructor for graduate-level UAB Scientific Communication course (GBS 768) – designed and taught 8 lectures, participated in assessing student writing throughout module; taught remotely due to COVID-19
- Jan. 13 – Feb. 7, 2020: Co-course director for graduate-level UAB Prokaryotic Genetics and Pathogenesis course (GBSC 716) – designed and taught 9 lectures, helped coordinate the rest of the module (with Dr. David Briles, UAB Department of Microbiology)
- Dec. 18, 2019: Co-facilitator for 2-hour team-based learning exercise for UAB School of Medicine medical students.
- Oct. 23 & 28, 2019: Co-instructor for graduate level UAB Advanced Topics in Bacterial Pathogenesis course (GBS 748) – designed and taught one lecture and coordinated one 2-hour student presentation session on the same topic
- May 9 – 31, 2019: Co-instructor for graduate-level UAB Scientific Communication course (GBS 768) – designed and taught 3 lectures, participated in assessing student writing throughout module
- Jan. 7 – Feb. 1, 2019: Course director for graduate-level UAB Prokaryotic Genetics and Molecular Biology course (GBS 760) – designed and taught 6 lectures, coordinated the rest of the module
- Nov. 30, 2018: Led two 2-hour bacterial pathogenesis case discussion sections for UAB School of Medicine medical students. (Developed one of the cases used.)
- Apr. 30 – May 24, 2018: Co-instructor for graduate-level UAB Scientific Communication course (GBS 768) – designed and taught 3 lectures, participated in assessing student writing throughout module
- Jan. 8 – Feb. 2, 2018: Course director for graduate-level UAB Prokaryotic Genetics and Molecular Biology course (GBS 760) – designed and taught 7 lectures, coordinated the rest of the module
- Dec. 1, 2017: Led two 2-hour bacterial pathogenesis case discussion sections for UAB School of Medicine medical students. (Developed one of the cases used.)

Nov. 1 & 6, 2017: Co-instructor for graduate level UAB Advanced Topics in Bacterial Pathogenesis course (GBS 748) – designed and taught one lecture and coordinated one 2-hour student presentation session on the same topic

May 1 – 26, 2017: Co-instructor for graduate-level UAB Scientific Communication course (GBS 768) – designed and taught one lecture, participated in assessing student writing throughout module

Jan. 3 – 27, 2017: Co-course director for graduate-level UAB Prokaryotic Genetics and Molecular Biology course (GBS 760) – designed and taught 5 lectures, helped coordinate the rest of the module (with Dr. Michael Niederweis, UAB Department of Microbiology)

Nov. 2, 2016: UAB Center for Free Radical Biology Journal Club

Fall 2016 - present: Co-course director for UAB Bacterial Pathogenesis and Physiology journal club (GBSC 720) – meets weekly during the semester

Winter 2012: Co-designed and taught Microbiology 295, Introduction to Research in the Microbial World (1 credit), along with 3 other postdoctoral research fellows (U. of Michigan Microbiology Department).

Summer 2009: Co-designed and taught a four-day introduction to fundamental microbiology lab techniques with one other graduate student (U. Wisconsin-Madison Research Experience for Undergraduates).

Fall 2007: Teaching Assistant responsible for leading weekly discussion sections and grading exams in introductory-level undergraduate microbiology lecture course (U. Wisconsin-Madison).

Fall 2006 and Spring 2007: Participated, along with a group of faculty, post-docs, and graduate students, in the design of a new introductory-level microbiology course, emphasizing the implementation of active learning techniques (U. Wisconsin-Madison).

Fall 2006: Teaching Assistant responsible for preparing and delivering lectures, teaching microbiology techniques, and grading for twice-weekly sections in introductory-level undergraduate microbiology laboratory course (U. Wisconsin-Madison).

Spring 2005: Teaching Assistant responsible for grading, holding office hours, and delivering one lecture in a graduate-level survey course in prokaryotic molecular biology (U. California-Davis).

#### **Graduate students mentored:**

June 1, 2020 – present: Sierra Hansen (UAB Medical Scientist Training Program), M.D. / Ph.D. student

Aug. 19, 2019 – present: Julia Williams (UAB Graduate Biomedical Sciences), Ph.D. student

Oct. 16, 2017 – present: Marvin Bowlin (UAB Graduate Biomedical Sciences), Ph.D. candidate

Mar. 3, 2016 - present: Rhea Derke (UAB Graduate Biomedical Sciences), Ph.D. candidate

Oct. 19 – Dec. 18, 2020: Caitlin Costello (UAB Graduate Biomedical Sciences), rotation student

Oct. 19 – Dec. 18, 2020: Emily Hughes (UAB Graduate Biomedical Sciences), rotation student

Oct. 21 – Dec. 20, 2019: Ari Ginsparg (UAB Graduate Biomedical Sciences), rotation student

Oct. 21 – Dec. 20, 2019: Caitlin Billiot (UAB Graduate Biomedical Sciences), rotation student



Aug. 19 – Oct. 18, 2019: Gretchen Bollar (UAB Graduate Biomedical Sciences), rotation student

Aug. 13 – Oct. 12, 2018: Nicole Arroyo Diaz (UAB Graduate Biomedical Sciences), rotation student

Aug. 14 – Oct. 13, 2017: Rachel Muir (UAB Graduate Biomedical Sciences), rotation student

Jan. 3 – Mar. 10, 2017: N'Toia Hawkins (UAB Graduate Biomedical Sciences), rotation student

Oct. 17 – Dec. 16, 2016: Ashleigh Riegler (UAB Graduate Biomedical Sciences), rotation student

Aug. 15 – Oct. 14, 2016: Benjamin Hunt (UAB Graduate Biomedical Sciences), rotation student

**Service on graduate student thesis committees:**

2020 - present: Sierra Hansen (M.D. / Ph.D. student, UAB Medical Scientist Training Program - mentor)

2019 - present: Julia Williams (Ph.D. student, UAB Graduate Biomedical Sciences - mentor)

2017 - present: Marvin Bowlin (Ph.D. student, UAB Graduate Biomedical Sciences - mentor)

2016 - present: Rhea Derke (Ph.D. candidate, UAB Graduate Biomedical Sciences - mentor)

2020 – present: Samuel Dedert (Ph.D. student, UAB Graduate Biomedical Sciences, W. Swords lab, UAB Department of Medicine)

2019 – present: Rachel Andrews (Ph.D. student, UAB Graduate Biomedical Sciences, O. Kutsch lab, UAB Department of Medicine)

2017 - present: N'Toia Hawkins (Ph.D. student, UAB Graduate Biomedical Sciences, T. Dokland lab, UAB Department of Microbiology)

2017 – present: Ashleigh Riegler (Ph.D. student, UAB Graduate Biomedical Sciences, C. Orihuela lab, UAB Department of Microbiology – chair of dissertation committee)

2016 - present: James L. Kizziah (Ph.D. student, UAB Graduate Biomedical Sciences, T. Dokland lab, UAB Department of Microbiology)

2017 – 2019: Saman M. Najmi (Ph.D. student, UAB Graduate Biomedical Sciences, D. Schneider lab, UAB Department of Biochemistry and Molecular Genetics; graduated with Ph.D. Fall 2019)

2019: Charlene Farmer (M.S. student, UAB Multidisciplinary Biomedical Science Master's Program, R. Roberts lab, UAB Department of Psychiatry)

2017 - 2018: Jeffrey Singer (M.D.-Ph.D. candidate, UAB NIH Medical Scientist Training Program, C. Weaver lab, UAB Department of Pathology; graduated with Ph.D. Summer 2018)

**Service on undergraduate student honors thesis committees:**

2020: Abigail Long (UAB Science and Technology Honors College) – mentor

2019: Leanna Crafford (UAB Science and Technology Honors College) – mentor

2018: Arya Pokhrel (UAB Science and Technology Honors College) – mentor

2017: Alexandria Nichols (UAB Science and Technology Honors College) – R. Patel lab, UAB Department of Pathology

**Undergraduate students mentored:**

Fall 2018 - present: Abigail Long (UAB Science and Technology Honors College)

Summer 2018: Benjamin Nelson (UAB SIBS undergraduate research program) – directly mentored by Researcher V Poulami Basu Thakur

Fall 2017 – present: Leanna Crafford (UAB Science and Technology Honors College) – directly mentored by graduate student Rhea Derke

Summer 2017: Rachel Sutton (UAB SIBS undergraduate research program) – directly mentored by Researcher V Poulami Basu Thakur

Fall 2016 – Spring 2019: Arya Pokhrel (UAB Science and Technology Honors College)

Summer 2016: Jennifer Chavez (UAB PARAdiGM undergraduate research program)

Spring 2016 – Spring 2018: Amanda Rudat (UAB Science and Technology Honors College)

Summer 2012 – Fall 2015: Emily Schwessinger, Benjamin Parker, Nico Wagner, Adam Krieger, Nathaniel Hock, Siddhant Dogra, and Mehadi Muhith (U. of Michigan mBio and Undergraduate Research Opportunity Programs).

Summer and Fall 2011: Erica M. Smith (U. of Michigan)

Summer 2009: Karla J. Esquilin (UW-Madison Research Experience for Undergraduates).

Summer 2008: Becky Thorburn (UW-Madison Research Experience for Undergraduates).

## HONORS AND AWARDS

**Herman A. Smythe Award**, 2009: This award recognizes research excellence by a doctoral student in the UW-Madison Bacteriology department.

**Louis and Elsa Thomsen Wisconsin Distinguished Graduate Fellowship**, 2008-2009: This award is designated to support graduate students in the College of Agricultural and Life Sciences at the University of Wisconsin - Madison who have established an outstanding research record.

**Jerome J Stefaniak Predoctoral Fellowship**, 2008: This award recognizes research excellence by a doctoral student in the UW-Madison Bacteriology department.

**Herman H. and Gwendolyn H. Shapiro Medical Scholarship**, 2004-2005: This award is given to exceptional second-year students in biomedical sciences at UW-Madison.

**Wine Spectator California Fellowship**, Winter 2000: This fellowship is awarded to outstanding graduate students in viticulture and enology, reflecting my studies in the Food Science department at the UC-Davis.

**National Dairy Promotion Board Scholarship**, Spring 1998: This undergraduate scholarship is awarded based on academic achievement, an interest in a career in a dairy-related discipline, plus demonstrated leadership, initiative and integrity. I received this award while studying Food Science at Cornell University.

**Institute of Food Technologists Junior/Senior Scholarship**, Fall 1997: Awarded in recognition of outstanding academic achievement in food-related studies.

**Charles H. Roberts Scholarship**, Cornell University, Fall 1997: Awarded in recognition of academic achievement by an undergraduate student.

**General Mills Food Science Award**, Spring 1997: Award for incoming freshman or existing undergraduates with a 3.00 GPA in Food Science.

## OTHER EXPERIENCE

### Grant Review

Dec. 2020 – Feb. 2021 (upcoming): stage I reviewer for the 2021 NIH Pioneer Award Program

Dec. 2019 – Feb. 2020: stage I reviewer for the 2020 NIH Pioneer Award Program

### University Activities and Committees

Nov. 13, 2018 – present: UAB Graduate Biomedical Sciences Microbiology Theme Admissions Committee

May 29, 2017 – present: UAB Microbiology Department Bacteriology Faculty Search Committee

Jan. 4, 2016 – present: UAB Microbiology Department Seminar Series and Special Lecture Committee (co-chair as of Aug. 19, 2019), moderator of remote seminar series (starting Apr. 14, 2020, due to COVID-19 restrictions)

Apr. 22 & May 7, 2020: *ad hoc* member of UAB Microbiology Department Education Committee (participating in curriculum update discussions)

Aug. 20 & Sept. 19, 2019: *ad hoc* member of UAB Center for Clinical and Translational Science Nascent Project Panel (for Dr. Angela Carter, UAB Department of Surgery)

Dec., 2018 – Jan., 2019: faculty coordinator for the UAB Microbiology Department's contribution to the UAB School of Medicine Diversity Fair (Jan. 25, 2019), for which the department shared first prize

Jul., 2017: Department of Microbiology new website content group (with UAB School of Medicine Communication team)

### Professional Development Activities:

UAB Center for Clinical and Translational Science Workshops:

Apr. 7, 2020: Thriving in a Virtual World – Issues With Working Virtually

Apr. 9, 2020: Thriving in a Virtual World – Conducting Virtual Meetings

Apr. 14, 2020: Thriving in a Virtual World – Working With Virtual Teams

May 14 – 17, 2018: Computational Genomics Advanced Level Immersion Course for Investigators at UAB (Heflin Center for Genomic Sciences, CCTS)

UAB Center for Teaching and Learning Workshops:

Aug. 2, 2016: Faculty Foundations - New Faculty Teaching Orientation

Sept. 6, 2016: Faculty Foundations - Understanding the QEP

Oct. 4, 2016: Faculty Foundations - Disability Support Services

Dec. 6, 2016: Faculty Foundations - Understanding Research

Feb. 7, 2017: Faculty Foundations - Title IX

Mar. 7, 2017: Faculty Foundations - Guide to the IDEA Survey

Apr. 4, 2017: Faculty Foundations - Promoting Global Awareness in the Classroom

Apr. 2, 2019: High Impact Teaching to Motivate Students

Jun. 21, 2019: Teaching Effectiveness - Creating Your Syllabus

Jul. 17, 2019: Mental Health Matters – Foundations  
Mar. 23, 2020: eLearning Workshop Teaching Remotely Series – Canvas Modules  
Mar. 24, 2020: eLearning Workshop Teaching Remotely Series – Online Communication  
Mar. 25, 2020: Teaching Foundations - Teaching by Full Application  
Mar. 26, 2020: eLearning Workshop Teaching Remotely Series – Canvas Gradebook  
Mar. 26, 2020: Teaching Effectiveness - Alternative Assessment  
Mar. 27, 2020: eLearning Workshop Teaching Remotely Series – Zoom for Teaching  
Apr. 2, 2020: eLearning Workshop Teaching Remotely Series – Student Accommodations  
with DSS and in Canvas  
Jun. 8, 2020: eLearning Workshop Teaching Remotely Series – Zoom Advanced Features  
for Teaching  
Jun. 11, 2020: Mental Health Matters – Supporting Student Mental Health During the  
COVID-19 Transitions

UAB Center for Clinical and Translational Science Case Studies in Mentoring:

Aug. 7, 2017: Maintaining Effective Communication  
Aug. 28, 2017: Addressing Equity and Inclusion  
Sept. 18, 2017: Promoting Professional Development  
Sept. 25, 2017: Cultivating Ethical Behavior  
Oct. 2, 2017: Articulating Your Mentoring Philosophy and Plan  
Oct. 18, 2017: Aligning Mentor/Mentee Expectations  
Oct. 25, 2017: Assessing Mentee Understanding  
Mar. 5, 2018: Cultivating Ethical Behaviors

Jan. 20, 2017: UAB School of Medicine Junior Faculty Career Workshop

Alabama Drug Discovery Alliance Lecture Series:

Feb. 21, 2017: Introduction to Drug Discovery  
Mar. 14, 2017: Medicinal Chemistry - From Hit to Lead  
Mar. 21, 2017: High Throughput Screening  
Apr. 4, 2017: How to Submit an IND  
Apr. 18, 2017: Pharmacokinetics and ADME  
May 9, 2017: What is a Valid and Druggable Target?

Nov. 3, 2016: UAB Faculty Senate Faculty Development Promotion & Tenure roundtable  
discussion

Apr. 18-22, 2016: UAB Mentoring Academy (UAB Office of Postdoctoral Studies)

Fall 2011: Postdoctoral Teaching Short Course (U. of Michigan Center for Research on Learning  
and Teaching)

Summer 2008: semester-long Mentor Training Seminar with Dr. Jo Handelsman (Wisconsin  
Program for Scientific Teaching).

2008 – 2009: Howard Hughes Medical Institute Teaching Fellow

**Peer Reviewer (number of manuscripts reviewed):**

- Publons Record: [publons.com/a/1514968](https://publons.com/a/1514968)

American Society for Microbiology Press book chapter (1)

Antioxidants and Redox Signaling (1)

Applied and Environmental Microbiology (1)

Archives of Microbiology (1)  
Bioengineering (1)  
BMC Microbiology (1)  
Current Genetics (1)  
EcoSal Plus (1)  
F1000 Faculty Reviews (1)  
Frontiers in Microbiology (1)  
Journal of Applied Microbiology (2)  
Journal of Bacteriology (1)  
Journal of Biological Chemistry (2)  
Journal of Clinical Gastroenterology and Treatment (1)  
Molecular Microbiology (3)  
mSystems (2)  
Nature Chemical Biology (2)  
PLOS Pathogens (1)  
Proceedings of the National Academy of Sciences, USA (3)  
Research in Microbiology (2)  
Scientific Reports (1)  
The Plant Cell (1)

## OUTREACH

Jan. 2021 (upcoming): planned public release of Bacterial Genetics & Physiology Course Packet (2021 version) under a Creative Commons BY-NC-ND (Attribution – Non-Commercial – No Derivatives) 4.0 International License.

Apr. 24, 2020: publicly released BLASTER.py protein sequence analysis software under a GNU GPLv3 license ([github.com/graymicrolab/BLASTER](https://github.com/graymicrolab/BLASTER)).

Mar. 26, 2020: with other faculty of the UAB Microbiology Department, led by Dr. Sunnie Thompson, helped prepare an information sheet on COVID-19 for release to the public.

Jan. 9, 2020: publicly released Bacterial Genetics Course Packet (2020 version) under a Creative Commons BY-NC-ND (Attribution – Non-Commercial – No Derivatives) 4.0 International License. ([twitter.com/graymicrolab/status/1215303343557341184](https://twitter.com/graymicrolab/status/1215303343557341184)) Downloaded 1,561 times (as of Sept. 3, 2020).

Jun. 20, 2019: appeared on podcast Productivity Alchemy ([www.productivityalchemy.com](http://www.productivityalchemy.com), Episode 102) to discuss organization and productivity techniques for success in academic science

## PROFESSIONAL MEMBERSHIPS

American Society for Microbiology (1998 - present)  
American Association for the Advancement of Science (2016 – present)  
Union of Concerned Scientists (2016 – present)  
American Society for Biochemistry and Molecular Biology (2018 – present)

UAB Center for Free Radical Biology  
UAB Microbiome Center  
UAB Program in Immunology