

## CURRICULUM VITAE

January 2019

### William R. McCleary

Microbiology and Molecular Biology Department  
Brigham Young University  
Provo, UT 84602

### EDUCATION

|          |              |      |                                    |
|----------|--------------|------|------------------------------------|
| Post-doc | Biochemistry | 1993 | Princeton University               |
| Ph.D.    | Microbiology | 1990 | University of California, Berkeley |
| B.S.     | Microbiology | 1982 | Brigham Young University           |

### PROFESSIONAL EXPERIENCE

|              |                     |                            |                      |
|--------------|---------------------|----------------------------|----------------------|
| 2001-present | Associate Professor | Microbiology Dept.         | Brigham Young Univ.  |
| 1995-2001    | Assistant Professor | Microbiology Dept.         | Brigham Young Univ.  |
| 1993-1995    | Assistant Professor | Dept. of Micro & Immunol.  | West Virginia Univ.  |
| 1990-1993    | Postdoctoral Fellow | Dept. of Molecular Biology | Princeton University |
| 1984-1990    | Research Assistant  | Microbiology Dept.         | UC Berkeley          |
| 1984-1985    | Teaching Assistant  | Microbiology Dept.         | UC Berkeley          |
| 1982-1984    | Teaching Assistant  | Microbiology Dept.         | Brigham Young Univ.  |

### RESEARCH EXPERIENCE

|              |   |
|--------------|---|
| 1993-present | Molecular mechanisms of signal transduction in bacteria focusing on the low phosphate response of <i>Escherichia coli</i> .                       |
| 1990-1993    | Postdoctoral research on the molecular mechanisms of chemotaxis in <i>Escherichia coli</i> with Dr. Jeff Stock, Princeton University.             |
| 1984-1990    | Graduate research on the gliding bacterium <i>Myxococcus xanthus</i> under the direction of Dr. David Zusman, University of California, Berkeley. |
| 1982-1984    | Genetic analysis of the cyanobacterium, <i>Nostoc</i> sp. strain MAC under the direction of Dr. Willard Bradshaw, Brigham Young University.       |

### AWARDS & GRANTS

LFSCI-Mentoring Grant, BYU College of Life Sciences \$10,000 (Jan 2018 – Jan 2020)  
NIH R15 “Molecular Mechanisms of Phosphate Signaling in *E. coli*” (4/11-3/15)  
\$286,000  
NIH R15 “Genetic and Biochemical Studies of PhoB Activation” (8/03-7/07) \$150,000  
NIH R01 “Genetic and Biochemical Studies of PhoB” (7/96-6/01) \$485,500  
NIH R29 “Molecular Mechanisms of PhoB Activation” (7/95-6/96) \$70,000  
College of Biology and Agriculture, College Teaching Excellence Award, 2002  
College of Life Sciences, College Citizenship Award, 2010

## PROFESSIONAL SOCIETIES

American Society for Microbiology

## CITIZENSHIP

|  |                     |
|--|---------------------|
| MMBIO Faculty Development Committee, chair   | 2016 – present      |
| MMBIO Graduate Committee   | 2010– 2016          |
| Acting Chair MMBIO Graduate Committee  | Jan 2015 – Aug 2015 |
| Member NIH SCORE Grant Review Committee  | 2014-2015           |
| Life Sciences MEG Review Committee   | 2010 - 2014         |
| University Graduate Council  | 2003 – 2010         |
| University Academic Review Committee   | 2003 – 2010         |
| University Presidential Scholarship Committee  | 2001 – 2004         |
| Chair, MMBIO Rank and Status Committee   | 2005 – 2008         |
| Reviewer for multiple journals, including Journal of Bacteriology, Molecular Microbiology, Virulence, Journal of Structural Biology, PLOS One, FEMS Microbiol. Lett. |                     |

## PUBLICATIONS

1. **Vuppada, R.K., C.R. Hansen, K.P.A. Strickland, K.M. Kelly, and W.R. McCleary.** 2018. Phosphate signaling through alternate conformations of the PstSCAB phosphate transporter. *BMC Microbiol.* 18:8-16.
2. **McCleary, W.R.** 2017. Molecular Mechanisms of Phosphate Homeostasis in *Escherichia coli*. p. 333-357 In A. Samie (ed) *Escherichia coli Recent advances on physiology, pathogenesis and biotechnological applications*. InTech, Croatia
3. **Gardner, S.G., J.B. Miller, T. Dean, T. Robinson, M. Erickson, P. Ridge, and W.R. McCleary.** 2015. Genetic analysis, structural modeling, and direct couple analysis suggest a mechanism for phosphate signaling in *Escherichia coli*. *BMC Genetics.* 16(Suppl 2):S2.
4. **Gardner, S.G, K.D. Johns, R. Tanner, and W.R. McCleary.** 2014. The PhoU protein from *Escherichia coli* interacts with PhoR, PstB and metals to form a phosphate-signaling complex at the membrane. *J. Bacteriol.* 196:1741-1752.
5. **McCleary, W.R.** 2009. Application of promoter swapping techniques to control expression of chromosomal genes. *Appl Microbiol Biotechnol.* 84:641-648.
6. **Rice, C. D., J. E. Pollard, Z. T. Lewis, and W. R. McCleary.** 2009. Employment of a promoter-swapping technique shows that PhoU modulates the activity of the PstSCAB2 ABC transporter in *Escherichia coli*. *Appl Environ Microbiol* **75**:573-82.
7. **Schurdell, M. S., G. M. Woodbury, and W. R. McCleary.** 2007. Genetic evidence suggests that the intergenic region between *pstA* and *pstB* plays a role in the regulation of *rpoS* translation during phosphate limitation. *J Bacteriol* **189**:1150-3.

8. **McCleary, W. R.** 2005. No phobias about PhoB activation. *Structure* **13**:1238-9.
9. **Carmany, D. O., K. Hollingsworth, and W. R. McCleary.** 2003. Genetic and biochemical studies of phosphatase activity of PhoR. *J Bacteriol* **185**:1112-5.
10. **Allen, M. P., K. B. Zumbrennen, and W. R. McCleary.** 2001. Genetic evidence that the alpha5 helix of the receiver domain of PhoB is involved in interdomain interactions. *J Bacteriol* **183**:2204-11.
11. **Ellison, D. W., and W. R. McCleary.** 2000. The unphosphorylated receiver domain of PhoB silences the activity of its output domain. *J Bacteriol* **182**:6592-7.
12. **Zundel, C. J., D. C. Capener, and W. R. McCleary.** 1998. Analysis of the conserved acidic residues in the regulatory domain of PhoB. *FEBS Lett* **441**:242-6.
13. **McCleary, W. R.** 1996. The activation of PhoB by acetylphosphate. *Mol Microbiol* **20**:1155-63.
14. **McCleary, W. R., and J. B. Stock.** 1994. Acetyl phosphate and the activation of two-component response regulators. *J Biol Chem* **269**:31567-72.
15. **McCleary, W. R., J. B. Stock, and A. J. Ninfa.** 1993. Is acetyl phosphate a global signal in *Escherichia coli*? *J Bacteriol* **175**:2793-8.
16. **McCleary, W. R., and J. B. Stock.** 1993. Phosphorylation in bacterial chemotaxis, p. 17-41. *In* K. Kujan and B. L. Taylor (ed.), *Signal transduction: Prokaryotic and simple eukaryotic systems*. Academic Press, San Diego.
17. **Stock, J. B., M. G. Surette, W. R. McCleary, and A. M. Stock.** 1992. Signal transduction in bacterial chemotaxis. *J Biol Chem* **267**:19753-6.
18. **Lukat, G. S., W. R. McCleary, A. M. Stock, and J. B. Stock.** 1992. Phosphorylation of bacterial response regulator proteins by low molecular weight phospho-donors. *Proc Natl Acad Sci U S A* **89**:718-22.
19. **Feng, J., M. R. Atkinson, W. McCleary, J. B. Stock, B. L. Wanner, and A. J. Ninfa.** 1992. Role of phosphorylated metabolic intermediates in the regulation of glutamine synthetase synthesis in *Escherichia coli*. *J Bacteriol* **174**:6061-70.
20. **Volker, C., R. A. Miller, W. R. McCleary, A. Rao, M. Poenie, J. M. Backer, and J. B. Stock.** 1991. Effects of farnesylcysteine analogs on protein carboxyl methylation and signal transduction. *J Biol Chem* **266**:21515-22.
21. **McCleary, W. R., B. Esmon, and D. R. Zusman.** 1991. *Myxococcus xanthus* protein C is a major spore surface protein. *J Bacteriol* **173**:2141-5.
22. **Zusman, D. R., M. J. McBride, W. R. McCleary, and K. A. O'Connor.** 1990. Control of directed motility in *Myxococcus xanthus*. *Symp. Soc. Gen. Microbiol.* **46**:199-218.
23. **McCleary, W. R., and D. R. Zusman.** 1990. FrzE of *Myxococcus xanthus* is homologous to both CheA and CheY of *Salmonella typhimurium*. *Proc Natl Acad Sci U S A* **87**:5898-902.
24. **McCleary, W. R., and D. R. Zusman.** 1990. Purification and characterization of the *Myxococcus xanthus* FrzE protein shows that it has autophosphorylation activity. *J Bacteriol* **172**:6661-8.
25. **McCleary, W. R., M. J. McBride, and D. R. Zusman.** 1990. Developmental sensory transduction in *Myxococcus xanthus* involves methylation and demethylation of FrzCD. *J Bacteriol* **172**:4877-87.

## RECENT PRESENTATIONS AND INVITED TALKS

1. Hansen, C., Driggs, S., James, B, and W. R. McCleary. 2018. Studies on Phosphate transport in *E. coli*. ASM Tri-branch meeting, Durango, CO.
2. Sutherland, W., Kelly, K., Robinson, T. and W.R. McCleary. 2018. Phosphate homeostasis in *Escherichia coli*. ASM Tri-branch meeting, Durnago, CO.
3. Kelly, K.M., Wood, J.T., and W.R. McCleary. 2018. Phosphate Homeostasis mediated by transporter YjbB and polyphosphate sequestration. ASM Tri-branch meeting, Durnago, CO.
4. Kelly, K. T. Robinson, and W.R. McCleary. 2017. Phosphate homeostasis in *Escherichia coli*. New Approaches and Concepts in Microbiology. EMBO/EMBL Symposium Heidelberg Germany,
5. Nielson, C.B. and W.R. McCleary. 2017. Creation of a plasmid library for promoter-swapping to control gene expression in *Escherichia coli*. ASM Intermountain Branch Meeting. Weber State University, Ogden, UT.
6. Vuppada, R. and W.R. McCleary. 2017. Phosphate signaling through alternate conformation of the PstSCAB transporter. ASM Intermountain Branch Meeting. Weber State University, Ogden, UT.
7. Hansen, C., K Anderson, and W.R. McCleary. 2017. Studies on phosphate transport in *E. coli*. ASM Intermountain Branch Meeting. Weber State University, Ogden, UT.
8. Vuppada, R. and W. R. McCleary. 2016. The Role of PstB in Phosphate Signaling in *E. coli*. ASM Regional Meeting, Salt Lake City, UT
9. Gardner, S.G., J.B. Miller, T. Dean, T. Robinson, M. Erickson, P. Ridge, and W.R. McCleary. 2014. Genetic analysis, structural modeling, and direct couple analysis suggest a mechanism for phosphate signaling in *Escherichia coli*. BIOT Symposium, Provo, UT
10. Gardner, J., M. Barrus, T. Dean, M. Erickson, D. Scow, C. Woodward, S.G. Gardner, and W.R. McCleary. 2014. PhoU from *Escherichia coli* interacts with the PAS domain of PhoR ASM General Meeting, Boston Massachusetts.
11. Gardner, S.G. and W.R. McCleary 2014. *Escherichia coli* PhoU interacts with PstB and PhoR to signal environmental phosphate. ASM General Meeting, Boston Massachusetts.
12. Walker, V., M. Smith and W.R. McCleary. 2014. Utilization of a bacterial two-hybrid system to identify the sites of PhoU/PhoR interactions. ASM Regional Meeting, Provo, UT.
13. Gardner, J., L. Walker, and W.R. McCleary. 2014. Mapping PhoU/PhoR interaction sites using compensatory mutations. ASM Regional Meeting, Provo, UT.
14. Woodward, C., M. Erickson, and W.R. McCleary. 2014. Expression of PhoR mutations within the *E. coli* chromosome. ASM Regional Meeting, Provo, UT.
15. Gardner, S. and W. R. McCleary. 2013 Characterization of the PhoU signaling Protein of *Escherichia coli*. ASM General Meeting. Denver Colorado
16. Johns, K.D. R. Tanner, K. Richardson, and W. R. McCleary. 2013. Confirmation of protein-protein interactions between PstB and PhoU in the Pho regulon of *E. coli*. ASM General Meeting. Denver Colorado
17. Gardner, S, K.D. Johns. R. Tanner, K. Richardson, C. Callison, and W.R. McCleary. 2013. The Perplexing PhoU protein. How does it signal? Bacnet 2013. Poland
18. Gardner, S and W. R. McCleary. 2012. PhoU Function and Membrane Interaction. Poster

- session. Signal transduction in Microorganisms Gordon Conference. Ventura California.
19. Johns, K. and W. R. McCleary. 2012. Evidence for protein-protein interactions between PstB and PhoU in the phosphate signaling complex of *E. coli*. Poster session, Signal transduction in Microorganisms Gordon Conference. Ventura California.
  20. Jensen, K. and W. R. McCleary. 2011. Promoter-swapping as a Tool in the Engineering of *E. coli* strains for Biological Phosphate Removal. Poster session. Bacterial Genetics and Ecology Conference. Corfu, Greece
  21. Current Topics in Mol Life Sciences at Brigham Young University 2010 "DNA, RNA, Proteins and Metabolites: What Life's Molecules Teach Us About Gene Regulation"
  22. McCleary W. R. May 2009. Molecular Mechanisms of *E. coli*'s Phosphate Sensory Transduction Pathway. 1<sup>st</sup> International Conference on Microbial Stress: from Molecules to Systems. Sponsored by the European Federation of Biotechnology. Semmering, Austria.
  23. Rice, C.D., J.E. Pollard, Z.T. Lewis and W. R. McCleary. March 2008. Why is the absence of PhoU toxic to cells? 2nd FEBS Special Meeting ABC2008 ABC Proteins: From multidrug resistance to genetic diseases. Innsbruck, Austria.
  24. McCleary W.R. April 2007. The role of PhoU in phosphate signaling. Invited talk at the Pasteur Institute, Paris, France.
  25. Schurdell, M, Woodbury, G. and W.R. McCleary. July 2006 The regulation of stationary phase genes by a Pho-dependent processed RNA. Gordon Conference on Microbial Stress Responses. Mount Holyoke, MA

## COURSES TAUGHT

|                  |                               |                              |
|------------------|-------------------------------|------------------------------|
| <b>MMBIO 151</b> | Intro to Microbiology         | taught every year since 1996 |
| <b>MMBIO 461</b> | Advanced microbial physiology | taught each year since 1998  |
| <b>MMBIO 221</b> | General Microbiology          | taught each year since 2006  |
| <b>MMBIO 350</b> | Microbial Genetics            | taught 2005, 2006, 2007,     |
| <b>MMBIO 240</b> | Molecular Biology             | taught 2004                  |