

CURRICULUM VITAE

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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 member	2021
MMBIO Faculty Development Committee, chair	2016 – 2020
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. **Gardner, S.G., and W.R. McCleary.** 2019. Control of the *phoBR* regulon in *Escherichia coli*. *EcoSalPlus*. 8(2). doi: 10.1128/ecosalplus.ESP-0006-2019.
2. **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.
3. **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
4. **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.
5. **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.
6. **McCleary, W.R.** 2009. Application of promoter swapping techniques to control expression of chromosomal genes. *Appl Microbiol Biotechnol*. 84:641-648.
7. **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.
8. **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.

9. **McCleary, W. R.** 2005. No phobias about PhoB activation. Structure **13**:1238-9.
10. **Carmany, D. O., K. Hollingsworth, and W. R. McCleary.** 2003. Genetic and biochemical studies of phosphatase activity of PhoR. J Bacteriol **185**:1112-5.
11. **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.
12. **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.
13. **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.
14. **McCleary, W. R.** 1996. The activation of PhoB by acetylphosphate. Mol Microbiol **20**:1155-63.
15. **McCleary, W. R., and J. B. Stock.** 1994. Acetyl phosphate and the activation of two-component response regulators. J Biol Chem **269**:31567-72.
16. **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.
17. **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.
18. **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.
19. **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.
20. **Feng, J., M. R. Atkinson, W. R. 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.
21. **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.
22. **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.
23. **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.
24. **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.
25. **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.
26. **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. Driggs, S., Dean, B., Ernst, B., Kelly, K., Wood, J., Funk, S., and W. R. McCleary. 2019. Phosphate Homeostasis in *E. coli* in High Levels of Phosphate. ASM Microbe. San Francisco, CA.
2. Kelly, K. M., Dean, B., Wood, J. and W. R. McCleary 2019. Use of ScPPX to quantify polyphosphate accumulation in *E. coli* strains with mutations in phosphate homeostasis. ASM Intermountain Branch Meeting, Provo, UT.
3. Driggs, S. Ernst, B., Lang, S. and W.R. McCleary. 2019. The Identification of *E. coli* Genes that are Important for phosphate homeostasis. ASM Intermountain Branch Meeting, Provo, UT.
4. Funk, S. and W.R. McCleary. 2019. Initial experiments to understand the role of the yjbB gene product in *E. coli* phosphate homeostasis. ASM Intermountain Branch Meeting, Provo, UT.
5. Hansen, C., Driggs, S., James, B, and W. R. McCleary. 2018. Studies on Phosphate transport in *E. coli*. ASM Tri-branch meeting, Durango, CO.
6. Sutherland, W., Kelly, K., Robinson, T. and W.R. McCleary. 2018. Phosphate homeostasis in *Escherichia coli*. ASM Tri-branch meeting, Durnago, CO.
7. 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.
8. 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,
9. 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.
10. 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.
11. 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.
12. Vuppada, R. and W. R. McCleary. 2016. The Role of PstB in Phosphate Signaling in *E. coli*. ASM Regional Meeting, Salt Lake City, UT
13. 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
14. 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.
15. 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.
16. 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.

17. Gardner, J., L. Walker, and W.R. McCleary. 2014. Mapping PhoU/PhoR interaction sites using compensatory mutations. ASM Regional Meeting, Provo, UT.
18. Woodward, C., M. Erickson, and W.R. McCleary. 2014. Expression of PhoR mutations within the *E. coli* chromosome. ASM Regional Meeting, Provo, UT.
19. Gardner, S. and W. R. McCleary. 2013 Characterization of the PhoU signaling Protein of *Escherichia coli*. ASM General Meeting. Denver Colorado
20. 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
21. 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
22. Gardner, S and W. R. McCleary. 2012. PhoU Function and Membrane Interaction. Poster session. Signal transduction in Microorganisms Gordon Conference. Ventura California.
23. 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.
24. 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
25. 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"
26. McCleary W. R. May 2009. Molecular Mechanisms of *E. coli*'s Phosphate Sensory Transduction Pathway. 1st International Conference on Microbial Stress: from Molecules to Systems. Sponsored by the European Federation of Biotechnology. Semmering, Austria.
27. 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.
28. McCleary W.R. April 2007. The role of PhoU in phosphate signaling. Invited talk at the Pasteur Institute, Paris, France.
29. 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

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