

# William Harcombe

Ecology, Evolution and Behavior  
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## EMPLOYMENT AND TRAINING

- 2014-present **University of Minnesota - Twin Cities**  
Assistant Professor
- 2009-2014 **Harvard University**  
NIH Postdoctoral Fellow with Dr. Christopher Marx
- 2003-2009 **University of Texas at Austin**  
PhD – Ecology, Evolution and Behavior, with Dr. James Bull
- 2002-2003 **University of La Trobe, Australia**  
Fulbright Fellow with Dr. Ary Hoffmann
- 1998-2002 **University of North Carolina at Chapel Hill**  
Bachelor of Science – Biology Minor – Chemistry

## AWARDS

- 2014 Biocatalysis proposal funded
- 2010 NIH Kirchstein-NRSA Postdoctoral Fellowship
- 2004 NSF Graduate Research Fellowship
- 2003 Houston Livestock Show and Rodeo Fellowship
- 2002 Fulbright Fellowship: Evolution of Bacteria-Host Interactions  
Smallwood Fellowship Travel Grant
- 2001 Smallwood Fellowship for Undergraduate Research: The Transmission of Parasites through Phylogenetically Similar Prey  
Smallwood Fellowship Travel Grant
- 2000 Sigma Xi Grant-in-Aid of Research: An Experimental Investigation of Batesian Mimicry in Colubrid Snakes

## PUBLICATIONS

- Harcombe, W.R.\***, Riehl, W\*., Dukovski, I., Granger, B.R. Betts, A., Lang, A.H. Bonilla, G., Kar, A., Leiby, N., Mehta, P., Marx, C.J., Segre, D. 2014 Predicting the spatio-temporal dynamics of microbial community metabolism. *Cell Reports* 7(4):1104-1115.

- Plucain, J. Hindre, T., Le Gac M., Tenaillon, O., Cruvioller, S., Medigue, C., Leiby, N., **Harcombe, W.R.**, Marx, C.J., Lenski, R., Schnedier, D. 2014. Epistasis and allele specificity in the emergence of a stable polymorphism in *Escherichia coli*. *Science* 343(6177):1366-1369.
- Chubiz, L. Douglas, S. **Harcombe, W.R.** 2014. Combining engineering and evolution to create metabolic mutualisms between species. *Methods in Molecular Biology* 1151:39-47.
- Harcombe, W.R.** Delaney, N.F., Leiby, N., Klitgord, N. & Marx, C.J. 2013. The ability of flux balance analysis to predict evolution of central metabolism scales with the initial distance to the optimum. *PLoS Computational Biology*. 9(6):e1003091.
- Leiby, N.L., **Harcombe, W.R.**, Marx, C.J. 2012. Multiple long-term, experimentally-evolved population of *Escherichia coli* acquire dependence upon citrate as an iron chelator for optimal growth on glucose. *BMC Evolutionary Biology*. 12:151.
- Harcombe, W.R.** 2010. Novel cooperation experimentally evolved between species. *Evolution*. 64(7) 2166-2172.\*  
\*Highlighted in *Nature* 464: 145.
- Harcombe, W.R.**, Springman, R. & Bull, J.J. 2009. Partial conservation of compensatory evolution in phages deleted for a DNA metabolism gene. *BMC Evolutionary Biology*. 9(1):106
- Bull, J.J. & **Harcombe, W.R.** 2009. Dynamical constraints on the cooperative evolution of cross-feeding. *PLoS: One*. 4(1):e4115
- Cowperthwaite, M.C., Economo, E.P., **Harcombe, W.R.**, Miller, E.L., & Meyers, L.A. 2008. A simple rule shapes phenotypic evolution. *PLoS: Computational Biology*. 4(7):e1000110
- Weeks A.R., Turelli M., **Harcombe W.R.**, Reynolds K.T., & Hoffmann A.A. 2007. From parasite to mutualist: Rapid evolution of *Wolbachia* in natural populations of *Drosophila*. *PLoS: Biology*. 17:5
- Pfennig, D.W., Harper, G.R., Brumo, A.F., **Harcombe, W.R.** & Pfennig, K.S. 2007. Population differences in predation on Batesian mimics in allopatry with their model: selection against mimics is strongest when they are common. *Behavioral Ecology and Sociobiology* 61, 505-511.
- Harcombe, W.R.** & Bull, J.J. 2005. Impact of phages on a two-species bacterial community. *Applied and Environmental Microbiology* 71, 5254-5259.
- Harcombe, W.R.** & Hoffmann, A. 2004. *Wolbachia* effects in *Drosophila melanogaster*: in search of fitness benefits. *Journal of Invertebrate Pathology* 87, 45-50.
- Pfennig, D.W., **Harcombe, W.R.** & Pfennig, K.S. 2001. Evolution of mimicry in snakes. *Nature* 410, 323.

## **PRESENTATIONS**

- Harcombe, W.R. Conflict increases selection for cooperation between species. 2014. Society for the Study of Evolution Meeting, Raleigh, North Carolina.
- Harcombe, W.R., W. Riehl, I. Dukovski, B. Granger, A. Betts, A. Lang, P. Mehta, C. Marx, D. Segre. Predicting the Dynamics of 2 and 3-species Synthetic Consortia. 2013. (Poster). Gordon Conference on Microbial Population Biology, Proctor Academy, Andover, New Hampshire
- Harcombe, W.R., W. Riehl, A. Betts, C. Marx, D. Segre. Quantitatively Predicting the Evolutionary Ecology of Microbial Systems. 2013. Society for the Study of Evolution Meeting, Snowbird, Utah
- Harcombe, W.R., N. Delaney, N. Leiby, N. Klitgord, C. Marx. Predicting the Evolution of Complex Metabolic Networks. 2012. Society for the Study of Evolution Meeting, Ontario, Canada.

- Harcombe, W.R., W. Riehl, N. Cady, C. Hansel, D. Segre, and C. Marx. Evolution Alters the Social Interactions in a Model Microbial Consortium. 2012. (Poster) DOE Genomic Science Program Meeting, Washington DC.
- Harcombe, W.R., W. Riehl, D. Segre, and C. Marx. Predicting the Dynamics of a Microbial Consortium with a Systems-level Platform. 2011. (Poster). Gordon Conference on Microbial Population Biology, Proctor Academy, Andover, New Hampshire
- Harcombe, W.R. Selection in Model Microbial Consortia. 2010. Evolution of Conflict and Cooperation, Amsterdam.
- Harcombe, W.R. Microbial Community Dynamics: A systems biology and experimental evolutionary approach. 2010. Early Career Scientist Symposium, University of Michigan, Ann Arbor, Michigan.
- Harcombe, W.R. Novel Cooperation Experimentally Evolved Between Species. 2009. (Poster). Gordon Conference on Microbial Population Biology, Proctor Academy, Andover, New Hampshire.
- Harcombe, W.R. Experimental Evolution of Cross-feeding between Bacteria. 2008. Society for the Study of Evolution Meeting, University of Minnesota, Minneapolis, Minnesota
- Harcombe, W.R. Compensatory Evolution Affects Survival in a Bacterial Community. 2007. (Poster). Gordon Conference on Microbial Population Biology, Proctor Academy, Andover, New Hampshire.
- Harcombe, W.R. Parallel Genomic Evolution in Two Virus Species. 2006. Society for the Study of Evolution Meeting, State University of New York, Stony Brook, New York
- Harcombe, W. R. and J.J. Bull, Genome Interaction Not Conserved in Related Viruses: Compensatory Evolution for Ligase Deletion. 2005. (Poster). Gordon Conference on Microbial Population Biology, Andover, New Hampshire.
- Harcombe, W.R. and J.J. Bull, Phage Therapy: Bacteriophage resistance in a multi-species bacterial community. 2004 Society for the Study of Evolution Meeting, Colorado State University, Fort Collins, Colorado
- Harcombe, W.R. Is *Wolbachia* Horizontally Transmitted? 2002. Society for the Study of Evolution Meeting, University of Illinois, Urbana-Champaign, Illinois
- Harcombe, W.R., D.W. Pfennig, and K.S. Pfennig. The frequency-dependence of Batesian mimicry. 2001. (Poster). Society for the Study of Evolution Meeting, University of Tennessee, Knoxville, Tennessee

## **TEACHING**

- 2014 Instructor, *Bio 3409*, Evolution
- 2010 Teaching Fellow, *OEB 100*, Evolution in Action
- 2009 Associate Instructor, *BIO 370*, Evolution
- 2008 Associate Instructor, *BIO 301*, Scientific Decision Making
- 2007, 2008 Guest Lecturer, *BIO 364*, Microbial Ecology, Viral Diversity
- 2005 Teaching Assistant *BIO 301*, Scientific Decision Making
- 2004 Teaching Assistant *BIO 370*, Evolution

## **ACADEMIC SERVICE**

- 2003-present Journal reviewer: PLoS Computational Biology, Evolution, Proceedings B, Molecular Biology and Evolution, BMC Ecology, Genetics, BioResource Technology
- 2008 Co-organized departmental graduate student symposium
- 2005 Graduate student representative on genomics job search committee

## **HONORS**

- 2014 **Simmons Young Investigator Nominee from UMN** Mathematical Modeling of Living Systems
- 2013 **Outstanding Poster Award.** Gordon Conference on Microbial Population Biology.
- 2010 **Early Career Scientist Symposium invited speaker.** Department of Ecology and Evolution Biology. University of Michigan, Ann Arbor.
- 2009 **Life Science Research Fellowship Finalist.** Top 5% of grants received by the Life Science Research Foundation
- 2002 **Fulbright Fellow.** Australian-American Fulbright Commission.
- Coker Award,** For outstanding work in the area of organismal biology by a graduating senior at the University of North Carolina.
- Frank Porter Graham Award, Chancellor's Award,** Presented to the senior who has made the most outstanding contribution to a realization of the human ideals of equality, dignity and community at the University of North Carolina.
- 2001 **Phi Beta Kappa**