IOWA STATE UNIVERSITY
Agricultural and Biosystems Engineering

Adina Chuang Howe

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Education
Ph.D. Environmental Engineering, 2009
University of Iowa

M.S. Civil & Environmental Engineering, 2005
Purdue University

B.S. Mechanical Engineering, 2003
Purdue University

Awards
Black and Veatch Building a World of Difference Faculty Fellowship, 2015

Recent Publications

Choi, J., Yang, F., Williams, Stepanauskas, R., Cardenas, E., Garoutte, A., Williams, R., Flater, J., Tiedje, J., Hofmockel, K., Gelder, B., and **Howe, A**. Strategies to improve reference genomes for soil microbiomes. 2016. *ISME,* doi: 10.1038/ismej.2016.168

Garoutte, A., Cardenas, E., Tiedje, J., and **Howe, A.** 2016. Methodologies for probing the metatranscriptome of grassland soil. *Journal of Microbiological Methods*, doi: 10.1016/j.mimet.2016.10.018

Howe, A., Yang, F., Williams, R.J., Meyer, F., Hofmockel, K. Identification of the Core Set of Carbon-Associated Genes in Bioenergy Grassland Soil. 2016. *PloS One,* doi: 10.1371/journal.pone.0166578.

Lian, J., Choi, J., Tan, Y., **Howe, A.** Wen, Z., Jarboe, J. Identification of soil microbes capable of utilizing cellobiosan. 2016. *PloS* One, doi:10.1371/journal.pone.0149336.

Howe, A., Ringus, D., Williams, R., Choo, Z., Greenwald, S., Owens, S., Coleman, M., Meyer, F., Chang, E. Divergent responses of viral and bacterial communities in the gut microbiome to dietary disturbances in mice. 2015. *ISME,* doi: 10.1038/ismej.2015.183.

Howe, A. and Chain, Patrick. Challenges and opportunities in understanding microbial communities with metagenome assembly (accompanied by IPython Notebook tutorial). 2015. *Frontiers in Microbiology*, doi: 10.3389/fmicb.2015.00678.

Zifacakova, L., Vetrovsky, T., **Howe, A.,** Baldrian, P. 2015. Microbial activity in forest soil reflects the changes in ecosystem properties between summer and winter. *Environmental Microbiology*, doi: 10.1111/1462-2920.13026.

Teaching

TSM210 Fundamentals of Technology
ABE316 Applied Numerical Methods for Agricultural and Biosystems Engineering

Research

Dr. Howe leads the Genomics and Environmental Research in Microbial Systems (GERMS) Laboratory. The goal of the GERMS Lab (www.germslab.org) is to understand and manage the impacts of microbiology as we continuously change the environment that we live in. Our research provides data that is needed to inform our decisions and policy by developing innovative scientific methods that detect and quantify microbial activity in the environment. Our broad interests include the production, resilience, and safety of food, energy, and water resources; the impacts of land management strategies; the connection of environmental and animal microbiomes; and the large-scale detection of biomarkers for environmental health. Our past and present research includes identifying microbial drivers of biogeochemical cycling and their response to climate change; understanding contributions of microbial genes, individuals, and groups to population function and dynamics; detection of antibiotic genes and pathogen biomarkers; scalability of increasingly large sequencing datasets through the application of advanced computational approaches; and leveraging high throughput, next-generation metagenomic and metatranscriptomic sequencing to investigate interactions within environmental microbial communities. Dr. Howe is also a part of Iowa State University's Environmental Science Program, Interdepartmental Microbiology Program, and Bioinformatics and Computational Biology Program. The GERMS Lab is currently supported by Black and Veatch Building a World of Difference Faculty Fellowship; Iowa Pork Producers Association; Iowa State University; National Pork Board; University of Iowa Center for Health Effect and Environmental Contamination; USDA National Institute of Food and Agriculture; and U.S. Department of Energy, Office of Biological and Environmental Research (BER).

Professional Engagement

Dr. Howe is a member of the American Society of Agricultural and Biological Engineers (ASABE), the Association of Environmental Engineers and Science Professors (AEESP), the American Society of Engineering Education (ASEE), the American Society of Microbiologists (ASM), and Software Carpentry and Data Carpentry.