

# Chemistry of Microorganisms and Microbial Communities



Emily Patricia Balskus

## CURRENT RESEARCH

### Understanding how microbes influence our health and the environment

The vast majority of living organisms are microbial. Estimates place the total number of microbes on Earth at  $10^{30}$ ; for comparison, the human population numbers  $7 \times 10^9$ . The chemical transformations carried out by microorganisms influence human health, shape the environment, and produce medically important molecules. The recent rise in microbial genome sequencing has unveiled an unprecedented chance to understand the chemistry of the microbial world. Because of the outsized influence that microbial chemistry has on our lives and society, Prof. Emily Patricia Balskus, Associate Professor of Chemistry and Chemical Biology at Harvard University, is seizing this opportunity to discover, understand, and manipulate the chemistry of microorganisms and microbial communities. Leading an interdisciplinary team of scientists from around the world, Prof. Balskus is exploring multiple frontiers at the intersection of chemistry and microbiology. Her lab combines an understanding of enzyme mechanism with bioinformatics to rapidly identify new metabolic pathways in microbial genomes. They have discovered new enzymatic chemistry of biological importance as well as transformations that will inspire synthetic chemists and provide new tools for biocatalysis and biological engineering. Her group also studies the roles played by these new enzymatic reactions in host microbes and microbial communities, which will illuminate the importance of this chemistry *in vivo*. Additionally, Prof. Balskus is developing new approaches for manipulating chemical processes in individual microorganisms and the complex communities they inhabit. Ultimately, Prof. Balskus' research will not only improve our fundamental...

[Read More at benefunder.com/](http://benefunder.com/)

## AFFILIATION



Harvard University

## EDUCATION

- NIH NRSA Postdoctoral Fellow, in Department of Biological Chemistry and Molecular Pharmacology, 2008–2011, Harvard Medical School
- Ph.D., in Chemistry and Chemical Biology, 2003–2007, Harvard University
- M.Phil., in Chemistry Department, 2002–2003, University of Cambridge, UK
- B.A., 1998–2002, Williams College

## AWARDS

- NIH Director's New Innovator Award, 2012
- Packard Fellowship in Science and Engineering, 2013
- Kavli Fellow, National Academy of Sciences, 2013
- MIT Technology Review Innovator Under 35, 2014
- Damon Runyon–Rachleff Innovation Award, 2014

## RESEARCH AREAS

Technology, Chemistry

## FUNDING REQUEST

Your contributions will help Prof. Emily Balskus continue her research at Harvard University as she studies the chemistry of microbial communities with a special emphasis on the human microbiota. Donations will help fund the approximately \$100K/year that is needed to provide salary and lab supplies/services for each of the 20 researchers on her team. Help find ways to generate fundamental knowledge, discover novel therapeutics, and lay the groundwork for a greener tomorrow; fund Prof. Balskus' research.