

Design Principles of Microbial Communities: from Understanding to Engineering

Guest Editor: Hyun-Seob Song

Aims & Scope:

Microbes exert a huge impact on human health, our environment, and industry. In nature, microbes form communities and live socially through interactions. When subject to environmental changes, communities of interacting microorganisms rearrange their gene expression, metabolic states and interspecies interactions. As such, microbial communities are complex adaptive systems that often exhibit a high degree of functional stability. The design and control of microbial interactions remains a grand challenge for biologists and bioengineers. In order to effectively harness microbial communities to our benefit, a fundamental understanding of the principles that drive their organization and dynamics in response to environmental changes is essential. This Special Issue on “Design Principles of Microbial Communities: from Understanding to Engineering” aims to bring together original contributions that review advances in fundamental and applied research on microbial communities to address the following science questions:

- What are fundamental organizational principles of genes and species in microbial communities?
- How can the lessons obtained from natural communities be applied for designing synthetic communities?
- What are current bottlenecks in engineering microbial communities?
- What are recent developments in experimental methods that advance our understanding of microbial interactions?
- How can modeling and simulation techniques be used to develop a predictive understanding of interactions in microbial communities?

Keywords: microbial communities, metagenomics, natural communities, synthetic communities, modeling

Subtopics:

Specific topics of particular interest include, but are not limited to:

- Metagenome science
- Advanced experimental techniques enabling identifying interspecies interactions
- Understanding of microbial interactions in human and environmental communities
- Design of synthetic microbial communities and microbiomes
- Metabolic modeling of microbial communities
- Inference of gene- and species-interaction networks

Schedule:

- Manuscript submission deadline: 30 April 2017
- Peer Review Due: 15 July 2017
- Revision Due: 15 October 2017
- Announcement of acceptance by the Guest Editors: 1 November 2017
- Final manuscripts due: 30 April 2018

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