Computational and Mathematical Methods in Medicine

Special Issue on Modeling Bacterial Evolution

Call for Papers

Bacterial evolution is a major challenge for human health. The evolution and diversity of bacteria are often driven by horizontal gene transfer, via mobile DNA elements, which many times allow for the transfer of resistance or pathogenicity genes. The presence of bacteria with elevated mutation rates in natural populations—mutators—raises an evolutionary puzzle, and so does the existence of several phenotypes important for pathogenesis, such as cooperative behavior or phenotypic switching. Some bacteria offer the opportunity to study evolution in real time, allowing for the direct test of some evolutionary theories, either *in vivo* or *in vitro*.

The focus of this special issue is the mathematical analysis and modeling of processes in bacterial evolution. We are soliciting original high-quality research papers on topics of interest connected with understanding the generation and maintenance of bacterial diversity and its implications to biomedical research. Potential topics include, but are not limited to:

- Modeling the dynamics of adaptation in bacterial populations
- Modeling the evolutionary consequences of cooperative behavior in bacteria
- Methods for analysis and characterization of bacterial diversity
- Models focusing on integrating different aspects of the evolution and ecology of bacterial species

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Manuscript Due	Friday, November 4, 2011
First Round of Reviews	Friday, February 3, 2012
Publication Date	Friday, May 4, 2012

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