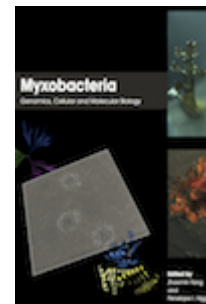


Myxobacteria

Genomics, Cellular and Molecular Biology



Edited by: Zhaomin Yang and Penelope I. Higgs

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Myxobacteria have fascinated generations of scientists since their discovery over a century ago. These bacteria represent the epitome of complex prokaryotic behaviour. Their predatory swarms move over solid surfaces utilizing two distinct motility machineries: one driven by retractable pili, and the other by a novel gliding machinery. Furthermore, under nutrient limitation, myxobacteria enter a developmental program featuring distinct cell fates and culminating in the formation of multicellular fruiting bodies filled with dormant spores.

In this book, expert myxobiologists describe important recent advances in understanding the behaviour of these bacteria at a molecular and cellular level. The book covers ecology, genomics and cell biology as well as modelling and simulation on topics including motility, development and their associated genetic regulatory networks. Authors provide the most up-to-date overview on myxobacteria and highlight open questions in the active areas of research. The book will serve as an essential reference for everyone working with myxobacteria. Chapters have been written and structured to be accessible to teachers, graduate and advanced undergraduate students new to myxobacteria, as well as experts in other fields including physical and computational sciences.

Chapter 1. Whence Comes Social Diversity? Ecological and Evolutionary Analysis of the Myxobacteria. *Gregory J. Velicer, Helena Mendes-Soares and Sébastien Wielgoss*

Chapter 2. Genome Evolution and Content in the Myxobacteria. *Stuart Huntley, Kristin Wuchet and Lotte Søgaard-Andersen*

Chapter 3. *Myxococcus xanthus* Vegetative and Developmental Cell Heterogeneity. *Penelope I. Higgs, Patricia L. Hartzell, Carina Holkenbrink and Egbert Hoiczyk*

Chapter 4. Cell Cycle Regulation in *Myxococcus xanthus* During Vegetative Growth and Development: Regulatory Links between DNA Replication and Cell Division. *Anke Treuner-Lange, Lotte Søgaard-Andersen and Mitchell Singer*

Chapter 5. Social Interactions Mediated by Outer Membrane Exchange. *Daniel Wall*

Chapter 6. Developmental Gene Regulation. *Ramya Rajagopalan, Zaara Sarwar, Anthony G. Garza and Lee Kroos*

Chapter 7. Abundance and Complexity of Signalling Mechanisms in Myxobacteria. *José Muñoz-Dorado, Penelope I. Higgs and Montserrat Elías-Arnanz*

Chapter 8. Computational Biology: From Observation to Statistical Image Analysis to Modelling and Back to Biology. *Cameron W. Harvey, Oleg A. Igoshin, Roy D. Welch, Mark Alber and Lawrence J. Shimkets*

Chapter 9. The Mechanism of A-Motility. *Jennifer Luciano, Beiyang Nan, David R. Zusman and Tâm Mignot*

Chapter 10. Type IV Pili and Exopolysaccharide-dependent Motility in *Myxococcus xanthus*. *Zhaomin Yang, Chengyun Li, Carmen Friedrich and Lotte Søgaard-Andersen*

Chapter 11. Sensory Regulation of *Myxococcus xanthus* Motility. *Emilia M.F. Mauriello, Beiyang Nan and David R. Zusman*

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