

Preface

The genus *Pseudomonas* represents a diverse group of medically, environmentally and biotechnologically important bacteria. Pseudomonads are characterized by an enormous metabolic capacity, which is reflected by their capability to (i) adapt to diverse and challenging environments, (ii) degrade recalcitrant compounds, and (iii) synthesize a variety of low-molecular-weight compounds as well as biopolymers.

In this book a selection of scholarly *Pseudomonas* review papers is presented by internationally recognized researchers who have been active in the field over many years.

The aim of this book is to provide a concise and comprehensive survey of all relevant aspects related to the genus *Pseudomonas*. The first chapter introduces us to *Pseudomonas* genomics by comparing about 20 genomes from various pseudomonads, emphasizing the vast genomic diversity in this group of bacteria. The species *P. aeruginosa*, an opportunistic human pathogen causing chronic infections in the lungs of cystic fibrosis (CF) patients, is of particular clinical relevance. Molecular mechanisms of adaptation to the unique CF lung environment as well as pathogenicity mechanisms of this species are discussed in two chapters. *P. aeruginosa* has emerged as a model organism for biofilm studies. One chapter has been dedicated to describing the recent advances in understanding the complex processes of biofilm formation. The ability to thrive in diverse environments requires complex regulatory networks implementing synthesis of a number of signal molecules, motility and chemotaxis, which have been thoroughly outlined in chapters depicting the respective individual aspects. Since various pseudomonads show particular interactions with plants not only as pathogens, but also causing promotion of plant growth, one chapter is dedicated to comprehensively describing the adaptation of pseudomonads to the particular plant environment. Plasmids and bacteriophages are important contributors to the genetic diversity found in pseudomonads, and recent advances in these fields are concisely summarized in two separate chapters.

The book closes with a chapter comprehensively outlining the use and potential applications of pseudomonads in biotechnology. Applications in bioremediation,

bioconversion, and as a cell factory for the production of low-molecular-weight compounds, biopolymers and recombinant proteins are discussed.

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