

Preface

The term surfactant refers to those compounds that have tension active properties, or in other words, the molecules that reduce interfacial tension. Their chemical composition can vary widely, but they have in common their amphiphilic or amphipatic nature and can thus be soluble in aqueous as well as in organic solvents. These characteristics make surfactants useful in a wide variety of industries, based on their abilities to lower surface tensions, increase solubility, their detergency power, wetting ability, and foaming capacity.

However, the surfactants used by industry include so far almost exclusively synthetic surfactants. The term biosurfactant refers to different tensioactive compounds produced by living cells, but a large body of research has been carried out with those produced by bacteria, yeast, or fungi. These compounds include molecules with different chemical structures, which play different roles in the life-cycle of each of these microorganisms.

Despite the very small amount of the surfactant market that is represented by biosurfactants, there is an increasing interest in microbial biosurfactants for several reasons. First, biosurfactants are considered environmentally “friendly” since they are relatively nontoxic and biodegradable. Second, biosurfactants have unique structures that are just starting to be appreciated for their potential applications to many different facets of industry, ranging from biotechnology to environmental cleanup.

This “Microbiology Monographs” volume covers the current knowledge and the most recent advances in the field of microbial biosurfactants. Each chapter is written by one or more expert scientists working on one class of these biosurfactants. These reviews include the physicochemical properties of biosurfactants, their role in the physiology of the microbe that produced them, the biosynthetic pathway for their production, including the genetic regulation, and their potential biotechnological applications.

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We also want to acknowledge Jutta Lindenborn for her support in the editing process and Springer for publishing this monograph. We hope very much that this project of writing a book that reviewed the fascinating field of surfactants produced by microbes will be appreciated by the readers.

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Biosurfactants

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