Foreword

Microorganisms mediated our planet's transformations and are key components of the biogeochemical cycles that keep Earth functioning. They are very sensitive to environmental conditions, and changes in the microbial communities' diversity and abundance can bring severe consequences to environmental or organism functions. Moreover, microbiomes are not only key components of all living beings but can be an essential part of them. As regards humans, even some features we consider so particular, such as our talents and moods, can be influenced by the microbial diversity of our guts. Knowing and understanding the balance, or unbalance, of different microbial populations in environmental or host samples can allow us to describe diseases and ecosystem impacts and can also provide the development of solutions based on the manipulation of such microbiome compositions.

Our challenge is to describe the microbial communities' patterns in different samples (humans, animals, and environmental), correlating them with biotic and abiotic factors, to establish connections between different elements of the system and microbiota profiles and functions. Understanding microbiomes and their mechanisms of interactions can allow us to manipulate environmental and host conditions. In parallel, it is fascinating to discover new metabolites and molecular pathways, complete the gaps in our knowledge in evolutionary history, and provide biotechnological resources. This justifies the interest in producing a book that presents the fundamentals of the frontline technologies that are being used for characterizing and mining such resources.

This book is edited by two admirable and determined young scientists, Dr. Thiago Bruce Rodrigues and Dr. Amaro Emiliano Trindade Silva, and it is a compilation of contributions from leading experts in the field from various parts of the world. The book is organized into three sections—Section I: Fundamentals, Section II: Methods, and Section III: Applications—that together contain 15 chapters designed to cover the general as well as specific aspects of microbes' potential and their exploitation in environmental biotechnology. *Molecular Diversity of Environmental Prokaryotes* can not only help us better understand some aspects of basic and applied environmental microbiology, but it can also offer an intervention that can move readers toward a deeper critical consciousness about the importance of microbiology as a scientific area that creates new paradigms for understanding human beings, health, and the environment.

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