
Preface

The discipline microbiology is researched actively, and the field is advancing continually. It is estimated that only about 1 % of all of the microbe species on earth have been studied. Rapid advances in molecular biology have revolutionized the study of microorganisms in the environment and improved our understanding of the composition, phylogeny, and physiology of microbial communities. The advent of molecular biology has offered a number of revolutionary new insights into the detection and enumeration of soilborne microorganisms. DNA sequences provide information on identifying unknown species from 16S and ITS rRNA sequences of individual bacterial and fungal species. Molecular methods monitor both pathogens and also beneficial organisms in soils for detection and quantification. The in-depth exploitation of PCR potential led to more sophisticated variants of the technique (improved even from the currently expanding real-time PCR) that increases the speed and sensitivity in microbial identification and diagnostics. These molecular techniques provide new insights about their functions and interactions within ecological niches.

Analyzing Microbes—Manual of Molecular Biology Techniques is a practical guide to the application of important molecular biology techniques in microbiological research. The chapters are written by a group of international scientists who are recognized authorities in their research areas from universities/researchers and often the new techniques that are described. These volumes are aimed for graduate, postgraduate, Ph.D. students, and laboratory technicians working in different biotechnology/microbiology laboratories. It is also valuable to the larger community of researchers who have recognized the potential of genomics research and may be beginning to explore the technologies involved. Moreover, the volumes are also targeted as handouts for students, teachers, and researchers world over.

The central parts of the chapters are the experimental protocols which are presented so as to be readily used at the laboratory bench. Although a number of the procedures described represent the tried and trusted, we have striven to include variants on existing technologies that an experiment can be performed. These step-by-step protocols are intended to be concise and easy to follow. Suggestions to successfully apply the procedures are included, along with recommended materials and suppliers. A special feature of the chapters is that, in addition to the protocols, important background information and representative results of applying the methods are given. References are provided to enable the investigator to become better acquainted with

the topic. Researchers in any field that utilizes microbial systems will find this work of value. In addition to microbiology and bacteriology, this book highlights the current state-of-the-art molecular microbiology techniques in biotechnology, microbiology research, and environmental microbiology.

The aim of the book *Analyzing Microbes—Manual of Molecular Biology Techniques* has been to produce a self-contained laboratory manual which will be useful to both experienced practitioners and beginners in the field. We hope that this book stimulates your creativity and wish you success in your experiments.

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