
Preface

Staphylococcus aureus is one of the major bacterial pathogens that commonly causes superficial skin and soft tissue infections, surgical wound infections, and sometimes-fatal bloodstream infections and pneumonia. The continuing emergence of drug-resistant pathogens, especially multiple-drug-resistant isolates and methicillin-resistant *S. aureus* (MRSA), is causing serious concerns in the public health due to the limited choice of antibiotics for effective treatment of MRSA infections. The availability of whole genome sequences and advanced high-throughput technologies enables us to develop a specific and rapid diagnosis method, investigate and elucidate mechanisms of bacterial evolution to antibiotic resistance and pathogenicity, and to identify novel targets to develop more potent therapeutic and/or preventive agents.

Since the publication of first edition, there have been tremendous advances on *S. aureus* genomes and technologies, including advanced next-generation RNA sequencing technologies. The aim of this second edition of the MRSA protocol book is to provide an advanced and comprehensive collection of the most up-to-date techniques for the detection, genotyping, and investigation of MRSA. Each chapter starts with a brief introduction to the method and its purpose and then almost immediately goes on to provide very detailed protocols for every step of the analysis. The protocol chapters also contain a section with tips on individual steps that are not usually found in a methods book but that may represent the difference between immediate success and lengthy troubleshooting.

This book is an excellent starting point for anyone who wants or needs to set up a new method to study MRSA. Most of the methods are oriented toward routine clinical diagnosis, surveillance, research, and actual practice for treatment of patients infected by MRSA. Importantly, we include several review chapters to allow the scientists and clinicians to better understand the epidemiology of MRSA, overall diagnosis and molecular typing approaches, clinical treatment of MRSA infections, as well as the status of drug discovery for combating MRSA. Although the book mainly focuses on MRSA, it should be a valuable reference for technicians and scientists working on other pathogens.

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Protocols

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