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.

*St. Paul, MN*  
*Yinduo Ji*
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Contributors

Annaliesa S. Anderson • Pfizer Vaccine Research, Pearl River, NY, USA
Gregory M. Anstead • Medicine Service, South Texas Veterans Health Care System, San Antonio, TX, USA; Division of Infectious Diseases, Department of Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA
Aaron Becker • Biomedical Genomics Center, University of Minnesota, St. Paul, MN, USA
Jose Cadena • Medicine Service, South Texas Veterans Health Care System, San Antonio, TX, USA; Division of Infectious Diseases, Department of Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA
Laura C. Case-Cook • Center for Pharmaceutical Biotechnology, University of Illinois at Chicago, Chicago, IL, USA
James E. Cassat • Division of Pediatric Infectious Diseases, Vanderbilt University Medical Center, Nashville, TN, USA
Chi Chen • Department of Food Science and Nutrition, University of Minnesota, St. Paul, MN, USA
Anu Daniel • Cubist Pharmaceuticals, Lexington, MA, USA
Patrice François • Service of Infectious Diseases, Genomic Research Laboratory, Geneva, Switzerland
Shin-ichi Fujita • Department of Laboratory Sciences, School of Health Sciences, Kanazawa University, Kanazawa, Japan
Xiao Han • Department of Infection Control Science, Graduate School of Medicine, Juntendo University, Tokyo, Japan
Yiping He • Molecular Characterization of Foodborne Pathogens Research Unit, US Department of Agriculture, Agricultural Research Service, Eastern Regional Research Center, Wyndmoor, PA, USA
Keiichi Hiramatsu • Department of Infection Control Science, Graduate School of Medicine, Juntendo University, Tokyo, Japan
Denis Hochstrasser • Department of Human Protein Sciences, Faculty of Medicine, Geneva University, Department of Genetic and Laboratory Medicine, Geneva University Hospitals, Geneva, Switzerland
Anne Holmes • Laboratory of Healthcare Associated Infections, Centre for Infections, Health Protection Agency, London, UK
Teruyo Ito • Department of Infection Control Science, Graduate School of Medicine, Juntendo University, Tokyo, Japan
Heta Javeri • Division of Infectious Diseases, Department of Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA
Yinduo Ji • Department of Veterinary and Biomedical Sciences, College of Veterinary Medicine, University of Minnesota, St. Paul, MN, USA
Yuki Katayama • Department of Infection Control Science, Graduate School of Medicine, Juntendo University, Tokyo, Japan