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## Preface

Heart disease is the leading cause of death in developed countries. Recent experimental advances featuring cellular, molecular, and genetic tools and technologies offer the potential for new therapeutic strategies directed toward remediation of inherited and acquired heart diseases. Whether these recent basic science advances will ultimately translate to clinical efficacy for patients with heart disease is unknown and is important to ascertain. *Cardiac Cell and Gene Transfer: Principles, Protocols, and Applications* is designed to provide the reader with up-to-date coverage of a myriad of specific methodologies and protocols for gene and cell transfer to the myocardium. Each chapter features a “Notes” section that provides useful “how to” problem-solving insights that are often left unstated in standard published protocols.

*Cardiac Cell and Gene Transfer: Principles, Protocols, and Applications* addresses principles and applications of cell and gene transfer to the heart, including protocols for vector production and purification. Detailed step-by-step methods and applications for first/second-generation adenoviral vectors, adeno-associated vectors, gutted adenoviral vectors, and lentiviral vectors are included. Additionally, detailed methods for cardiac cell grafting and transplantation are provided, and these chapters highlight the prospects of cell-based therapies for cardiac repair. The book also covers specific in vivo techniques for cardiac gene transfer, and specifies subsequent cellular and organ-level physiological assessment techniques and protocols. Accordingly, this book is designed for basic science and clinical researchers in the academic, pharmaceutical, and biotechnology sectors of the cardiovascular community.

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