
Preface

The aim of *Molecular Cardiology: Methods and Protocols* is to document state-of-the-art molecular and genetic techniques in the area of cardiology. These modern approaches enable researchers to readily study heart diseases at the molecular level and will promote the development of new therapeutic strategies. Methods for genetic dissection, signal transduction, and microarray analysis are excellent tools for the study of the molecular mechanisms of cardiovascular diseases. Protocols for transgenesis take advantage of recent advances in many areas of molecular and cell biology. Transgenic models of heart diseases (cardiac hypertrophy, cardiac dysfunction, and so on.) are powerful tools for the study of heart disease pathogenesis. Methods for gene transfer to heart tissue using viral and nonviral vectors form the basis of gene therapy for heart diseases. Heart-specific promoters containing a hypoxia-inducible cardioprotective gene switch are key for protection of the heart from ischemia. Gene and stem cell therapies open novel and exciting avenues for the prevention and treatment of heart diseases.

Molecular Cardiology: Methods and Protocols consists of 26 chapters dealing with various aspects of molecular cardiology, including gene transfer and gene therapy for cardiovascular disease, stem cell therapy for cardiovascular disease, gene analysis in the injured and hypertrophied heart, and transgenesis in cardiovascular research. This book provides step-by-step methods for the successful completion of experimental procedures, and would be useful for both experienced and new investigators in the field of molecular cardiology. The “Notes” section in each chapter contains the most critical information and provides valuable troubleshooting guides to help develop protocols for your research. This book, however, is not all-inclusive owing to the broad range and fast advances in molecular biological technology.

Molecular Cardiology: Methods and Protocols should be of general interest to both basic and clinical researchers and of special interest to cardiovascular researchers, cardiologists, and molecular biologists.

I have been very fortunate to enlist a group of renowned experts in molecular cardiology for this book. I would like to thank them for their dedication and contribution. I very much appreciate the constant guidance and support from Dr. John Walker, the series editor. Many thanks also go to Thomas Lanigan and Craig Adams at the Humana Press for their professional assistance in the successful completion of this book.

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