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## Preface

This book forms part of the highly acclaimed *Methods in Molecular Biology*<sup>TM</sup> series, which aims to provide a detailed reference manual giving a step-by-step approach to reproduce various complex protocols within your own laboratory. For each volume in this series, editors have included the most interesting and relevant methodologies published in the field in recent years, thereby providing access to the most novel experimental approaches. In addition, this series also provides a detailed notes section which documents specific information relating to particularly challenging aspects of a methodology.

The past two decades have seen an explosion in the number of research articles relating to both the physiological and pathological responses evoked by nitric oxide generation. Despite this, accurate quantification of nitric oxide in either in vitro or in vivo models remains challenging, due to the relatively unstable nature of the molecule.

This volume considers two of the main aspects of nitric oxide research. Section I of the book includes a review from an expert in tumor radiosensitization induced by various novel compounds, including nitric oxide. The review covers multiple facets of nitric oxide including its role in addiction, the cardiovascular system, the nervous system, and cancer. The remainder of Section I describes various disparate protocols relating to the direct detection and quantification of nitric oxide. These include techniques which detail how to image real-time in vivo generation of nitric oxide, quantify nitric oxide production in the rat brain, and detect ultralow levels of nitric oxide in the pM range.

Section II focuses primarily on techniques designed to either inhibit or enhance nitric oxide, with an aim to achieve therapeutic gain. These include inhibition of the nitric oxide synthase enzymes using viral, shRNA delivery systems to prevent cardiovascular dysfunction, peripheral neuropathy, and graft rejection. Other techniques highlighted deal with the overproduction of nitric oxide at target sites using novel nitric oxide releasing nanoparticles and biofilms.

We hope this book provides clarification on the numerous complex methodologies detailed in each chapter, proving to be an invaluable resource for anyone with an interest in nitric oxide research.

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