Nitric Oxide Protocols
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Edited by

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Preface

It is now recognized that nitric oxide (NO) plays an essential role in many biological systems, both as an inter- and intracellular signaling mechanism in such diverse areas as the vascular system, the immune system, and neural communication. In addition, overproduction of NO has also been implicated as a crucial factor in many pathological situations, particularly in inflammation, diabetes, stroke, neurodegeneration, and sepsis. The involvement of NO in physiological and pathological situations is now far-ranging, and interest in the biochemistry, physiology, and pharmacology of NO is still expanding rapidly. Therefore, it seems an appropriate time to produce a book containing protocols relevant to all workers in the nitric oxide field.

In Nitric Oxide Protocols I have attempted to gather together chapters from all areas of nitric oxide research and to provide detailed methods covering a very wide variety of techniques, including cloning, expression, and purification of the different NO synthase isoforms; quantitation of the rate of transcription and translation of NO synthases using RT-PCR, Northern, and Western blotting; quantitation of NO production itself both in vivo and in vitro; and direct measurement of the activity of NO synthase. In addition, a number of issues—such as the use NO donors, peroxynitrite, and NO gas to mimic endogenous NO production—have been included, together with chapters on the use of inhibitors of NO synthase and the measurement of nitrotyrosine residues in proteins, on DNA damage, and on apoptosis caused by NO production. Two chapters have also been included on the assay of GTP cyclohydrolase I activity and the measurement of biopterin, and since these are particularly relevant to NO production, on the use of inhibitors of biopterin biosynthesis. Throughout the book, the aim has been to highlight the merits of each assay or procedure and compare them with other available methods, and where possible a number of different alternative procedures are described. Potential problems and common errors encountered with each of these protocols have been highlighted, and in many cases the Introduction and Notes sections of related chapters provide a valuable source of information. The reader is therefore encouraged to browse through related chapters to extract the maximum benefit.

This book could not have been produced without the help and cooperation of all those authors who kindly contributed their chapters, and I should
like to thank them for their efforts. In particular I should like to thank Richard Knowles both for his chapters and also advice as to the content of the book. I should also like to thank the series editor, John Walker, for his rapid response and constant advice and encouragement throughout the preparation of the book.

Michael A. Titheradge
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