
Preface

Atherosclerosis: Experimental Methods and Protocols aims to provide the reader with a compilation of techniques that will prove useful to active investigators across the field of experimental atherosclerosis research. In fact, this volume is unique, the first devoted to a broad spectrum of techniques and assays, some adopted from other disciplines, not previously brought together in one book. Our approach is designed to permit researchers to select the techniques that will answer their particular sets of questions, in any of the expanding number of both animal models and in vitro systems now available for studying factors contributing to the development or progression of atherosclerotic lesions. Researchers can only benefit from this collection of relevant techniques, written and explained by experts in each of these fields.

Both investigators beginning in the field of atherosclerosis studies and researchers entering the field from related but different areas of study will benefit from *Atherosclerosis: Experimental Methods and Protocols*. Sufficient background is provided for a beginner to carry out the techniques described in the chapters, yet great depth is achieved owing to the special expertise of the authors. Researchers new to the field of atherosclerosis will appreciate the benefits of having these techniques gathered in one volume for their investigations. In addition, researchers already in the field of atherosclerosis research may benefit from the wide array of techniques and ideas provided by enjoying expanded opportunities to investigate their hypotheses.

Practical information regarding sample collection, choice of model system, experimental design, and data analysis techniques are each provided in these chapters. In addition to methods for both well-documented and novel techniques, chapters summarizing general aspects of atherosclerosis research, such as animal models, are included. A summary of newly emerging animal models, in particular, genetically manipulated mice, provides sufficient information to become involved in this exciting new area of research. Assay systems for serum or plasma determination are becoming increasingly relevant in diagnostic and epidemiological studies, and have accordingly been described in many of the chapters. Both traditional and newer methods for identifying and separating classes and subclasses of lipoproteins have been included, along with

assays for more recently identified plasma proteins implicated in atherogenesis, such as cholesteryl ester transfer protein, homocysteine, glycated lipoproteins, and apolipoprotein(a). Chapters describing the isolation and culture of cells and glycosaminoglycans from atherosclerotic plaques follow, and may form the basis of many in vitro assays. In vivo techniques for the collection and analysis of experimental atherosclerotic lesions have been included in the later chapters. Finally, a comprehensive overview describing gene therapies under recent investigation in the field of atherosclerosis/restenosis—along with a practical example of successful implementation of such a therapy in pigs—have been included.

Obtaining a general overview of the material included in *Atherosclerosis: Experimental Methods and Protocols*, prior to a more detailed study of particular chapters, will illuminate many facts broadly related to atherosclerosis that may be useful initially, or later, in the course of a research program. Included in the “Notes” section of each chapter is additional information sufficient for successful application of the technique. Often this kind of detail is lacking from brief methodological descriptions in the literature. From their excellent working knowledge of the techniques described, our authors may save a new researcher much time and effort. The compilation of these techniques into a single volume will hopefully benefit many researchers in pursuit of understanding, diagnosing, and ultimately preventing or treating atherosclerosis.

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