
Preface

In 1999, *Lipid Second Messengers*, edited by Suzanne G. Laychock and Ronald P. Rubin, was published as part of the Methods in the Life Sciences—Methods in Signal Transduction series. This new addition represents an update to the previous publication and contains many new chapters that highlight the rapidly changing field of lipid-mediated signal transduction. This new edition is divided into four parts giving the reader an opportunity to examine a wide array of modern techniques used in the field. In Part I, methods used to assay and identify the expression of different enzymes involved in lipid-mediated signaling are described and includes chapters on phospholipases A₂, C, and D (Chapters 1 through 3) as well as a chapter on diacylglycerol kinase (Chapter 4), a key enzyme involved in regulating diacylglycerol levels in cells. This part also contains a chapter (Chapter 5) focused on the analysis of enzymes involved in the endocannabinoid system, giving readers the depth and breadth of the typical enzyme systems involved in lipid-mediated signaling. Part II highlights the use of mass spectrometry to assess the lipid content in various systems. Chapter 6 includes the use of shotgun lipidomics to examine phospholipid molecular species. Chapters 7 and 8 focus on techniques for the analysis of sphingolipids, isoprostane, and neuroprostane levels. Part III contains two chapters (Chapters 9 and 10) devoted to techniques used to determine the role of lipids in the activation of gene transcription. While Chapter 9 is quite extensive and covers many nuclear transcription factors, Chapter 10 highlights the use of advanced fluorescence methods to examine the interaction of proteins involved in lipid ligand-induced gene transcription. Finally, Part IV focuses on methods used to assess fatty acid uptake and metabolism. The use of classical chromatography techniques to measure fatty acids is presented in Chapter 11, which complements Chapter 6 on shotgun lipidomics. A chapter on fatty acid uptake and targeting (Chapter 12) is also found in this part, which complements chapters in many parts of this book, but also brings out many of the nuances important to measuring fatty acid uptake that are often overlooked. Chapter 13 focuses on using steady-state radiotracer kinetics to assess fatty acid incorporation and turnover *in vivo*, and outlines methods that are applicable to many different experimental paradigms.

By bringing together leading authorities in the field, this book describes a wide range of commonly used techniques used to assess lipid-mediated signal transduction. We hope that the depth and breadth of this new addition to the series will provide researchers additional insight into the field and a convenient compilation of methods to overcome research challenges.