Preface

The key to every biological problem must in the end be sought in the cell and yet, although we know a lot about the mechanism by which cells operate, there is still a shortage in our understanding of how lipids affect cell biology. For years lipids have fascinated cell biologists and biochemists because they have profound effects on cell function. Encoded within lipid molecules is the ability to spontaneously form macroscopic, two-dimensional membrane systems. In addition to their function as physical and chemical barriers separating aqueous compartments, membranes are involved in many regulatory processes, such as secretion, endocytosis, and signal transduction. The functional interaction between lipids and proteins is essential for such membrane activities.

Lipids serve as one of the major sources of energy, both directly and when stored in adipose tissues. They also act as thermal insulators in the subcutaneous tissues and serve as electrical insulators in myelinated nerves, allowing the rapid propagation of waves of depolarization. Some lipids act as biological modulators and signal transducers (e.g., pheromones, prostaglandins, thromboxanes, leukotrienes, steroids, platelet-activating factor, phosphatidylinositol derivates) and as vehicles for carrying fat-soluble vitamins.

Research on cell biology is at present in a very active phase and molecular genetics is helping us to recognize and exploit the unity of all living systems and to reveal the fundamental mechanisms by which the cell operates.

The challenge in composing a book on *Cellular lipid metabolism* has been to select concepts that are important for our understanding in areas that have changed or in which new concepts have emerged. Recognizing that it is impossible to be comprehensive, I have tried to ensure that this book provides a survey of cell biology *in areas that I consider important.*

This book was planned to be a resource for scientists at post-doctoral level and above, in other words, a rather specific publication to highlight recent findings in cell biology and biochemistry but also to include important findings made in the past and give a good overview. I contacted the best experts in 13 fields and the chapters represent their specialized contributions. They represent analyses at the molecular level and reveal the principles by which cellular lipid metabolism functions.

There are still large areas of ignorance in cell biology and numerous intriguing observations that cannot be explained. In this volume we try to expose them and to stimulate readers to contemplate and discover ways of solving the open questions.

I hope this book will be of interest to all reasearchers in the area of cell biology, lipid metabolism and atherosclerosis, providing a useful review of accomplishments and a stimulating guide for future studies.

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