

Preface to the Third Edition

The first edition of *Molecular Endocrinology* was published 15 years ago. It was originally written out of desperation: the author was teaching a course of the same name and could not find a textbook that covered this field in the depth and breadth that he required. About a decade later, several texts on signaling began to appear; although their coverage of signaling pathways was adequate, they still failed to embrace the full range of hormone action and did not closely relate signaling to hormone effects and interactions, which are the core of endocrine control. This deficiency, coupled with tremendous advances in the field of molecular endocrinology, provided the impetus for writing the third edition.

Molecular Endocrinology is first and foremost an endocrinology text. Indeed, it begins with an introductory unit on basic endocrinology for those readers who have not yet been exposed to the discipline. Such an introduction is critical for understanding how hormones act at the molecular level and why their signaling pathways synergize or antagonize each other in the manner they do. This section is followed by units on receptors, second messengers, transcription, and a final section on a few special topics. However, the emphasis is always on hormone action and integration. For example, in the latter half of Chapter 12, there is a comprehensive discussion of several hormones that have signaling pathways linked to their cellular actions. In addition, glycogen metabolism and smooth muscle contraction are discussed with respect to how the second messengers of the regulating hormones interact. In Chapter 13, this discussion is carried into the nucleus, where it is applied to transcription. Through these discussions the molecular aspects of signaling can be related to the gross effects of hormones in organisms.

This edition contains several new sections. As noted previously, in Chapter 12 there is a discussion of step-by-step pathways for several important hormones. Such a molecular analysis of hormone action would have been impossible just a few years ago; its presentation in Chapter 12 attests to how far molecular endocrinology has advanced. There is also a new chapter: Chapter 4 is a brief synopsis of signaling and prefaces Part 2. Its creation arose from the fact that the processes of endocrinology are so integrated that it is impossible to present one topic without encountering several others. For example, receptors are presented first because they are the first cellular structure hormones encountered. However, receptors are regulated by phosphorylation, and the relevant kinases are not discussed until later. If the kinases were covered first, then the readers would have no appreciation of the receptors and signaling pathways that activated them. In other words, every subject appears to be a prerequisite for discussing any other subject. Chapter 4 is designed to provide the reader with key concepts and components of receptors and second messengers prior to their detailed discussions in subsequent chapters.

The text has also been extensively updated. Since the second edition, the three-dimensional structure of many important receptors and transcription factors has been published, and the mechanisms of action of these receptors and factors have been elucidated. In addition, there have been major advances in the understanding of the modular nature of signaling and the importance of compartmentalization. Finally, the new discipline of proteomics combined with the sequence of the genomes from several species has added flesh to the chapter on the evolution of the endocrine system and comparative endocrinology.

There is also a major stylistic change: detailed references to specific facts have been replaced by recent review articles. This change freed up considerable space for the updated material and was made possible by the abundance of reviews currently available in the literature. However, if readers would like to have the specific reference for any statement of fact in this text, they are welcome to contact the author.