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Preface

SIGNALING BY THE WNT FAMILY OF SECRETED PROTEINS has come to be recognized as one of the most fundamental and conserved regulatory systems in animals. Wnt signaling controls many critical aspects of development and adult tissue homeostasis and its deregulation is intimately linked to a broad spectrum of human diseases, ranging from congenital defects to osteoporosis and cancer. As such, Wnt-related research has become a major area for targeted drug discovery and therapeutic development.

Since the identification of the first Wnt gene 30 years ago, research in the Wnt field has taken flight—as reflected by more than 13,000 publications in Medline to date—and has progressed into numerous exciting areas. Wnt-related investigations continue to reveal fascinating principles of embryonic patterning, cell growth and differentiation, the wiring of the nervous system, the pathogenic mechanisms underlying cancer as well as degenerative disease, stem cell and regenerative biology, and potential therapeutic applications. This book on Wnt signaling is therefore both timely and long overdue.

When the plan for this book was first conceived, we felt that it should cover the scope of the Wnt field as broadly as we could envision. We have therefore organized the various chapters to include the biochemistry and molecular mechanisms that control Wnt signal transduction (Section I), in parallel to the evolutionary origin of Wnt signaling and its functions in the development of model organisms (Section II). A major focus lies on the role of Wnt signaling in stem cell biology and differentiation (Section III), as our knowledge in this area has increased tremendously over the last decade or so. Finally, the implications of Wnt signal transduction for pathogenesis and treatment of human diseases are presented in Section IV. As this book is published in the same year as the 30th anniversary of the discovery of the *int1/wnt1* gene, we have included a separate chapter describing the history of the Wnt field, in the form of a personal perspective by Roel Nusse and Harold Varmus. This chapter was previously published by *EMBO J* (doi:10.1038/emboj.2012.146) and is reprinted with kind permission from the editor.

The pace of progress in the Wnt field has been astonishing, and several chapters had to be revised even at the production stage to include the latest exciting discoveries that just appeared in the literature. However, in spite of its broad range, this book does not pretend to cover all of the fascinating insights we have gained in Wnt biology over the years. It is our hope that this volume serves as a stepping-stone for the reader to guide and encourage further exploration and, perhaps, to open up novel avenues of investigation, particularly applications in the fields of bioengineering, regenerative medicine, and cancer treatment.

A big thank you goes to all of the authors who contributed timely chapters so enthusiastically to this project. We are very grateful to Richard Sever and in particular to Barbara Acosta at CSHL Press, who guided and coordinated the entire process and who showed tremendous patience in managing our deadlines.

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