METHODS IN MOLECULAR BIOLOGY

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Estrogen Receptors

Methods and Protocols

Edited by

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Preface

Estrogen is a fascinating hormone whose physiological roles extend far beyond the female reproductive system and maintenance of the species. Estrogen is known to regulate tissues such as bone, brain, the cardiovascular system, skin, liver, adipose tissue, the immune system, salivary glands, colon, male reproductive tissues, and others. Estrogen appears to have both positive and negative effects in the cardiovascular system. In the breast and uterus, the important physiological effects of estrogen on breast and endometrial growth can be diverted to stimulate the growth of tumors. Both the physiological and pathological effects of estrogen are mediated by estrogen receptors which are divided into two types: the genomic nuclear estrogen receptors, estrogen receptor α (ERα) and estrogen receptor β (ERβ), and the nongenomic estrogen receptor, GPER/GPR30 and possibly other nongenomic receptors.

This volume includes chapters on a wide array of technologies that are important to advancing our understanding of the receptor-mediated actions of this important hormone. The protocols range from standard methods and important laboratory workhorses such as receptor binding assays and western blot to newer technologies such as RNAseq and proximity ligation assay, as well as many others. We have included protocols from a broad range of tissue types to demonstrate the variety of estrogen receptor effects. We hope that scientists who are intrigued by the many faces of estrogen will find the protocols detailed in this book helpful and inspirational.

About 15 years ago a visiting professor told me that there was no point in continuing to study the effects of estrogen that everything that needed to be known was known and I should move on to other things. The wide range of cutting-edge technologies described in this volume testifies to the fallacy of his statement and demonstrates that the field of estrogen receptors and estrogen actions continues to be vibrant and exciting.

I want to express my appreciation to all of the authors who wrote chapters for the book and who tolerated my requests for further explanation on the fine points of their protocols. I am also grateful to Dr. John Walker, series editor, who provided excellent guidance on how to edit a methods book as we moved through the various stages of preparation. And to the readers, I trust that you will find the protocols in this book useful and that the step-by-step instructions will give you the confidence to try new protocols and expand your research repertoire.

Vermillion, SD, USA — *Kathleen M. Eyster*

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