Book Review

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Hormones, Genes, and Cancer. Edited by Brian E. Henderson, Bruce Ponder, and Ronald K. Ross. New York: Oxford University Press, 2003. Pp. 450. $89.

Hormones, Genes, and Cancer is a unique book, reviewing the role of hormones in cancer etiology, treatment, and prevention. In this book, breast and prostate cancers have been emphasized, whereas endometrial, ovarian, and testicular cancers have been briefly discussed. This is a multiauthor book, in which experts in a given field were engaged successfully to review the state of the art of research in the molecular genetics, etiology, progression, and prevention of hormone-related cancers.

It consists of 22 chapters, the first 4 of which introduce steroid hormones, the nuclear-receptor superfamily, and genomic approaches to hormone-responsive cancer. Estrogen metabolism and breast cancer are reviewed in 10 chapters. Five chapters are devoted to prostate cancer and androgen metabolism, whereas endometrial, ovarian, and testicular cancer are each summarized in one chapter.

The first chapter is a basic introduction to hormonal carcinogenesis and current trends in hormone-related cancer. This chapter, written in a straightforward manner, gives a brief introduction to the field and is not unnecessarily detailed.

The second chapter, entitled "Biosynthesis, Transport, and Metabolism of Steroid Hormones," is well written and emphasizes the balance between production and clearance of steroid hormones in the human body. The major pathways are explained in a way that is easy to follow.

The nuclear-receptor superfamily, the largest family of transcription factors, is summarized in chapter 3. Because of the large number of members of the nuclear-receptor superfamily, different classification methods have been utilized, as discussed in this chapter, including consideration of dimerization status, DNA-binding specificity, and the nature of the chemical ligands. In addition to findings regarding classical steroid and thyroid hormone receptors, studies of the function of the more recently discovered orphan receptors, such as peroxisome proliferator–activated receptors, in the proliferation of malignant cells are also presented. The discussion of other aspects of transcriptional control by nuclear receptors and by crosstalk between nuclear receptors and other transcription factors is very useful, since nuclear receptors can influence the activities of other transcription factors in a positive or a negative manner. The citation of more than 470 references makes this chapter a good resource for those who might need additional information about any specific member of the nuclear-receptor superfamily.

Chapter 4, "Genomic Approaches to the Genetics of Hormone-Responsive Cancer," very briefly summarizes the ways of studying cancer genetics with hormone-responsive cancer as a model. This chapter is too concise to be useful for those in the cancer genomics field. However, it gives an overview of different approaches that could be applied to cancers that are not hormone dependent. Although not discussed in great detail, recent developments in techniques increasingly utilized by many investigators in the last decade—such as gene expression microarrays, RNA interference approaches, and SNP technology—are described. One can understand the difficulty—and perhaps the impossibility—of covering recent developments in these fields in a book, because of the revolution in genomics and human genetics that has followed the presentation of first-draft sequences of the whole human genome in early 2001. This chapter should lead the reader toward the possibility of exploring a variety of approaches. In that respect, it should attract physicians and other investigators who wish to increase their awareness of different approaches in the field but do not need an extensive, detailed discussion.

Breast cancer is emphasized the most in this book, because it is not only the most common cancer in women worldwide but also the most widely studied hormone-related cancer. It is reviewed extensively in 10 chapters, including sections dealing with its molecular endocrinology, the relationship between exogenous hormone use and breast cancer risk, estrogen biosynthesis, the relationship between metabolism and breast cancer predisposing genes, families that carry *BRCA1* and/or *BRCA2*, studies of hormonal approaches to prevention, and progression from hormone-dependent to hormone-independent disease. Chemoprevention with tamoxifen and estrogen receptor modulators is summarized in one chapter that covers pilot studies and clinical trials around the world. The review of estrogen biosynthesis genes, including P-450 aromatase and estrogen metabolism genes (*HSD 17B1* and *HSD 17B2*) is very informative, in that it reveals molecules that might be involved in breast cancer pathogenesis. This is a good overview for those entering this field.

Prostate cancer epidemiology and molecular endocrinology, androgen receptor signaling, hereditary prostate cancer, androgen-independent prostate cancer progression, and hormonal therapies for prostate cancer are reviewed in subsequent chapters. These chapters are very well written by the experts in their fields. They cover most of the recent developments in prostate cancer genetics and androgen metabolism. However, recent findings on germline mutations in the ribonuclease L gene, a candidate *HPC1* gene at 1q25, have not been included in the section on hereditary prostate cancer, in which the authors present studies on major prostate cancer susceptibility loci. Another drawback of the book is the variation in the

interpretations of conflicting findings in different chapters, which is not uncommon in multiauthor books. For example, in one chapter, the authors emphasize the association of the androgen receptor CAG repeat with the risk of developing prostate cancer. They mostly dismiss the other studies that could not find such a correlation, suggesting that this failure could be due to small sample sizes, population differences, and/or failure to appropriately match cases and controls in such studies. However, in the next chapter, different authors review this area and conclude that no evidence for association between CAG repeats and prostate cancer risk was observed. Although this conflict has the potential to confuse the reader, it might actually be helpful to show that such correlation is not yet clear, thereby leading investigators to perform more research on the subject.

The last three chapters review endometrial, ovarian, and testicular cancers, and, for the most part, they cover epidemiology and molecular endocrinology of these diseases.

Overall, I wholeheartedly recommend *Hormones, Genes, and Cancer* to the physicians, investigators, and students in the fields of genetics, endocrinology, and oncology. I think each of them will find much in this book that will be beneficial.

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