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Transcription Factors and Human Disease. By Gregg L. Semenza. New York: Oxford University Press, 1998. Pp. 368. $49.95.

Transcriptional regulation is an extremely complex process requiring multiple protein factors and *cis*-acting elements. The discovery of novel transcription factors and our understanding of the known ones are burgeoning. As reported in numerous articles in this and other genetics journals, defects in many of these players cause serious consequences, including heritable human diseases. In *Transcription Factors and Human Disease,* Gregg L. Semenza brings together, in an accessible package, many of the key conclusions from the recent literature on transcriptional control in human and mouse development.

This timely book examines the role of transcriptional regulation in the context of human pathophysiology. Because the field of human molecular genetics is changing so quickly, any attempt at a comprehensive review of genes with known mutations that affect transcription would soon become outdated. The author acknowledges this potential problem and chooses instead to present a survey that illustrates general principles.

Transcription Factors and Human Disease is divided into two parts. The first, consisting of chapters 1–3, provides a detailed overview of RNA polymerase II transcription and its regulation by *cis*-acting sequence elements and *trans*-acting protein factors. The second and longer part of the book focuses on human diseases caused by abnormal transcriptional regulation. Semenza provides relevant clinical information along with a concise description of the normal function of the protein under discussion and the probable effects of different mutations. Particularly useful is the inclusion of mouse-genetic studies that illuminate the findings in humans. Chapter 4 presents examples of germline mutations within *cis*-acting regulatory sequences. Chapters 5–12 describe various classes of sequence-specific DNA binding proteins that have been associated with genetic disorders. Mutations in coactivators, which exert their effect on transcription via protein-protein interactions, are detailed in chapter 13. Chapter 14 covers diseases that arise from mutations in general transcription-factor genes, such as *ERCC2, ERCC3,* and *ERCC6*—genes that are better known for their role in DNA repair but that participate in transcriptional regulation as well. After chapter 15, which illustrates the variety of somatic mutations that result in altered transcriptional regulation and cancer, Semenza closes the book with a discussion of developmental pathways that are affected by such teratogens as retinonic acid and ethanol.

The information presented in each chapter is clearly written and well referenced. The author has gone to considerable effort to present the background and experimental results that support the data and conclusions. His approach works very well in the second part of the book, in which each section deals individually with a transcription factor or regulatory element; however, it is less successful in the first part of the book, in which a section may cover a broader range of material. In some sections of part I it is difficult to see the "big picture" because some of the information is too detailed. Overall, I found *Transcription Factors and Human Disease* to be very informative and readable. It should be a useful text or reference for students, scientists, and clinicians who wish to learn about the relationship between molecular defects in transcription and human pathophysiology.

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