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Review of *Genes and the Environment* by R. H. Burdon

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Book Review

Genes and the Environment, R. H. Burdon, 1999, Taylor & Francis.

How diverse aspects of an organism's environment influence the structure and function of its genes is of profound importance for understanding the molecular basis of evolution as well as the causes of disease, cancer and aging. *Genes and the Environment* addresses these issues from a molecular biological perspective. The author covers both natural environmental influences, such as extreme temperatures and water stress, as well as human-caused environmental influences, such as exposure to toxic chemicals. The author makes an effort to compare and contrast prokaryotic and eukaryotic systems and highlights distinctions between major groups of eukaryotes e.g., plants versus animals. to the extent that current knowledge permits. This book was written as a text for upper undergradu-

ate students studying in the fields of biochemistry, molecular biology, biotechnology, microbiology, toxicology and environmental sciences. As such, it is relatively brief i.e., 243 pages, but touches on a wide range of timely topics.

Following an introductory chapter, the remainder of the book is divided into three main sections. The first section, which comprises seven chapters, and hence most of the book, deals with gene damage. In Chapter 2 the kinds of environmental factors that damage DNA are introduced. Chapter 3 describes the kinds of errors that occur to DNA. Chapter 4 deals with DNA damage occurring from cellular free radicals. Chapter 5 describes detoxification and antioxidant defence systems. Chapter 6 provides an overview of the different kinds of DNA repair mechanisms, whereas Chapter 7 highlights the processes of gene transcription and translation, and Chapter 8 addresses the relation-

ships between DNA damage, mutation, cancer and aging. The second section of the book comprises chapters 9 and 10. The former describes the molecular and biochemical processes associated with the responses of genes to specific types of environmental stresses, whereas the latter discusses possible biotechnological applications of stress-response genes and their products. The third section of the book, which is entitled *The Environment, Genes, Biodiversity and Cancer*, and which consists of the final chapter, provides a look to the future with an emphasis on the relationship between human-caused environmental influences and cancer.

The structure of the book is not entirely logical, and there is some redundancy among the topics covered in the different chapters. Readers do need to have some knowledge of molecular biology and biochemistry, and in places the use of technical terminology may be a bit heavy for many undergraduate courses a glossary of key terms would have been helpful in this regard. However, each chapter begins with a bullet list of key points, ends with a list of literature sources and additional reading, and includes an abundance of good figures

that provide an effective aid to understanding otherwise rather abstract concepts. All of these features are likely to be appreciated by student readers. Overall, *Genes and the Environment* provides a nice overview of the responses of DNA to environmental influences. That it does so in the space of relatively few pages, while covering both natural and anthropogenic environmental influences and touching on pertinent features of the molecular and biochemical systems of both prokaryotes and eukaryotes, are some of the book's unique strengths.

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