DESCRIPTION

Understanding the play between heredity and environment, and relating it to disease causation, is the task of ecogenetics. Gene-Environment Interactions: Fundamentals of Ecogenetics presents the first comprehensive survey of this discipline, reflecting its relationship with toxicology, epidemiology, pharmacology, public health, and other medical and biological fields.

Divided into four sections, the text elucidates key basic and advanced topics:

* Section 1 covers fundamentals, including the history of the discipline, a discussion of the molecular laboratory tools currently available to assess genotypes, using such measurements in molecular epidemiology studies, and the statistical issues involved in their analysis.

* Section 2 focuses on a number of key genetic polymorphisms relevant for ecogenetics, including enzymes of phase I and phase II metabolism, enzymes involved in DNA repair, as well as receptors and ion channels. This highlights characteristics of selected, widely studied genotypic/phenotypic differences, and allows discussion of how given genetic variations can influence responses to exogenous chemicals.

* Section 3 examines gene-environment interactions through a disease-based approach, addressing how genetic polymorphisms can influence susceptibility to various diseases. Chapters cover important disease conditions such as various types of cancer, neurodegenerative diseases, cardiovascular disease, chronic pulmonary diseases, infectious diseases, diabetes, and obesity.
The final section discusses the ethical, legal, and social issues that arise when investigating and evaluating genetic polymorphisms in human populations, as well as the impact of ecogenetics on risk assessment, regulatory policies, and medicine and public health.

Packed with clear examples illustrating concepts, as well as numerous tables and figures, Gene-Environment Interactions: Fundamentals of Ecogenetics is a unique resource for a wide range of physicians, students, and other specialists.

ABOUT THE AUTHOR

Lucio G. Costa, Ph.D., is professor of environmental health and toxicology at the University of Washington School of Public Health and Community Medicine. He is also director of the NIEHS-sponsored Neurotoxicology Research Core at the Center in Ecogenetics and Environmental Health. His research is focused on the study of the cellular, biochemical and molecular mechanisms involved in neurotoxicity using biochemical, molecular and imaging techniques.

David L. Eaton is Professor of Environmental Health and Associate Dean for Research in the School of Public Health and Community Medicine at the University of Washington. He serves as Director of the Center for Ecogenetics and Environmental Health, and is also Deputy Director for a major NIEHS-sponsored research initiative in the area of toxicogenomics. Dr. Eaton's research interests focus on understanding how subtle genetic differences between individuals and species can result in potentially large differences in susceptibility to chemical carcinogens.

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