

Study of the 20 000 to 30 000 genes making up the human genome cannot fully explain how hundreds of cell lines can derive from a single embryonic stem cell; the differences found between monozygotic twins; heritable prion proteins; nor many of the manifestations of tumors, cancer and other diseases. Epigenetics may offer the key.

Epigenetics is the term given to heritable traits that occur over rounds of cell division and sometimes trans-generationally, through reversible mechanisms that do not involve changes to the underlying DNA sequence. These mechanisms are regulatory networks involving DNA methylation, histone modification, nucleosome location, and noncoding RNA, that result in patterns of gene expression. The *Epigenome*, in parallel to the word *genome*, refers to the overall epigenetic state of a cell, and can be considered essentially a network of chemical switches.

This book presents the current state of knowledge on these mechanisms, going beyond the genome itself and into the emerging field of epigenetic medicine.



Robert A. Meyers obtained his PhD in Organic Chemistry at the University of California at Los Angeles. He was a post-doctoral fellow and member of the faculty at the California Institute of Technology and has more than 17 patents, 50 technical papers and 12 books to his name. As Editor-in-Chief he conceived and edited several ambitious multivolume reference works, e.g. the *Encyclopedia of Analytical Chemistry* (Wiley), the *Encyclopedia of Molecular Cell Biology and Molecular Medicine* (Wiley-VCH) and *Molecular Biology and Biotechnology* (Wiley-VCH).



Covering everything from Alzheimer's Disease to the Zebrafish Genome, the *Encyclopedia of Molecular Cell Biology and Molecular Medicine* represents the most detailed and up to date peer reviewed treatment in existence covering the molecular and cellular basis of life. It is thus an authoritative reference source for undergraduate and graduate students, faculty, librarians and researchers in industry and government. Available online at www.meyers-emcbmm.com.

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