EPIGENETIC PRINCIPLES OF EVOLUTION

SECOND EDITION

NELSON R. CABEJ

Epigenetic Principles of Evolution, Second Edition, fully examines the causal basis of evolution from an epigenetic point of view. By revealing the epigenetic "user" of the "genetic toolkit," this work demonstrates the primacy of epigenetic mechanisms and epigenetic information in generating evolutionary novelties.

The author convincingly supports his theoretical perspective with a host of examples from varied fields of biology, emphasizing changes in developmental pathways as the basic source of evolutionary change in metazoans. The book therefore provides a broader view of epigenetic mechanisms of evolution, moving beyond conventional changes in epigenetic structures such as DNA methylation, histone modifications, and patterns of miRNA, sRNA, and mRNA expression.

This second edition is thoroughly updated to reflect new evidence, as well as developing theories in the field of evolutionary epigenetics. New and revised chapters speak to the epigenetic basis of heredity, epigenetic regulation of animal structure and homeostasis, neural manipulation of gene expression, central control of gametogenesis, epigenetic control of early development, the origin of epigenetic information, evolutionary changes in response to environmental stressors, epigenetics of sympatric evolution, and epigenetics of the Cambrian explosion among other topics.

Key Features

- Adopts an integrative approach to examine the causal basis of evolution from an epigenetic point of view, with the aim of overcoming current difficulties in the theory of evolution
- Features all new and revised chapters, which reflect novel experimental and observational evidence in the field of evolutionary epigenetics, as well as alternative theoretical approaches
- Offers a broad view of epigenetic mechanisms of evolution, moving beyond conventional changes in epigenetic mechanisms such as DNA methylation, histone modifications, and patterns of miRNA, sRNA, and mRNA expression

GENETICS

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Part I
Epigenetic Basis of Metazoan Inheritance

1. Control Systems and Determination of Phenotypic Traits in Metazoans

Part II
Epigenetics of Circumevolutionary Phenomena and the Mechanism of the Evolutionary Change

Part III
Epigenetics of Metazoan Evolution