



Epigenetics in stone. Two complex expressions.

states. DNA methylation, one of the best-characterized modifications, is described in depth in the chapter by En Li and Adrian Bird and is also discussed in chapters focusing on transcriptional regulation, heterochromatin formation, and genomic imprinting. Several chapters consider the changes in chromatin states imposed through covalent and noncovalent modifications of histones. The nearly exhaustive table of histone modifications presented in an appendix will undoubtedly be very useful for many researchers. The absence of a table of the corresponding modifying enzymes may reflect the difficulties in creating such a list with all the names from various species and the as-yet-unmet requirement for coherent terminology.

The discussions of the “histone code hypothesis,” which describes how histone modifications can convey information (5, 6), raise the issues of the likely complexity of such a marking system and the extent to which it is possible to appreciate whether a given combination is heritable (thus epigenetic) or merely a signal for a short-term response. *Drosophila* genetics provides a beautiful example of how histone modifications and epigenetics can be linked. In the fruit fly, key components in the regulation of homeotic genes during development, the polycomb group and the trithorax group, proved to promote specific histone modification. Two chapters (by Ueli Grossniklaus and Renato Paro and by Robert Kingston and John Tamkun) illustrate the role of these

complexes in transcriptional regulation. Steven Henikoff and Mitchell Smith describe another layer of complexity, which arises in the potential of histone variants to regulate gene expression. Other contributors note recent findings showing the involvement of noncoding RNAs in epigenetic phenomena.

In the last chapters, contributors discuss recent molecular insights into the roles of epigenetics during development and human disease—topics that have been of interest since the birth of epigenetics. Clarifying the picture of molecular epigenetic mechanisms that may act during nuclear reprogramming or human cancer, these chapters open the discussion to the implications of epigenetics in medicine.

With its focus on recent conceptual advances concerning chromatin-based epigenetics, this relatively concise book has, of course, neglected some aspects of a rapidly evolving field. Interested readers can find helpful complementary coverage in a recent special issue of *Cell* (7). Given the technical challenges to understanding epigenetic events, the book might have included more detailed discussions of the methods used to study DNA methylation or the modification status of chromatin at gene-specific and global levels. We would also have welcomed a chapter dedicated to emerging technologies in epigenomic research. New methodological approaches will clearly be needed to understand epigenetic-based events that regulate cell fate. Lastly, although the conceptual perspectives provided by the contributors may well last longer than a compilation of reviews, research in the field is moving very fast, and even conceptual outlines can evolve.

As a whole, *Epigenetics* is an impressive volume. The contributors provide an accurate survey of the field, from where it began, through where it is today, to where it is heading. Their accounts help set the stage for deepening our understanding of epigenetic phenomena and mechanisms. And the volume will undoubtedly prove to be very useful for students and researchers alike.

References

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BROWSING

Academic Charisma and the Origins of the Research University. William Clark. University of Chicago Press, Chicago, 2006. 668 pp. \$45, £28.50. ISBN 9780226109213.

Focusing on changes between the 1770s and the 1830s, Clark offers detailed accounts of lecture and seminar formats, grading systems, the conduct of examinations, the doctoral dissertation, library catalogs, and the appointment of professors. He argues that traditional academic customs and practices were transformed by market forces and competition among the small states of 18th-century Germany. To reap the benefits of having prestigious universities and scholars, bureaucrats established criteria for monitoring classroom diligence and publication productivity. This wide-ranging, thought-provoking book will reward anyone interested in the origins and early evolution of modern *Homo academicus* and its environment.