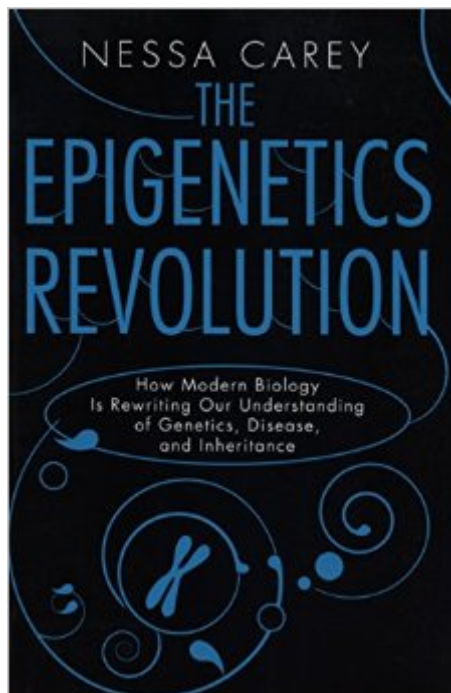


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The Epigenetics Revolution: How Modern Biology Is Rewriting Our Understanding Of Genetics, Disease, And Inheritance



Synopsis

Epigenetics can potentially revolutionize our understanding of the structure and behavior of biological life on Earth. It explains why mapping an organism's genetic code is not enough to determine how it develops or acts and shows how nurture combines with nature to engineer biological diversity. Surveying the twenty-year history of the field while also highlighting its latest findings and innovations, this volume provides a readily understandable introduction to the foundations of epigenetics. Nessa Carey, a leading epigenetics researcher, connects the field's arguments to such diverse phenomena as how ants and queen bees control their colonies; why tortoiseshell cats are always female; why some plants need cold weather before they can flower; and how our bodies age and develop disease. Reaching beyond biology, epigenetics now informs work on drug addiction, the long-term effects of famine, and the physical and psychological consequences of childhood trauma. Carey concludes with a discussion of the future directions for this research and its ability to improve human health and well-being.

Book Information

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Customer Reviews

This is one of those books that introduces an entirely new and fascinating topic. A similar work would be *Chaos: Making a New Science* which introduced the concepts of chaotic dynamical systems at a time when even many practitioners of the sciences would not have heard of it. Similarly, this book introduces the discoveries in epigenetics (epi- meaning "on", or a layer on top of classical genetics) and pretty much all of this will be new information unless you have been

actively working in the field of cell biology over the past few years. The book talks about the paradigm shift that is occurring as cell biologists are realizing that this epigenetic information is as complex and important to the correct function of life as the underlying DNA genome, and even allows for Lamarckian inheritance in certain cases where an offspring's own epigenetic information and phenotype can be influenced by that of the parents, meaning that some environmental effects in a parent's life can directly influence future generations. Also much of the non-protein-coding genome that for many years was considered to be unimportant "junk" is now turning out to be very important as it can be transcribed into functional RNA molecules that perform important functions. The book contains a simple graphic showing that the ratio of the non-protein-coding DNA to that of traditional protein coding genes increases in direct proportion with the complexity of the organism. The fundamental genes and proteins between say a chimpanzee and a human are virtually identical and it now begins to look as though it's that "junk" DNA that makes all the difference.

The Epigenetic Revolution, How modern Biology is Rewriting our Understanding of Genetics, Disease and Inheritance. This book is about the recent developments in epigenetics: interesting, fascinating, exciting, marvelous and sometimes mind-boggling. But not a revolution, epigenetics is not really overthrowing anything, but discovering a lot; it is not re-writing our understanding of Genetics, Disease and Inheritance, it is actually simply writing it. That being said, cut out the hype and you have a fascinating book, a GREAT introduction to epigenetics, a field in which quite some developments happened in the past decade. Epigenetics in the broad sense is anything that influences the expression of genes. We have known for decades that there must be something more than just the genetic code (hence not revolutionary), since our cells are quite different, while having the same DNA. What epigenetics is doing is discovering the mechanisms. A journey of discovery rather than a revolution. So far the methylation of cytosine (cytosine pre guanine: CpG) in DNA and the acetylation of histone-tails and accompanying cascades appear to be the most important mechanisms. Why are identical twins not identical? How are half the X chromosomes switched off (at least in female eutherian mammals)? Why don't we grow teeth in our eyes? How does imprinting found in mammals and flowering plants work? That -and quite a bit more- is expression of genes, and that is what epigenetics is all about. And this book will give you insight. The implications for possible therapies for a range of pathologies, from autism to cancer, are fascinating, potentially much more promising than the disappointing gene therapies. As yet -the author is honestly clear on that- only just that: potential promises.

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