

A not-so-rough guide to genes and cloning



The Rough Guide to Genes and Cloning

By Jess Buxton and Jon Turney

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Reviewed by Morag Stewart and Mickie Bhatia

Genes, genetics and cloning are common-place words that elicit a variety of reactions to breakthroughs made in these fields and to the scientists engaged in these activities. *The Rough Guide to Genes and Cloning* enables readers outside these fields to decipher fact from fiction and to understand the immense complexities, biological, historical and ethical, surrounding these fascinating topics.

The book begins by introducing the reader to the biology behind genetics. The authors assume that the reader has little or no previous experience with cell biology or genetics, but has the ability to understand fairly complex topics. This section describes the discovery and the nature of DNA and how it is converted, through transcription and translation, into the functional protein end-product. It also explains the biology of chromosome formation and segregation during cell division. This section contains a considerable amount of fundamental information for the reader to absorb and understand; however, the authors excel in their ability to guide the reader through the masses of information and jargon. Technical facts are peppered throughout with biographical clips and historical perspectives relating to each step in the long journey that began with Friedrich Miescher's original isolation of the mysterious nuclein (later termed nucleic acids) from "pus-soaked bandages" in 1869, to the sequencing of the human genome in 2000.

The book documents the events that have taken place over the past one hundred years that led to the completion of the mammoth project of sequencing the entire human genome. The authors then move on to discuss how science is currently using this information, the potential future uses and the issues surrounding the uses of genes and DNA. Throughout this guide, the authors try to provide a relatively unbiased assessment, giving both positive and negative perspectives, of the political and cultural environments that influence the progression of this field. This includes the rise of industrial interest and investment in gene technology, the potential to patent human genes and how these aspects have affected academic research. From the human genome

project, the book moves to evolution, discussing the ideas of natural selection, dominant and recessive traits, alleles and founder effects. This allows for a smooth transition to the next section entitled "Genes, Health and Behavior", which addresses a wide variety of issues including inherited genetic diseases, chromosomal abnormalities, the effects of environmental factors on our genes, ageing, cancer, and how much our genes affect our behaviour. The fourth section, "Genetic Technologies", delves into the more controversial issues for the general public. These chapters focus on the public perception, the scientific reality, and the potential uses of genetically modified organisms (GMOs), discussing the controversies behind GM food in Europe and North America. The potential of GMOs to help or harm in developing nations and the responsibilities of industry and governments are also addressed. Understandably, ethical issues are central to these discussions. This section not only focuses on GMOs, but also introduces the readers to the

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topics of cloning, somatic cell nuclear transfer (SCNT), the likelihood of creating "designer babies" (together with arguments for and against), and the use of genes and genetic signatures for "DNA detective work" in solving crimes and in paternity suits.

A guide to genes and cloning would not be complete without considering the topic of stem cells, specifically embryonic stem cells, and this is discussed in the fifth section of the book. This section explains how embryonic stem cells differ from somatic stem cells and discusses the usefulness of both types of cells in medicine. The authors also consider the prospect of personalized health care in which medical treatment would be tailored according to each person's genetic make-up. The guide ends by discussing the future of genetics and gene cloning, focusing on how bioethics, government regulation and the roles of non-governmental groups are affecting the direction of these fields. This section also explores how popular culture influences public perception of issues surrounding genes and cloning. At the end of the section the authors provides a list of further reading (both fictional and scientific material), films and websites for access of information online.

Overall, *The Rough Guide to Genes and Cloning* is an interesting and informative guide, useful for the lay person seeking an introduction to these topics. Written in non-technical language and not overwhelmingly detailed, this book is a good read for anyone interested in genetics but lacking a basic understanding of the field and just as good a read for the expert, in providing perspective. It will certainly be included in our list of "suggested reading" for students and colleagues at our institution interested in the field of stem cells.

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