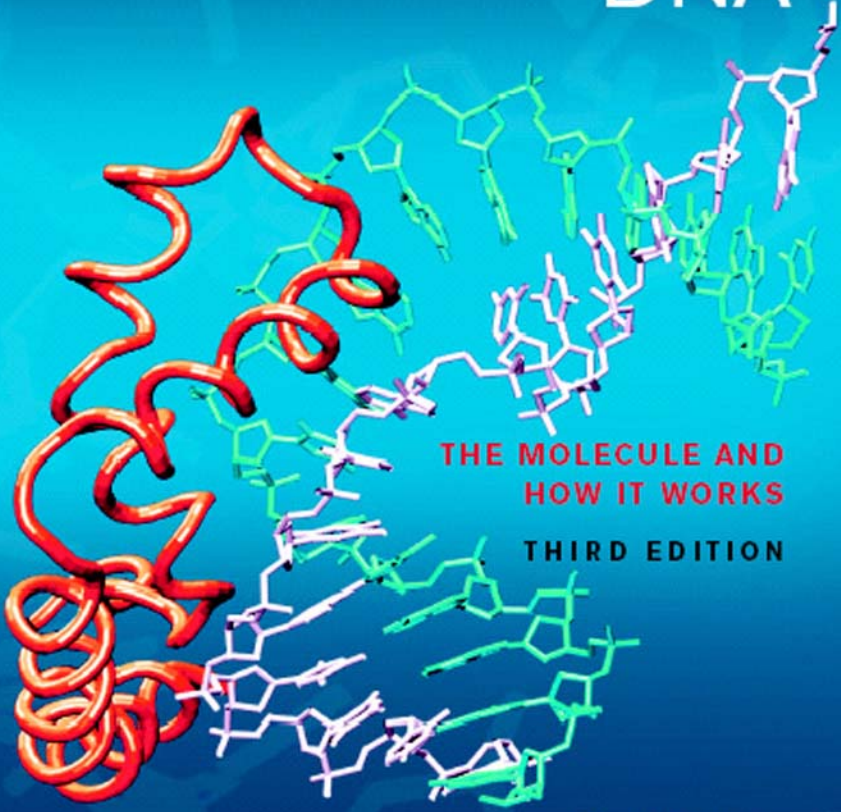
Understanding DNA



THE MOLECULE AND HOW IT WORKS

THIRD EDITION

Chris R Calladine
Horace R Drew
Ben F Luisi
Andrew A Travers

UNDERSTANDING DNA

The Molecule & How It Works

Third Edition

From reviews of earlier editions

A systematic and comprehensive analysis of the structure of DNA from a wonderfully fresh perspective. The book is a systematic effort to understand this fascinating molecule from the inside out, building from the first, and simplest, principles …. I recommend it very highly.
Trends in Genetics

We see DNA structures so often that it is often taken for granted that the molecule should not be anything but an aesthetically appealing, spiraling helix. But why should it assume such a nice structure? The book offers an absolutely delightful answer to this and other similarly mischievous questions. 'Understanding DNA' is a great book that will surely prove to be a valuable teaching tool.
The Biochemist

Among the strengths of the book are the clarity of the explanations of some quite difficult concepts and the novel way in which certain ideas are treated, perhaps causing the reader to think again about certain aspects of DNA structure. I enjoyed reading this book and would encourage colleagues working in the general area of DNA research to read it.
Heredity

Stylish … beautifully crafted, with a logical step-by-step approach to the subject. A book from which the advanced undergraduate will benefit, and which will also generate a refreshing perspective for experts.
Nature

Authoritative and lucid.
Aaron Klug

UNDERSTANDING DNA

The Molecule & How It Works

Third Edition

by

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The cover picture shows a complex between a protein called 'HMG-D' from fly chromosomes, and a particular sequence of DNA to which it binds strongly.

The two strands of double-helical DNA are shown in white and yellow respectively, while the protein is shown with less detail in red.

The strongly curved and untwisted structure of DNA in this complex illustrates our modern understanding of the molecule's biological action, in terms of its three-dimensional structure, which may be recognized and bound specifically by a regulatory protein.

Thus the DNA structure itself contains important information, in addition to the well-known one-dimensional Genetic Code written in the sequence of bases A, T, C and G.

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Contents

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About the authors

Chris Calladine is Emeritus Professor of Structural Mechanics at the University of Cambridge. In addition to researching many aspects of structural engineering, he has applied the methods of structural mechanics to the study of bacterial flagella, DNA and proteins.

Horace Drew solved several of the first DNA crystal X-ray structures with Richard Dickerson at Caltech, and subsequently spent 5 years researching DNA and chromosome structures with Aaron Klug at the MRC Laboratory of Molecular Biology in Cambridge, England. He now lives in Australia and is a Principal Research Scientist at CSIRO Molecular Science, Sydney Laboratory.

Ben Luisi studied hemoglobin structure with Max Perutz in Cambridge, and protein–DNA interactions with Paul Sigler at Yale University. He is a Wellcome Trust Senior Fellow in the Department of Biochemistry, University of Cambridge.

Andrew Travers is a staff scientist at the MRC Laboratory of Molecular Biology in Cambridge, England. He has studied transcriptional control in bacteria and flies, the wrapping of DNA in nucleosomes, and the role of HMG proteins in cells.