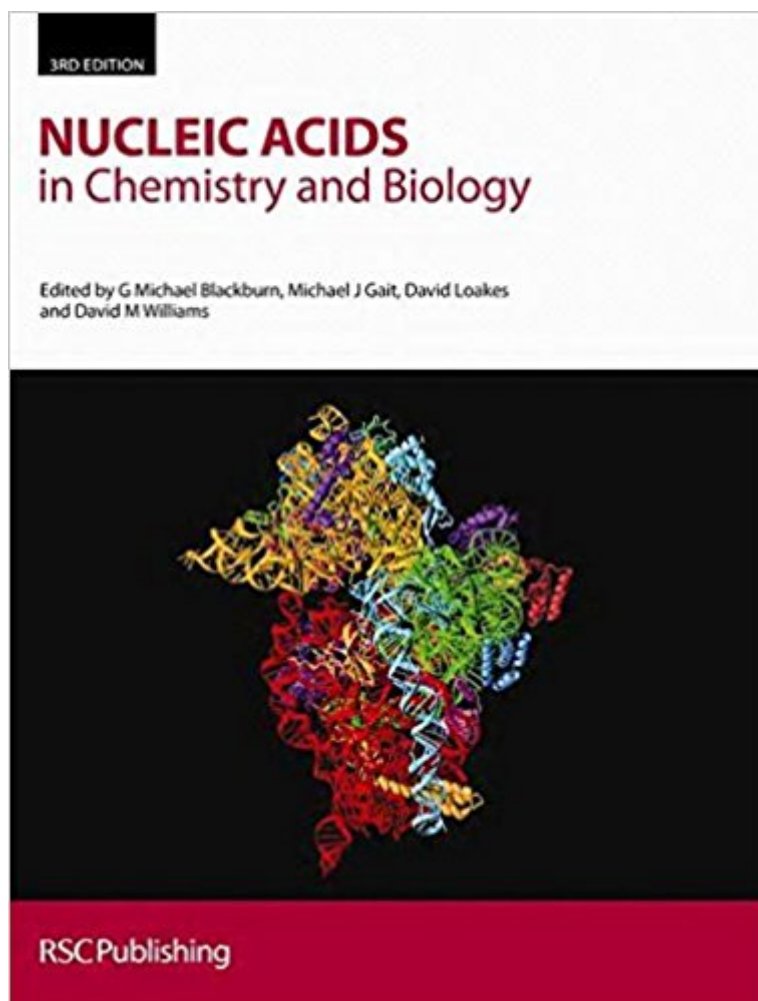


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Nucleic Acids In Chemistry And Biology: RSC



Synopsis

The structure, function and reactions of nucleic acids are central to molecular biology and are crucial for the understanding of complex biological processes involved. Revised and updated Nucleic Acids in Chemistry and Biology 3rd Edition discusses in detail, both the chemistry and biology of nucleic acids and brings RNA into parity with DNA. Written by leading experts, with extensive teaching experience, this new edition provides some updated and expanded coverage of nucleic acid chemistry, reactions and interactions with proteins and drugs. A brief history of the discovery of nucleic acids is followed by a molecularly based introduction to the structure and biological roles of DNA and RNA. Key chapters are devoted to the chemical synthesis of nucleosides and nucleotides, oligonucleotides and their analogues and to analytical techniques applied to nucleic acids. The text is supported by an extensive list of references, making it a definitive reference source. This authoritative book presents topics in an integrated manner and readable style. It is ideal for graduate and undergraduates students of chemistry and biochemistry, as well as new researchers to the field.

Book Information

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Customer Reviews

AT THE HEART OF MOLECULAR BIOLOGY Nucleic acids in chemistry and biology – Michael Blackburn, Michael Gait, David Loakes and David Williams (eds) Cambridge, UK: The Royal Society of Chemistry | 2006 | 470pp | ISBN 9780854046546 – Reviewed by Richard Bowater
Through the DNA double helix, the structures of nucleic acids touch the scientific consciousness of

scientists involved in many aspects of contemporary biological science. One reason for the iconic nature of this structure is the elegant explanations it provides for DNA metabolism. This clear biological relevance means that it can be easy to forget that these cellular processes are driven by basic chemical principles. The same laws of chemistry also apply to other forms of nucleic acids, such as RNA, though the biological functions of different classes of these molecules are extremely diverse. This book provides an excellent reminder of how studies into the basic chemistry of these various molecules have helped the understanding of their biological functions. The earlier two editions of this book (published by Oxford University Press) earned respect through their authoritative style, and this new edition from the RSC retains the successful format. It is 10 years since the previous edition, and research into nucleic acids has been particularly active during that time. The book contains a useful glossary of nucleic acid terminology, many useful references for further reading and figures to aid understanding of the principles under discussion. Good aspects from the previous edition are retained, including the introductory short historical overview of biological and chemical studies of nucleic acids. Three chapters cover the use of nucleic acids in biotechnology; genes and genomes; and RNA structure and function. It is these chapters that highlight the recent massive impact of this topic on biology and biotechnology, noticeably through the publication of large numbers of genome sequences and the recognition that RNA has many diverse functions within cells. Chemical aspects of nucleic acids come to the fore in the last third of the book, with description of interactions of small molecules with nucleic acids, protein-nucleic acid interactions and techniques used to analyse nucleic acids. In summary, this book provides an excellent overview of the chemistry and biology of nucleic acids, at a level that is suitable for use in university teaching, but with enough detail to be useful as a reference source for chemists, biochemists and biologists involved in current research of nucleic acids.

As the title indicates, the book has broad coverage of many facets of nucleic acids. It serves well as a textbook by introducing basic materials in a larger scope other than in depth. Some critics may address the issue that there are not enough details in some chapters, for example, Chapter 11, where physical methods are summarized. It can be argued, however, that its role as a textbook does not allow or need such details. The references should fill the gap given the fact that the students should have chemistry and biology background and be able to read further references. The glossary at the beginning is well organized for students to adopt the terminology. The subject index gives enough details for easy searching. The contents are rich in information. The references are very much up-to-date and carefully selected to reflect their impact in the fields. The colored figures

are very well designed and deliver on the point. The bold font of some text gives a strange untidy impression. The titles may have gone unnecessarily too far in levels, for example: 4.2.1.2.2. The color of those titles takes some neatness away from the pages. The authors / publisher maintain a good website where corrections are made to the book. The book covers the chemistry of nucleic acids and its components impressively well in different chapters. It will help readers to get a sound understanding of the chemistry, its implications, consequences and applications. The typical synthetic methods of nucleoside, nucleotide and oligonucleotide analogues are presented clearly with appropriate examples. Nicely covered are also the chemical properties and reactions of these species and nucleic acids. The biotechnology and genomic science are delivered in a very readable way even for a chemist. Very often there are chemical principles behind these applications: DNA sequencing, drug binding to DNA, DNA-protein interaction, DNA intercalation, and many, many more. Overall this is an outstanding textbook for graduate students as well as industrial researchers. It almost exclusively outlines the science of nucleic acids with good references from which interested readers can further their readings.

After chapter five, much of the then "current" procedures are no longer industry/lab standard. Would make a good undergrad book if that was what it was intended to be used for. As a grad level or above, a new addition is in order.

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