



Chemistry and Biology of Artificial Nucleic Acids

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This is the first book to provide a comprehensive overview of the field of artificial nucleic acids. Covering a tremendous amount of literature on the chemistry, biology, and structure of artificial nucleic acids, it will constitute an invaluable source of information for the specialist and for young researchers interested in starting a career in this fascinating field of research alike.

This book combines the contributions of many of the major players in this research field, and covers the synthesis of sugar-, base- and backbone-modified nucleic acids, their structural characteristics studied by X-ray crystallography, and NMR in solution as well as their chemical and biological properties.

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Editorial Review

From the Back Cover

Thirty years of investigations on the chemistry and biology of non-natural nucleic acids have provided us with a wealth of new information, ranging from a deeper understanding of the parameters that influence nucleic acids with cellular factors. There is no part of the nucleic acid structure that has not been touched by chemists, and every chemical modification has resulted in an altered property. The nucleic acid structure, as originally defined by the *Watson-Crick* double helix, has now been expanded into an entire landscape of new structures adopted by artificial pairing systems. Countless strategies have been developed for the chemical synthesis of these modified nucleic acids. The resulting polymers have found applications in diagnostics, therapeutics, biotechnology, catalysis, sequencing, and nanotechnology, and have had a major impact in the quest for a better understanding of the origin of life. There is hardly another area in bioorganic chemistry that has contributed so much to progress in biology throughout the last decades.

This book combines the contributions of many of the major players in this research field, and covers the synthesis of sugar-, base-, and backbone-modified nucleic acids, their structural characteristics studied by X-ray crystallography, and NMR in solution as well as their chemical and biological properties.

About the Author

Martin Egli studied chemistry and received his doctorate in organic chemistry and chemical crystallography at the Swiss Federal Institute of Technology (ETH) in Zürich, Switzerland. He has conducted research on the structure and function of native and artificial nucleic acids at the ETH, MIT, and Northwestern University, and currently holds an appointment as Professor of Biochemistry in the School of Medicine at Vanderbilt University, Nashville, Tennessee, USA.

Piet Herdewijn is Professor at the Katholieke Universiteit Leuven, Belgium, and head of the laboratory of medicinal chemistry at the Rega Institute. He obtained his Ph.D. and habilitation from the same university. He was a postdoctoral fellow of the Humboldt Foundation at the University of Konstanz. He has conducted research in bioorganic and medicinal chemistry, mainly in the field of nucleosides, nucleotides, and nucleic acids, at the University of Leuven, the University of Ghent, and the Université d'Evry-Val-d'Essonne.

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