

# Synthesis of Therapeutic Oligonucleotides

Satoshi Obika • Mitsuo Sekine  
Editors

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 Springer

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# Preface

Nucleic acids have been unambiguously recognized as potential resources for the development of new drugs to treat incurable genetic diseases, as well as functional materials for various applications in bioscience and biotechnology fields. In 2016, a new academic society, the Nucleic Acids Therapeutics Society of Japan, was inaugurated. This society was established based on a previous domestic organization, the Antisense Symposium. In addition, the Society of Nucleic Acids Chemistry was established in 2017 in Japan. During this time, organic chemistry of nucleic acids has gained importance in providing new drugs and materials. In Japan, we have a long history of nucleic acid chemistry studies. The first symposium on this subject was held at Osaka University in 1973 by the late Professor Morio Ikehara. Japan is unique in that large amounts of nucleic acids are produced as by-products of soy sauce and pulp. Therefore, many researchers working in biotechnology companies and universities have actively studied the utilization of such easily accessible natural products for a long period of time. As a result, Japan is one of the world's leading countries in nucleic acid chemistry research.

This book contains the latest research from active researchers in the nucleic acid chemistry field in Japan. Part I reviews recent developments in chemical synthesis of DNA and RNA oligomers and includes practical applications such as large-scale synthesis of DNA and RNA fragments. Part II summarizes new strategies for the synthesis of oligonucleotides modified at the nucleobases, sugar moieties, and phosphodiester linkages; these changes have been developed to improve their original properties such as hybridization affinity for DNA and RNA, as well as resistance to nucleases. The topics discussed in this book would be beneficial to those who want to join nucleic acid chemistry research or to discover more effective nucleic acid drugs in the future. We hope that this book may provide an opportunity for researchers to gain new understanding and inspire new ideas in nucleic acid chemistry research that may eventually lead to novel concepts and techniques.

Suita, Japan  
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January 20, 2018

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