

# Contents

<b>RNA as Major Components in Chemical Evolvable Systems . . . . .</b>	<b>1</b>
Peter Strazewski	
<b>How the Early Genetic Code Was Established?: Inference from the Analysis of Extant Animal Mitochondrial Decoding Systems . . . . .</b>	<b>25</b>
Kimitsuna Watanabe and Shin-ichi Yokobori	
<b>Isomerization of RNA Phosphodiester Linkages . . . . .</b>	<b>41</b>
Harri Lönnberg	
<b>Effects of Ionic Liquid and Liposomes on the Structure, Stability, and Function of Nucleic Acids . . . . .</b>	<b>57</b>
Naoki Sugimoto	
<b>Oxidative Damage on RNA Nucleobases . . . . .</b>	<b>75</b>
Pascal A. Küpfer and Christian J. Leumann	
<b>Use of FRET to Study Dynamics of DNA Replication . . . . .</b>	<b>95</b>
Philip Nevin and Penny J. Beuning	
<b>Design, Characterization, and Application of Imidazopyridopyrimidine:Naphthyridine Base-Pairing Motifs Consisting of Four Hydrogen Bonds . . . . .</b>	<b>113</b>
Noriaki Minakawa and Akira Matsuda	
<b>Creation of Unnatural Base Pair Systems Toward New DNA/RNA Biotechnologies . . . . .</b>	<b>131</b>
Michiko Kimoto and Ichiro Hirao	
<b>Flexible Nucleobase Analogues: Novel Tools for Exploring Nucleic Acids . . . . .</b>	<b>149</b>
Sarah C. Zimmermann and Katherine L. Seley-Radtke	

<b>Sequence-Selective Recognition of Double-Stranded RNA . . . . .</b>	<b>167</b>
Eriks Rozners	
<b>Determining Transient Nucleic Acid Structures by NMR . . . . .</b>	<b>181</b>
Jeetender Chugh	
<b>Diastereomer-Specific Repertoire of 7'R- or 7'S-Me-Carba-Locked Nucleic Acids (cLNAs) in Antisense Oligo/RNA Duplexes and Engineering of Physico-chemical and Enzymological Properties . . . . .</b>	<b>199</b>
Qing Li, Oleksandr Plashkevych, Ram Shankar Upadhyaya, Sachin Gangadhar Deshpande, Andras Földesi, and Jyoti Chattopadhyaya	
<b>Challenges and Opportunities for Oligonucleotide-Based Therapeutics by Antisense and RNA Interference Mechanisms . . . . .</b>	<b>227</b>
Ramon Eritja, Montserrat Terrazas, Santiago Grijalvo, Anna Aviñó, Adele Alagia, Sónia Pérez-Rentero, and Juan Carlos Morales	
<b>Progress in Chemically Modified Nucleic Acid Aptamers . . . . .</b>	<b>243</b>
Masayasu Kuwahara	
<b>Aptamers as Molecular Smugglers . . . . .</b>	<b>271</b>
Eileen Magbanua and Ulrich Hahn	
<b>Biochemical Aspects of Subcellular RNA Transport and Localization . . . . .</b>	<b>293</b>
Diana Bauermeister, Maike Claußen, and Tomas Pieler	
<b>Small Size, Big Impact: Bacterial Functional Nucleic Acids and Their Applications . . . . .</b>	<b>309</b>
Wendy W.K. Mok, Simon A. McManus, and Yingfu Li	
<b>Towards Defined DNA and RNA Delivery Vehicles Using Nucleic Acid Nanotechnology . . . . .</b>	<b>325</b>
Anders Hauge Okholm, David Schaffert, and Jørgen Kjems	
<b>Targeted Editing of Therapeutic Genes Using DNA-Based Transcriptional Activators: Scope and Challenges . . . . .</b>	<b>347</b>
Ganesh N. Pandian and Hiroshi Sugiyama	
<b>Interaction of DNA Intramolecular Structures with Their Complementary Strands: A Thermodynamic Approach for the Control of Gene Expression . . . . .</b>	<b>367</b>
Irine Khutsishvili, Sarah E. Johnson, Calliste Reiling, Iztok Prislan, Hui-Ting Lee, and Luis A. Marky	
<b>Site-Directed Spin Labeling of RNA for Distance Measurements by EPR . . . . .</b>	<b>385</b>
Joachim W. Engels, Christian Grünewald, and Lena Wicke	

<b>Chemo-enzymatic Strategies to Modify RNA in vitro or in Living Cells . . . . .</b>	409
Daniela Schulz and Andrea Rentmeister	
<b>Metal Dependence of Ligand Binding and Heavy-Atom Derivatization of Evolutionarily Distinct PreQ<sub>1</sub> Riboswitches . . . . .</b>	423
Joseph E. Wedekind, Joseph A. Liberman, Jermaine L. Jenkins, and Mohammad Salim	
<b>DNA G-Quadruplexes and I-Motifs in Therapeutics and Diagnostics . . . . .</b>	441
Yogini P. Bhavsar-Jog, Samantha M. Reilly, and Randy M. Wadkins	
<b>Peptides Targeting G-Quadruplex Structures . . . . .</b>	459
Kenji Usui and Arisa Okada	
<b>Synthesis of Site-Specifically Modified Long-mer RNAs . . . . .</b>	477
Darko Balke, Jennifer Frommer, Nico Rublack, Danilo Springstubb, Bettina Appel, and Sabine Müller	
<b>Synthesis and Exon-Skipping Activity of Chemically Modified RNAs . . . . .</b>	497
Yoshiaki Masaki, Takeshi Yamada, Hisao Saneyoshi, Akihiro Ohkubo, Kohji Seio, and Mitsuo Sekine	
<b>mRNA and snRNA Cap Analogs: Synthesis and Applications . . . . .</b>	511
Janusz Stepinski and Edward Darzynkiewicz	
<b>Innovative Chemistry for Synthesis of Regular RNA, 5'-Triphosphate RNA, or 5'-Capped RNA . . . . .</b>	563
Yann Thillier, François Morvan, Jean-Jacques Vasseur, and Françoise Debart	
<b>Index . . . . .</b>	591



<http://www.springer.com/978-3-642-54451-4>

Chemical Biology of Nucleic Acids

Fundamentals and Clinical Applications

Erdmann, V.A.; Markiewicz, W.T.; Barciszewski, J. (Eds.)

2014, XI, 599 p. 231 illus., 84 illus. in color., Hardcover

ISBN: 978-3-642-54451-4