

Contents

1 RNA 3D Structural Motifs: Definition, Identification, Annotation, and Database Searching	1
Lorena Nasalean, Jesse Stombaugh, Craig L. Zirbel, and Neocles B. Leontis	
2 Theory of RNA Folding: From Hairpins to Ribozymes	27
D. Thirumalai and Changbong Hyeon	
3 Thermodynamics and Kinetics of RNA Unfolding and Refolding	49
Pan T.X. Li and Ignacio Tinoco	
4 Ribozyme Catalysis of Phosphodiester Bond Isomerization: The Hammerhead RNA and Its Relatives	73
William G. Scott	
5 The Small Ribozymes: Common and Diverse Features Observed Through the FRET Lens	103
Nils G. Walter and Shiamalee Perumal	
6 Structure and Mechanism of the <i>glmS</i> Ribozyme.....	129
Juliane K. Soukup and Garrett A. Soukup	
7 Group I Ribozymes as a Paradigm for RNA Folding and Evolution	145
Sarah A. Woodson and Seema Chauhan	
8 Group II Introns and Their Protein Collaborators	167
Amanda Solem, Nora Zingler, Anna Marie Pyle, and Jennifer Li-Pook-Than	
9 Understanding the Role of Metal Ions in RNA Folding and Function: Lessons from RNase P, a Ribonucleoprotein Enzyme	183
Michael E. Harris and Eric L. Christian	

10 Beyond Crystallography: Investigating the Conformational Dynamics of the Purine Riboswitch	215
Colby D. Stoddard and Robert T. Batey	
11 Ligand Binding and Conformational Changes in the Purine-Binding Riboswitch Aptamer Domains.....	229
Jonas Noeske, Janina Buck, Jens Wöhnert, and Harald Schwalbe	
12 The RNA–Protein Complexes of <i>E. coli</i> Hfq: Form and Function	249
Taewoo Lee and Andrew L. Feig	
13 Assembly of the Human Signal Recognition Particle	273
Elena Menichelli and Kiyoshi Nagai	
14 Forms and Functions of Telomerase RNA	285
Kathleen Collins	
15 Ribosomal Dynamics: Intrinsic Instability of a Molecular Machine.....	303
Haixiao Gao, Jamie LeBarron, and Joachim Frank	
16 Biophysical Analyses of IRES RNAs from the <i>Dicistroviridae</i>: Linking Architecture to Function.....	317
Jeffrey S. Kieft	
17 Structure and Gene-Silencing Mechanisms of Small Noncoding RNAs.....	335
Chia-Ying Chu and Tariq M. Rana	
Index.....	357
Color Plates.....	365