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and Cofactors in Aptamer Evolution; 3.1 Introduction; 3.2 Functionality Landscapes Inferred from Examples; 3.2.1 Fitness Landscape; 3.2.2 Damage Selection Experiments with Ribozymes; 3.2.3 Construction of the Fitness Landscape; 3.2.3.1 Compatible Structure; 3.2.3.2 Mispairs; 3.2.3.3 Critical Sites; 3.2.3.4 Predicted Structure
3.2.4 Case Study: The Fitness Landscape of the *Neurospora* VS Ribozyme3.2.4.1 Compatible Structure of the VS Ribozyme; 3.2.4.2 Allowed Mispairs in the VS Ribozyme; 3.2.4.3 Critical Sites in the VS Ribozyme; 3.2.4.4 Predicted Structure for the VS Ribozyme; 3.2.4.5 Properties of the Estimated Fitness Landscape for the VS Ribozyme; 3.3 Error Thresholds Inferred from Functional Landscapes: The "Realistic" Error Threshold of the *Neurospora* VS Ribozyme; 3.4 Looking for Catalytic Partners: Cofactors and Aptamers; 3.4.1 Co-ribozymes (cofactor-assisted ribozymes); 3.4.2 Aptazymes
3.5 The Use of Coenzymes: From the RNA World to the Protein World via Translation and the Genetic Code3.6 Outlook; Acknowledgments; References; Part 2 In Vitro Selection of Target-binding Oligonucleotides; 4 Aptamers to Small Molecules; 4.1 Introduction; 4.2 Aptamers to Nucleotides/Nucleosides/Nucleobases; 4.3 Aptamers to Cofactors; 4.4 Aptamers to Amino Acids; 4.5 Aptamers to Carbohydrates; 4.6 Aptamers to Natural Products; 4.7 Aptamers to Organic or Fluorescent Dyes; 4.8 The Chimeric Approach for Aptamer Selection; 4.9 Conclusion; Acknowledgments; References; 5 Aptamers to Antibiotics
5.1 Introduction

Sommario/riassunto

In *The Aptamer Handbook*, leading scientists from academia as well as biotech and pharma companies introduce the revolutionary concept of designing RNA and DNA oligonucleotides with novel functions by in vitro selection. These functions comprise high affinity binding (aptamers), catalytic activity (ribozymes and deoxyribozymes) or combinations of binding and catalytic properties (aptazymes). Basic concepts and technologies describing in detail how these functional oligonucleotides can be identified are presented. Numerous examples demonstrate the versatility of in vitro selected oligonucleot
