

Contents

Preface	page ix
1 The genetic information system	1
2 James Watson, Francis Crick, George Gamow, and the genetic code	8
3 The Central Dogma of molecular biology	20
4 The measure of the information content in the genetic message	27
5 Communication of information from the genome to the proteome	33
6 The information content or complexity of protein families	57
7 Evolution of the genetic code and its modern characteristics	93
8 Haeckel's <i>Urschleim</i> and the role of the Central Dogma in the origin of life	114
9 Philosophical approaches to the origin of life	149
10 The error catastrophe and the hypercycles of Eigen and Schuster	158
11 Randomness, complexity, the unknowable, and the impossible	164
12 Does evolution need an intelligent designer?	176
13 Epilogue	182

Mathematical appendix	191
Glossary	213
References	219
Index	251

Contents

Preface	ix
1 The genetic information system	1
2 James Watson, Francis Crick, George Gamow, and the genetic code	8
3 The Central Dogma of molecular biology	20
4 The measure of the information content in the genetic message	27
5 Communication of information from the genome to the proteome	33
6 The information content or complexity of protein families	57
7 Evolution of the genetic code and its modern characteristics	93
8 Haeckel's 'biogenese' and the role of the Central Dogma in the origin of life	114
9 Philosophical approaches to the origin of life	159
10 The error catastrophe and the hypercycles of Eigen and Schuster	158
11 Randomness, complexity, the unknowable, and the impossible	164
12 Does evolution need an intelligent designer?	176
13 Epilogue	183