

CONTENTS

I SIMPLE INORGANIC MOLECULES TO COMPLEX FREE-LIVING CELLS

	Introduction	3	
	WALD	1	The Origin of Life 10
	SCHOPF	2	The Evolution of the Earliest Cells 20
MOROWITZ AND TOURTELLOTTE	3	The Smallest Living Cells 37	
MAZIA	4	The Cell Cycle 46	

II PROTEIN STRUCTURE AND FUNCTION: ASSEMBLY OF VIRUSES AND RIBOSOMES

	Introduction	59	
	PHILLIPS	5	The Three-Dimensional Structure of an Enzyme Molecule 67
	KOSHLAND	6	Protein Shape and Biological Control 81
WOOD AND EDGAR	7	Building a Bacterial Virus 95	
BUTLER AND KLUG	8	The Assembly of a Virus 106	
NOMURA	9	Ribosomes 114	

III MEMBRANE STRUCTURE AND CELLULAR ENERGETICS

	Introduction	125	
	CAPALDI	10	A Dynamic Model of Cell Membranes 130
LODISH AND ROTHMAN	11	The Assembly of Cell Membranes 138	
HINKLE AND MCCARTY	12	How Cells Make ATP 154	
MILLER	13	The Photosynthetic Membrane 170	

IV NUCLEIC ACID STRUCTURE: EXPRESSION OF THE GENETIC MESSAGE

	Introduction	182	
	BEADLE	14	The Genes of Men and Molds 188
	BENZER	15	The Fine Structure of the Gene 198
	CRICK	16	The Genetic Code 212
YANOFSKY	17	Gene Structure and Protein Structure 220	
RICH AND KIM	18	The Three-Dimensional Structure of Transfer RNA 231	
MANIATIS AND PTASHNE	19	A DNA Operator-Repressor System 242	

V REPLICATION, PRESERVATION, AND MANIPULATION OF DNA

		Introduction	253	
MIRSKY	20	The Discovery of DNA	262	
KORNBERG	21	The Synthesis of DNA	270	
CAIRNS	22	The Bacterial Chromosome	281	
DEVORET	23	Bacterial Tests for Potential Carcinogens	290	
CAMPBELL	24	How Viruses Insert Their DNA into the DNA of the Host Cell	300	
COHEN AND SHAPIRO	25	Transposable Genetic Elements	311	
COHEN	26	The Manipulation of Genes	321	
		Name Index	331	
		Subject Index	335	

Note on cross-references to SCIENTIFIC AMERICAN articles: Articles included in this book are referred to by title and page number; articles not included in this book but available as Offprints are referred to by title and offprint number; articles not included in this book and not available as Offprints are referred to by title and date of publication.