

CONTENTS

PREFACE	v
PART I. GEOMETRY AND ACTION IN VIRUSES	1
Chapter 1. Early Theories of Virus Structure <i>Gregory J. Morgan</i>	3
Chapter 2. Quasi-Equivalence and Adaptability in Living Molecular Assemblies <i>Donald L. Caspar and Lena Hammar</i>	41
Chapter 3. The Role of Disordered Segments in Viral Coat Proteins <i>Lars Liljas</i>	53
Chapter 4. Prefusion Dynamics in an Enveloped Virus – Alphavirus Model <i>Lena Hammar, Lars Haag, Bomu Wu and R. Holland Cheng</i>	78
PART II. APPROACHING LARGE ASSEMBLIES IN MEMBRANES	109
Chapter 5. Strategy to Obtain High Resolution Structure of Membrane Proteins by X-ray Crystallography <i>Hiroshi Aoyama, Eiki Yamashita, Keisuke Sukarai and Tomitake Tsukihara</i>	111
Chapter 6. On the Possibility of Determining Structures of Membrane Proteins in Two-Dimensional Crystals Using X-Ray Free Electron Lasers <i>Michael Becker and Edgar Weckert</i>	133

Chapter 7.	Functional Details on Membrane Proteins Observed Through an Electron Beam	148
	<i>Yoshinori Fujiyoshi</i>	
PART III.	PROTEIN SHUTTLE	159
Chapter 8.	Clathrin and Companions	161
	<i>Barbara Pearse</i>	
PART IV.	GIANT ENZYMES	169
Chapter 9.	Multifunctional Enzyme Complexes: Multistep Catalysis by Molecular Machines	171
	<i>Richard N. Perham</i>	
Chapter 10.	Metamorphosis of an Enzyme	198
	<i>Rudolf Ladenstein, Winfried Meining, Xiaofeng Zhang, Markus Fischer and Adelbert Bacher</i>	
Chapter 11.	Optimizing an Enzyme for Its Physiological Role: Structural and Functional Comparisons of ATP Sulfurylases from Three Different Organisms	222
	<i>Andrew J. Fisher, Ian J. Macrae, John D. Beynon, Eric B. Lansdon and Irwin H. Segel</i>	
PART V.	RIBOSOMES	243
Chapter 12.	Ribosomal Crystallography: Dynamics, Flexibility and Peptide Bond Formation	245
	<i>Ada Yonath</i>	
Chapter 13.	The Dynamics of the Ribosome as Inferred by Cryo-EM: Induced and Self-Organized Motions	291
	<i>Joachim Frank</i>	

Chapter 14. How do Translation Factors Catalyze Protein Synthesis	307
<i>Martin Laurberg, Ole Kristensen, Maria Selmer, Xiao-Dong Su and Anders Liljas</i>	
PART VI. MOTION ENGINES	331
Chapter 15. Dynamic Aspects of the Bacterial Flagellum	333
<i>Keiichi Namba</i>	
Chapter 16. Myosin Polymorphism and Muscle Contraction	345
<i>Kenneth C. Holmes and Rasmus R. Schroeder</i>	
PART VII. AROUND THE BENCH PROTEOMICS	359
Chapter 17. Is Crystallization a “Bottleneck” of Modern Structural Crystallomic?	361
<i>Jan Sedzik</i>	
Chapter 18. Sensor Surface Interactions in the Study of Macromolecular Assemblies	379
<i>José M. Casasnovas, Sevak Markarian and Lena Hammar</i>	
Chapter 19. PPIDB — A Protein-Protein Interactions Database	391
<i>Prasanna R. Kolatkar and Lin Kui</i>	
Chapter 20. Virus Particle Explorer (VIPER): A Repository of Virus Capsid Structures	403
<i>Vijay S. Reddy, Padmaja Natarajan, Gabriel Lander, Chunxu Qu, Charles L. Brooks, III and John E. Johnson</i>	
Index	413