

Permeability of Biological Membranes

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Summary

The ultimate energy source for life on Earth is the solar energy of Sun. Cells convert the radiation energy to other types of energy. The major chemical energy produced by cells is ATP. In turn the energy needed for cellular work is provided by ATP, the energy currency of cells. Most of the chemical energy of ATP in cells is used for (i) mechanical work, (ii) biosynthetic processes, and (iii) transport by passing molecules and ions across the cell membranes to maintain concentration gradients.

By the analogy of “Space: the final frontier” (Star Track), the cell membrane is the living frontier of cells. However, the cell membrane is not quite the final frontier of cells due to their connection with the environment known as permeability. The cell membrane or cytoplasmic membrane and the intracellular membranes of organelles are biological membranes. The cytoplasmic membrane separates the cell from the outside environment and cells from each other. The intracellular membranes separate specialized subunits with specific function known as organelles. The cytoskeleton may form appendage-like organelles, such as cilia, lamellopodia and finger-like projections known as microvilli covered by cell membrane. The cell membrane is selectively permeable to organic molecules and ions. This book deals with biological membranes, focuses on the permeability of cells, on methods of permeabilization, with particular attention to the reversibility and applications of permeabilization.

Contents

1	Biological Membranes	1
1.1	Definition of Biological Membranes.....	2
1.2	Lipids.....	4
1.2.1	Fatty Acids	4
1.2.2	Glycerolipids	5
1.2.3	Storage of Fats in Trans-Differentiated Adipose Tissues.....	6
1.3	Major Lipids in Biological Membranes	8
1.3.1	Polyunsaturated Fatty Acids.....	8
1.3.2	Phospholipids	8
1.4	Steroids.....	15
1.4.1	Sterols.....	15
1.4.2	Cholesterol, Cholesterol Esters	16
1.5	Waxes	18
1.6	Amphipathic Molecules Forming Synthetic Bilayers	19
1.6.1	Synthetic Membranes, Artificial Cell Membranes	20
1.6.2	Artificial Cells	21
1.7	Lipid Membranes	22
1.7.1	Cytoplasm, Cytosol, Cytoskeleton	22
1.7.2	Fluid Mosaic Bilayer	23
1.7.3	Bacterial Membranes.....	25
1.7.4	Eukaryotic Supramembrane Structures	27
1.7.5	Endomembrane System: Membranes of Cellular Organelles	30
1.7.6	Vesicular Membranes	40
1.8	Function of Biological Membranes.....	41
1.8.1	Mechanical Function	41
1.8.2	Formation of Compartments	41
1.8.3	Function of Cytoskeleton	42
1.8.4	Extracellular Matrix	45
1.8.5	Selective Permeability	45

1.8.6	Specialization	45
1.8.7	Metabolic Activities of Membranes	47
1.8.8	Localization of Membrane Function	48
1.8.9	Regulation of Membrane Transport	49
1.8.10	Membrane Receptors.....	49
1.8.11	Cell Surface Markers.....	50
1.9	Cell-Cell Interaction.....	52
1.10	Membrane Potential	54
1.10.1	Energy Transduction	59
	References.....	62
2	Permeability of Membranes.....	73
2.1	Permeability of Biological Membranes	75
2.2	Transport and Signaling Across the Membrane.....	77
2.3	Permeability of Small Particles.....	77
2.4	Bilayer Permeability.....	78
2.5	Selectivity.....	79
2.6	Passive Transport Processes.....	79
2.6.1	Simple Diffusion	80
2.6.2	Osmosis	80
2.6.3	Filtration	81
2.6.4	Facilitated Diffusion.....	81
2.7	Protein Mediated Transport.....	82
2.7.1	Transport Systems	82
2.7.2	Channel Proteins	83
2.7.3	Ionophores.....	84
2.8	Types of Active Transport Processes	88
2.8.1	Primary Active Transport	88
2.8.2	Secondary Active Transport	91
2.9	Electrochemical Potential-Driven Transporters	91
2.9.1	Uniporters.....	92
2.9.2	Symporters	93
2.9.3	Antiporters.....	93
2.9.4	Non-ribosomally Synthesized Porters	94
2.10	ABC Transporters	94
2.11	Organellar Membrane Transport	95
2.12	Transmembrane Proteins.....	95
2.13	Macromolecular Membrane Transport.....	97
2.13.1	Targeting Biological Information	98
2.13.2	Nuclear Targeting	99
2.13.3	Protein Targeting to Peroxisomes.....	101
2.13.4	Targeting to Mitochondria.....	102
2.13.5	Targeting the Endomembrane System.....	105
2.13.6	Vesicular Transport in Protein Targeting.....	110

2.14	Bacterial Membranes	111
2.15	Chloroplast Membranes	113
2.15.1	Protein Targeting to Chloroplasts	114
2.16	Measurement of Membrane Permeability	116
2.16.1	Cytotoxicity Assays.....	116
	References.....	120
3	Methods of Permeabilization	129
3.1	Physical Methods	131
3.1.1	Electroporation	131
3.1.2	Electrofusion	132
3.1.3	Electroinjection	132
3.1.4	Microinjection	132
3.1.5	Transfection.....	133
3.1.6	Liposome-Mediated Delivery.....	133
3.1.7	Fusion of Red Cell Ghost	133
3.1.8	Cell-Penetrating Peptides	134
3.1.9	Osmotic Lysis of Picnocyctic Vesicles	134
3.1.10	Laser Pulses.....	135
3.1.11	Glass Beads	137
3.1.12	Cold Shock	138
3.1.13	Hypotonic Treatment.....	139
3.2	Pore Formation in Membranes.....	141
3.2.1	Major Intrinsic Proteins (MIPs)	141
3.2.2	ATP-Induced Pore Formation.....	143
3.2.3	Pore-Forming Proteins	144
3.2.4	Channelopathies	149
3.2.5	Streptolysin O Treatment	153
3.2.6	Coelenterazine Analogues.....	156
3.3	Organic Solvents	156
3.3.1	Alcohols (Methanol, Ethanol)	158
3.3.2	Acetone.....	162
3.3.3	Ether	162
3.3.4	Toluene Treatment.....	163
3.4	Mild Detergents.....	164
3.4.1	Digitonin.....	165
3.4.2	Saponin.....	166
3.4.3	Triton X100	169
3.4.4	Tween 20 and Tween 80	169
3.4.5	Brij Detergents	172
3.4.6	Lysolecithin	172
3.5	Enzymatic Digestion	173
3.5.1	Proteinase K	173

3.6	Agents Affecting Membrane Fluidity	174
3.6.1	Protective Agents on Membrane Fluidity.....	177
3.6.2	Fluidifying Effect on Plasma Membrane	178
3.7	Cryoprotectants	178
3.7.1	Penetrating Cryoprotectans	178
3.7.2	Impermeable Cryoprotectants	180
	References.....	182
4	Applications of Permeabilization.....	201
4.1	Polycations as Permeabilizing Agents	203
4.1.1	Cationic Contact-Killing	203
4.1.2	Polycation Gene Delivery Systems	203
4.1.3	Polyamins	204
4.1.4	Cationic Polyamino Acids.....	204
4.2	Anticancer Effect of Permeabilization	205
4.2.1	Anticancer Effect of Polycationic Peptides.....	205
4.2.2	Avicins.....	206
4.3	Delivery and Cellular Imaging of Quantum Dots	206
4.3.1	Toxicity of Quantum Dots.....	207
4.3.2	Functionalization of Quantum Dots	207
4.3.3	Bioimaging of Quantum Dots	207
4.3.4	Permeabilization to Introduce Quantum Dots.....	208
4.4	Cell-Cell Electrofusion.....	209
4.4.1	Hybridoma.....	210
4.4.2	Inhibition of Electrofusion by Propofol	210
4.5	Medical Applications of Hypo- and Hypertonic Solutions.....	211
4.6	Poly-ADP Ribosylation in Permeable Cells	212
4.7	DNA Synthesis in Permeable Cells.....	213
4.7.1	DNA Synthesis in Permeable Bacteria.....	214
4.7.2	Isolation and Analysis of Nascent Mercury-DNA Synthesized in Permeable Bacteria.....	216
4.7.3	Mechanism of RNA Primer Removal in <i>B. subtilis</i>	219
4.7.4	Nascent DNA Synthesized in Reversibly Permeabilized Murine Thymocytes.....	220
4.7.5	Measurement of Replicative and Repair DNA Synthesis in Permeable Cells.....	222
4.7.6	DNA Excreted by Stimulated Lymphocytes	226
4.7.7	Early Replicative Intermediates Shorter than Okazaki Fragments	227
4.8	Temporal Order of Gene Replication and Gene Expression in Permeable Cells.....	227
4.9	Visualization of Replicons in Reversibly Permeabilized Cells.....	233

4.10	Visualization of Intermediates of Chromosome Condensation Isolated from Nuclei of Reversibly Permeabilized Cells.....	234
4.10.1	Intermediates of Chromatin Condensation in CHO Cells	235
4.10.2	Chromatin Condensation in Resting, Tumor and Stem Cells	238
4.10.3	Chromatin Condensation in Regenerating Rat Liver Cells.....	238
4.10.4	Subunits of Metaphase Chromosomes	240
4.10.5	Comparison of Chromatin Condensation in Insect, Mollusc and Mammalian Cells.....	241
4.10.6	Linear and Spatial Arrangement of Chromosomes	243
4.10.7	Linear Order of Chromosomes.....	244
4.11	Heavy Metal Induced Chromatin Changes	245
4.11.1	Cadmium (II) Induced Chromatin Damages	245
4.11.2	Chromatin Toxicity of Lead(II).....	246
4.11.3	Cellular and Chromatin Toxicity of Nickel (II).....	246
4.11.4	Chromatin Changes Caused by HgCl ₂	249
4.11.5	Silver (I) Induced Chromatin Changes.....	249
4.12	Effect of Irradiation on Chromatin Structure	249
4.12.1	Cellular and Chromatin Alterations Generated by Gamma Irradiation	249
4.12.2	Chromatin Damages Caused by UV Irradiation	252
4.12.3	Chromatin Damages Generated by Alpha Irradiation	252
	References.....	254