

BEMC

Biochemistry part 1

PROTEINS

The structural elements and functions of proteins. The primary structure of proteins. Higher levels of protein structure. Fibrous and globular proteins. Collagen and Elastin. Proteins that bind and carry oxygen: myoglobin and hemoglobin. Albumin structure and function.

ENZYMES

General characteristics of enzymes. Enzyme kinetics. General mechanisms of enzymatic catalysis. Reversible inhibition of enzymes. Covalent and allosteric regulation of enzyme activity. Water-soluble vitamins, coenzymes and prosthetic groups: structure and function.

BIOLOGICAL MEMBRANES AND TRANSPORT SYSTEMS

The components of membranes. Molecular structure of membranes. Traffic of molecules across membranes. Membrane proteins: receptors, channels, pores, enzymes, transporters. The sodium pump (Na / K ATPase). The transport of glucose.

METABOLISM AND CELL ENERGY

Anabolic and catabolic pathways. Intermediary and terminal metabolism. Control of metabolism. Systems that produce and use energy. Thermodynamics of biochemical reactions. Energy-rich compounds. ATP as intermediate carrier of energy. Upload Power and Potential of phosphate.

GLUCOSE METABOLISM

digestion and absorption of carbohydrates. Glycolysis and Gluco(neo) genesis. Metabolism of glycogen. Control of glucose metabolism. Pentose-phosphate cycle. Metabolism of fructose and galactose. Biosynthesis of lactose glucuronic acid. Mucopolysaccharides.

CITRIC ACID CYCLE, AND RESPIRATORY CHAIN OXIDATIVE PHOSPHORYLATION

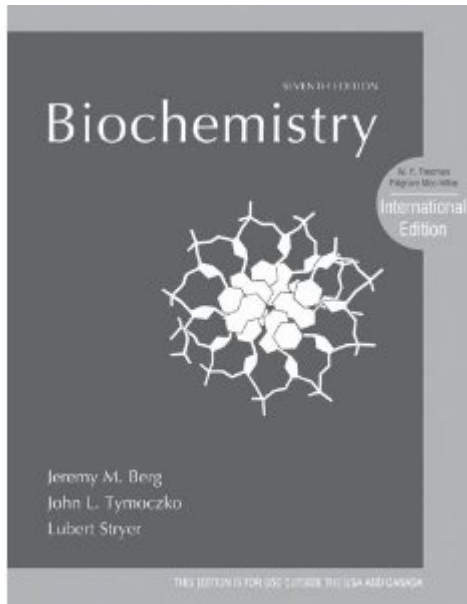
Amphibolic function of the cycle. Regulation of the citric acid cycle. Anaplerotic reactions. The biological oxido-reduction. The respiratory chain and its components. Regulation of cell respiration. Radical species and transfer of a single electron to oxygen. Coupling mechanism between generation and utilization of energy. The Oxidative Phosphorylation. The complex of ATP synthase.

METABOLISM OF LIPIDS

Digestion and absorption of lipids. Biosynthesis and degradation of triglycerides. Fatty acid oxidation. Formation and utilization of keton bodies. Biosynthesis of fatty acids and cholesterol. Biosynthesis of complex lipids. Degradation of Phospholipids. Arachidonic acid metabolism. Prostaglandins. Lipophylic vitamins.

METABOLISM OF AMINO ACIDS

Digestion and absorption of proteins. General reactions of amino acids. Glucogenic and ketogenic amino acids. Transamination. Oxidative deamination of glutamic acid. Transport of ammonia in the liver. Urea cycle. Decarboxylation of amino acids. The bioamines and their metabolism. Dehaldolization of Serine. Metabolism of Monocarbon Units. Folic Acid and Vitamin B12. Metabolism of methyonine. The Creatine / P-Creatine. Metabolism of Phenylalanine, Tyrosine and branched chain amino acids.



SUGGESTED BOOK

Biochemistry, 7th edition, 2011.

Edited by International Edition.

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HOURS FOR STUDENT RECEPTION

Tuesday, 16.00-19.00, at DSMB.