Metabolism and its Biomedical Significance

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Background:Metabolism-the entire network of chemical reactions carried out by living cells. Metabolism also includes coordination, regulation and energy requirement. Metabolites: small molecule intermediates in the degradation and synthesis of polymer. Metabolism is a term that is used to describe all chemical reactions involved in maintaining the living state of the cells and the organism. Metabolism can be conveniently divided into Catabolism (the breakdown of molecules to obtain energy) and Anabolism (the synthesis of all compounds needed by the cells). Energy formation is one of the vital components of metabolis. Metabolism is the entire network of chemical reactions carried out by living cells. Metabolites are the small molecules that are intermediates in the degradation or biosynthesis of biopolymers. The term intermediary metabolism is applied to the reactions involving these low-molecular-weight molecules. It is convenient to distinguish between reactions that synthesize molecules (anabolic reactions) and reactions that degrade molecules (catabolic reactions). Anabolic reactions: are those responsible for the synthesis of all compounds needed for cell maintenance, growth, and reproduction. These biosynthesis reactions make simple metabolites such as amino acids, carbohydrates, coenzymes, nucleotides, and fatty acids. They also produce larger molecules such as proteins, polysaccharides, nucleic acids, and complex lipids. In some species, all of the complex molecules that make up a cell are synthesized from inorganic precursors (carbon dioxide, ammonia, inorganic phosphates, etc.). Some species derive energy from these inorganic molecules or from the creation of membrane potential. Photosynthetic organisms use light energy to drive biosynthesis reactions. Catabolic reactions: degrade large molecules to liberate smaller molecules and energy. All cells carry out degradation reactions as part of their normal cell metabolism but some species rely on them as their only source of energy. Animals, for example, require organic molecules as food. The study of these energy-producing catabolic reactions in mammals is called fuel metabolism. The ultimate source of these fuels is a biosynthetic pathway in another species. Keep in mind that all catabolic reactions involve the breakdown of compounds that were synthesized by a living cell—either the same cell, a different cell in the same individual, or a cell in a different organism. There is a third class of reactions called amphibolic reactions. They are involved in both anabolic and catabolic pathways. Method: write ups and journals and various research done by various persons was used and articles on the Conclusion: Anabolic internet was also used and biochemistry textbooks by different authors pertaining to the topic. reactions use small molecules and chemical energy in the synthesis of macromolecules and in the performance of cellular work. Solar energy is an important source of metabolic energy in photosynthetic bacteria and plants. Some molecules, including those obtained from food, are catabolized to release energy and either monomeric building blocks or waste product.

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