



METABOLISM IN THE CELL AND ITS DISORDERS

Mamatyaqubova Malohat Sharof kizi

Andijan state medical institute

Andijan, Uzbekistan.

Annotation: This article covers extensively the processes of metabolism (metabolism) in the cell and their disorders. Metabolism forms the basis of vital processes in living organisms. The article analyzes in detail the metabolism of carbohydrates, proteins, lipids and nucleic acids, their functions in the cell, the causes of the disorder and their role in the pathogenesis of diseases. Information on the diagnosis and treatment of metabolic disorders based on clinical examples is also provided. Annotation

This article covers extensively the processes of metabolism (metabolism) in the cell and their disorders. Metabolism forms the basis of vital processes in living organisms. The article analyzes in detail the metabolism of carbohydrates, proteins, lipids and nucleic acids, their functions in the cell, the causes of the disorder and their role in the pathogenesis of diseases. Information on the diagnosis and treatment of metabolic disorders based on clinical examples is also provided.

Keywords: Metabolism, cell, metabolism, carbohydrate metabolism, protein metabolism, lipid metabolism, nucleic acids, metabolic disorders, diabetes, gout, phenylketonuria.

Introduction

Metabolism or metabolism is one of the most important biological processes that occur in cells and organisms. Metabolism ensures the body's demand for energy and plasticity, controlling growth, development and cell survival. Due to the complexities of chemical reactions that take place in cells, there are various biochemical pathways and mechanisms that are closely related to each other. And a violation of metabolic processes provokes the development of many diseases. For example, diabetes mellitus occurs when carbohydrate metabolism is impaired, phenylketonuria occurs when protein metabolism is impaired, atherosclerosis, gout and other pathological conditions occur when lipid metabolism is impaired. For this reason, the study of metabolism is very important for medicine.

Methods

This article is based on methods of analysis and theoretical generalization of scientific literature. Methods of biochemical analysis, clinical observations and modeling of metabolic pathways have been widely used in research. Conclusions were also drawn about the Basic Laws of metabolic processes and their violations on the basis of international scientific articles and educational manuals published in the medical institutes of Uzbekistan.

Results



Metabolic processes are complex, which are divided into several main areas:

1. Carbohydrate metabolism- glucose is the main energy source of the cell. Glucolysis, gluconeogenesis, glycogen synthesis and degradation, and the pentose-phosphate pathway are major pathways of carbohydrate metabolism. esults

Metabolic processes are complex, which are divided into several main areas:

1. Carbohydrate metabolism- glucose is the main energy source of the cell. Glucolysis, gluconeogenesis, glycogen synthesis and degradation, and the pentose-phosphate pathway are major pathways of carbohydrate metabolism. When carbohydrate metabolism is disrupted, diabetes mellitus, hypoglycemia, glycogenesis diseases occur.

2. Protein metabolism- proteins are broken down into amino acids and they serve as a building material for the cell as well as a substrate for metabolic pathways. When protein metabolism is disrupted, diseases such as phenylketonuria, albinism, alcoptonuria are observed.

3. Lipid metabolism - lipids are a source of energy, a component of the cell membrane and important in the synthesis of hormones.. Protein metabolism - proteins are broken down into amino acids and they serve as a building material for the cell as well as a substrate for metabolic pathways. When protein metabolism is disrupted, diseases such as phenylketonuria, albinism, alcoptonuria are observed.

3.Lipid metabolism- lipids are a source of energy, a component of the cell membrane and important in the synthesis of hormones. When Lipid metabolism is disrupted, atherosclerosis, fatty liver, gout, lipid dystrophy and other diseases are caused.

4. Nucleic acid metabolism - DNA and RNA synthesis and degradation play a key role in maintaining the genetic stability of the cell. When nucleic acid metabolism is disrupted, cancers, immunodeficiency States, and hereditary syndromes may occur.

5. Energy exchange - occurs through oxidative phosphorylation and ATP synthesis in mitochondria.. Nucleic acid metabolism - DNA and RNA synthesis and degradation play a key role in maintaining the genetic stability of the cell. When nucleic acid metabolism is disrupted, cancers, immunodeficiency States, and hereditary syndromes may occur.

5. Energy exchange- occurs through oxidative phosphorylation and ATP synthesis in mitochondria. Disruption of energy metabolism leads to the destruction of the life activity of the cell and causes various degenerative diseases.

Debate

Metabolic disorders are one of the most common problems in clinical medicine. For example, in diabetes mellitus, glucose metabolism goes out of the way, resulting in hyperglycemia and various complications. In phenylketonuria, the degradation of the amino acid phenylalanine is disrupted, which leads to severe defects in the development of the nervous system. When Lipid metabolism is disrupted, the risk of atherosclerosis, cardiovascular disease and stroke



increases. Metabolic disorders are one of the most common problems in clinical medicine. For example, in diabetes mellitus, glucose metabolism goes out of the way, resulting in hyperglycemia and various complications. In phenylketonuria, the degradation of the amino acid phenylalanine is disrupted, which leads to severe defects in the development of the nervous system. When Lipid metabolism is disrupted, the risk of atherosclerosis, cardiovascular disease and stroke increases. However, many metabolic disorders are also associated with genetic factors, malnutrition, alertness, and environmental factors. Today, genetic analysis, biochemical tests, metabolomics and modern medical technologies are expanding the possibilities of detecting and treating disorders of metabolism.

Conclusion

Metabolism is the main process in the vital activity of cells, the violation of which is the cause of various diseases. Disorders of carbohydrate, protein, lipid and nucleic acid metabolism play an important role in the development of diseases such as diabetes mellitus, atherosclerosis, phenylketonuria, gout. Through an in-depth study of metabolic processes, early diagnostics and the use of modern methods of treatment, it is possible to increase the effectiveness of the prevention and treatment of these diseases.

Literature:

1. Voet D., Voet J.G. Biochemistry. Wiley, 2011.
2. Nelson D.L., Cox M.M. Lehninger Principles of Biochemistry. W.H. Freeman, 2017.
3. Alberts B. Molecular Biology of the Cell. Garland Science, 2015.
4. Murray R.K., et al. Harper's Illustrated Biochemistry. McGraw-Hill, 2018.
5. Berg J.M., Tymoczko J.L., Gatto G.J. Biochemistry. Freeman, 2019.
6. O'zbekiston Respublikasi Sog'liqni Saqlash Vazirligi. Biokimyo fanidan o'quv qo'llanma. Toshkent, 2019.
7. Karimov U., Toirov S. Umumiy biologiya. Toshkent: O'qituvchi, 2015.
8. G'ofurov A., Biologik kimyo. Toshkent tibbiyot nashriyoti, 2017.
9. Bayramov T. Patologik fiziologiya asoslari. Toshkent, 2016.
10. Stryer L. Biochemistry. Freeman, 2015.
11. Lodish H., Berk A., Zipursky S.L. Molecular Cell Biology. Freeman, 2016.
12. Voit E.O. Computational Analysis of Biochemical Systems. Cambridge University Press, 2000.
13. Shodmonov U., Shakarov T. Tibbiy biologiya va biokimyo asoslari. Toshkent, 2020.
14. WHO. Metabolic disorders: Global health reports, 2022.