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Notice

Written by Prof. Dr. Emanuil Gachev PhD, DSc On the book "HUMAN FUNCTIONAL BIOCHEMISTRY" by Boris Popov, Simona Popova and Anna Tolekova, issued by Academic publishers, Trakia University in 2012

This book is the third revised and supplemented edition, with six completely new chapters for blood, urine and kidney, liver, nervous system and sense organs, muscles and connective and supporting tissue. The book has 308 pages, contains 124 illustrations and 48 tables. An alphabetical index of 1056 terms is applied to the book. Only 59 of the most important literature sources are enlisted in the Bibliography section.

In didactic terms the arrangement of the chapters is quite correct. The content of the book is arranged according to the following design: food → metabolism of various organs → cell differentiation → outside impacts on human body and related changes in the human organism → normal values of blood parameters. This manner of presentation is frequently used in a great number of European textbooks on Functional Biochemistry.

The textbook has 21 chapters divided into five sections, as follows.

1. Nutrition, mineral and water-salt balance (Chapters 1-5).

The first chapter deals with nutrition, nutrients and food products. It includes many tables for the content and chemical composition of foods. Much attention is paid to the fasting metabolism, obesity and susceptibility to obesity. Data presented for parenteral nutrition will be of practical value to future doctors.

Chapters 3-5 are devoted to water, electrolytes and minerals in the body. Some pathological changes are associated with deviations from the normal values of water content and ion distribution.

2. Biochemical processes in different organs and systems (Chapters 6-17).

Chapters 6 and 7 appear as logical extension of the previous chapters. Blood, hemoglobin and major hemoglobinopathies are treated in them. Without excessive details the main functions of the liver - metabolic, detoxication and bile formation are described in Chapter 9. Pathological changes are illustrated by two examples - for fatty infiltration and hepatitis.

Because of the recently accumulated new data on the metabolism of lung the authors have found it very appropriate to concentrate on that theme in a separate Chapter 10. Chapter 11 is devoted to the nervous system and sense organs. Here the synthesis, mechanism of action and metabolism of neurotransmitters are explained in brief. Attention is paid to Alzheimer's and Parkinson's diseases, which represent a serious social problem.

Chapter 12 introduces the reader to the muscles. The mechanism of muscle contraction is well described. Attention is also paid to the metabolism of muscles and how the physical exercise influences this metabolism. As examples of pathology in this area the muscular dystrophy and glycogenosis type V (McArdle disease) are pointed out.

In Chapter 13 authors have focused their attention to the biochemistry of heart and I find it well substantiated. Moreover, the metabolism of heart is interpreted at rest and during physical exercise as well as at ischemia.

Given the large overall biological and physiological significance of lactation I think the

biochemical data about this process, as presented in Chapter 14, will be particularly useful to the readers.

Chapter 15 is dedicated to supporting and connective tissue. The processes taking place in different cell types and the formation of intercellular substance are both explained here. The importance of factors affecting bone growth is well outlined.

The immune system is discussed in Chapter 17. Briefly described are the cellular and humoral immune responses. All types of immunoglobulins and their role in protecting the body are well described. The major histocompatibility complex is introduced. This chapter contains 9 illustrations and a table, which significantly facilitate the reader in learning the material.

3. Cellular differentiation and malignant tumors (Chapter 18).

Here the authors draw the attention to the main elements of the regulation of gene activity - differential activation, regrouping and amplification of the genes. The influence of certain hormones on the differentiation of cells is highlighted. The main stages in the development of tumor cells are presented. The chapter paragraph 18.4.2 delivers data on the peculiarities in the metabolism of tumors.

4. Impacts of external factors and related changes in the body (Chapters 19 - 20).

In my opinion, Chapter 20 is of particular importance as it describes the free radicals and active oxygen species. In medical terms the role of the free radicals is expressed by the fact that they are involved in many diseases, some cancers, etc. These Chapters highlight the formation of free radicals and their action on biopolymers as well as the cellular mechanisms for antioxidant defense. The physical effects of radiation and the direct and indirect actions of ionizing radiation are also concerned.

5. Clinical and biochemical significance of some blood parameters (Chapter 21).

The blood parameters are outlined in terms of their biochemical and physiological significance. For each parameter described is the method of its determination, used in the clinical laboratory. Finally, the deviations from the normal values of each blood parameter are clinically interpreted.

Conclusion

The book "Human Functional Biochemistry" deserves a positive evaluation. It can be used by the students in medicine, dentistry, pharmacy, biology and more. Moreover, it can serve as a guide to a wide range of physicians and other professionals interested in the problems concerned in the book. For now this is the only book in Bulgarian dedicated to the functional biochemistry of humans.