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Bioelementology – A possible basis for personalized medicine development

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Chemical elements are the structural basis of all living organisms. At the same time, chemical elements and their organic and inorganic compounds exist in the human organism not as inert and independent units. Therefore, a term “bioelement” was proposed earlier. Bioelement is not a single chemical element (atom) inside a large molecule, but a temporarily formed biocomplex where the element is bound to an organic molecule with a specific biological function. In particular, certain chemical element is a physicochemical unit whereas bioelement is a precursor of biological unit. Consequently, clinical medicine aims at analysis of bioelements rather than chemical elements alone. Taking into account the fact that bioelementology is an integrative science that includes the knowledge on bioorganic chemistry, bioinorganic chemistry, biochemistry and biophysics, molecular biology, medicine and other parts of life sciences, analysis of bioelemental status of the human organism may provide more essential information on the condition of the human organism than chemical analysis of metals and other compounds in human biosamples alone. Finally, this results in the formation of a complex metabolic profile of the organism. The availability and the use of such information may help the physician to successfully correct the disturbed metabolic pathways in the human organism and finally increase the efficiency of treatment. Therefore, it can be proposed that bioelementology is not just a tool in a large arsenal of the physician but a basis for personalized medicine.

Biography

Anatoly V Skalny has completed his PhD at the age of 28 years from All-Union Centre for Narcology, Moscow, USSR. He is a vice-president of Trace Element Institute for UNESCO, the chairman of Russian Society of Trace Elements in Medicine, a member of advisory board of Federation of European Societies on Trace Elements and Minerals (FESTEM). He has published more than 200 journal articles, abstracts and book chapters in English. Prof. Skalny is a member of editorial board of Journal of Trace Elements in Medicine and Biology, the leading journal in the field of trace elements science.

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