Methods and Information Technology Tools for Regulatorika of Living Systems

Saidalieva M[1], Hidirova M[2]

[1],[2] CDS-HPC at Tashkent University of Informational Technologies,
regulatorika@yahoo.com

Methods and Information technology tools (using class of the functional-differential equations) to quantitative research regulatorika of living systems taking into account spatio-temporal organization, cooperativity, a competition for signals and the combined feedback are developed[1]. Methods of the qualitative and quantitative analysis of characteristic solutions of biosystems regulatorika equations using phase and parametrical portraits, calculations of Kolmogorov's entropy, Lyapunov's value, Hausdorff and higher dimensions have been constructed. Applying method of qualitative analysis it has been shown that regulatorika of living systems have the following regimes: rest, a steady stationary condition, self-oscillations, irregular fluctuations (dynamic chaos) and sharp destructive changes - "black hole" effect. The basic characteristics (quantity, sizes and its positions) of small regions with regular behavior in the field of dynamic chaos (r-windows) are investigated. It is developed program which oriented to quantitative research regulatory mechanisms of molecular-genetic, cellular, subcellular systems, an organism and populations. The received results can be used for the quantitative analyzing mechanisms of occurrence and development of chromosomal aberrations during malignant regeneration of cells [2], correction of clinical course of viral hepatitis and Acquired Immune Deficiency Syndrom (AIDS/HIV) development [3].

References

[1] Hidirov B.N. Isbrannye raboty po matematicheskomy modelirivaniyu regulatoriki jivyh sistem. Moskva-Ijevsk, 2014. (in Russian).

[2] Saidalieva M, Hidirova M.B. *Mathematical modeling of genetic mechanisms of cancer* // ISJ Theoretical and Applied Science 2015,**01, (21)**:pp. 84-88.

[3] Hidirov B.N., Saidalieva M., Hidirova M.B. Regulatorika jivyh sistem. "Fan va texnologiya", Tashkent, 2014.