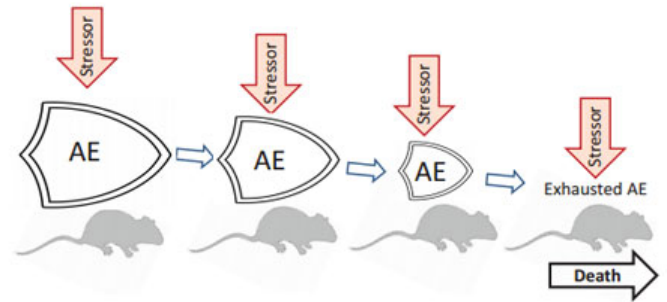


# Mathematical model of SibFU scientists explains features of adaptation

The team of the SibFU scientists led by the famous Russian mathematician Alexander Gorban, director of the Center for Mathematical Modelling of the University of Leicester (UK), formulated a mathematical model of adaptation that allows to understand how living things adapt to the environment.



Among the authors of the theory are Elena Smirnova and Lyudmila Podkidysheva, the Professors of SibFU. The results of the scientists work [were published in](#) The Journal of Theoretical Biology.

The scientist based their research on the concept of “adaptation energy”, introduced by the famous physiologist Hans Selye in 1938. He also presented a serious experimental evidence of its existence. Adaptation energy, according to Selye, is a vital resource of the organism; it is spent in any process of adaptation and is finite. A body dies after the exhaustion of this energy.

The concept of “adaptation energy” has caused debate in the scientific world, as it is not directly possible to measure it. After nearly 80 years, the mathematicians were able to develop a theory that determines the adaptation energy by its place in the mathematical models. In particular, this theory allows us to predict the periodic crises and remissions in the adaptation process. At the same time, according to the scientists, the cause of these oscillations lies not in the changeability of external factors, but in the adaptation mechanism itself.

Professor **Alesandro Juliani** from the Italian Higher Health Institute (Rome), commenting on this discovery, said: *“Gorban and his colleagues dared to make the science of adaptation in the style of thermodynamics: they are looking for powerful principles to give a real forecast before the dive into the details. This, in my opinion, is the only possible way out of the reproducibility crisis in modern biology, where a fantastic knowledge of the details is powerless to predict anything beyond a laboratory test tube.”*

[Press Office of SibFU](#), 25 april 2016

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