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## ANALYSIS OF A POSSIBLE MECHANISM OF NOISE REDUCTION IN BIOLOGICAL SYSTEMS

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### ABSTRACT

This work is concerned with model based analysis of microRNA-mediated regulation of gene and protein expression. Three simple, generic models, are introduced. These models differ in the way the system is activated, representing hypothetical versions of the regulatory system. Their responses to pulse inputs are analyzed numerically. These pulses are of varying periods and strengths, which determine if the input is a random disturbance that should be filtered out by the system, or an actual change in the environment, to which a cell should build a response. Transient system responses have been analyzed in each case. The settling time, the mean and maximum change of each variable have been chosen as response characteristics. They were subsequently used to identify the model the one which exhibits noise reduction property.

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