Mathematical modelling and analysis of miRNA regulation coupled with stochastic time delays

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Abstract

MicroRNAs are a class genome-encoded ~22 nucleotide (nt)-long RNAs that silence gene expression by repressing translation and/or by promoting mRNA. In this paper, we investigate the time delay model of a feedback system regulated with miRNA. In our previous paper [10], using the Hopf bifurcation theorem, we predict the occurrence of a limit cycle bifurcation for the time delay parameters. Here, from the accomplished results it becomes clear that miRNA inhibition coupled with a stochastic time delay can have a stabilizing dynamical role.

Keywords: miRNA, stochastic time delay, bifurcation point