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The effect of negative autoregulation on eukaryotic gene expression DMITRY NEVOZHAY, RHYS ADAMS, Dept. of Systems Biology, UT M. D. Anderson Cancer Center, KEVIN MURPHY, Harvard Medical School, KRESIMIR JOSIC, Dept. of Mathematics, University of Houston, GÁBOR BALÁZSI, Dept. of Systems Biology, UT M. D. Anderson Cancer Center — Negative autoregulation is a frequent motif in gene regulatory networks, which has been studied extensively in prokaryotes. Nevertheless, some effects of negative feedback on gene expression in eukaryotic transcriptional networks remain unknown. We studied how the strength of negative feedback regulation affects the characteristics of gene expression in yeast cells carrying synthetic transcriptional cascades. We observed a drastic reduction of gene expression noise and a change in the shape of the dose-response curve. We explained these experimentally observed effects by stochastic simulations and a simple set of algebraic equations.

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