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Effects of time-delayed negative feedback loops on noise-induced oscillations on the NF-KappaB signaling network JAEWOOK JOO, JEAN-LOUP FAULON, Sandia National Laboratories — NF-kappaB is a stimulus-responsive pleiotropic regulator of gene control. Our work was motivated by Nelson et al. [Science 306:704 (2004)], which showed noisy quasi-periodic oscillations of NF-kappaB translocation between cytoplasm and nucleus in single cells. Using both stochastic simulations and analytical approaches, we investigated the dynamic patterns of NF-kappaB translocation with a stochastic two-compartmental model, especially taking into account the interplay between intrinsic noise and delayed negative feedback loops of the NF-kappaB signaling system. We will present noise-induced oscillations of the NF-kappaB shuttling and the effects of time-delayed negative feedback loops on them.

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