Amplified negative feedback loop as a model for LPS-induced NF-kappaB response

Jaewook Joo[1]

***Short Abstract* — The cells secrets various signaling molecules as a response to an external signal and modulate its own signaling processes. The precise role of this autocrine and/or paracrine signaling on cell information processing is mostly unknown. We will present the effect of TNF alpha autocrine signaling on NF-kappaB oscillations, using a simplified model of amplified negative feedback loop. We will discuss the bifurcation diagram (i.e., dose-response curve), especially the robustness and the tenability of the period of NF-kappaB oscillations. Finally, we will compare the results from the above model with those from a previous model of time-delayed negative feedback alone.**

***Keywords* — NF-kappaB, TNF alpha, Toll-like receptor 4 signaling, autocrine signaling, oscillations.**

[1]Department of Physics and Astronomy, University of Tennessee, Knoxville. Email: jjoo1@utk.edu