Title: Dynamic behavior of hormone signaling. [1]

I would like to look at Auxin signaling in *Arabidopsis Thaliana.* Auxin is a hormone which regulates growth and development during the life cycle. It follows that Auxin induces a wide range of gene transcription. The manner of this regulation is interesting since Auxin regulated genes are held in an expression-inhibited state. Upon Auxin signaling, these repressors are signaled for degradation. Furthermore, downstream products of Auxin motifs, include the repressors themselves, thus a time delayed negative feedback loop. I would like to examine the dynamics of this mechanism, and try to understand 2 major issues (i) is there a tradeoff from this negative feedback loop. (ii) can we substitute the expressions for degradation by expressions of inhibition and receive the same dynamic behavior? Auxin is present in the cell at a uM concentration when signaling. Repressor molecules are present at 0.1uM concentration and have a short half life.

1. Leyser, O., *Molecular genetics of auxin signaling.* Annu Rev Plant Biol, 2002. **53**: p. 377-98.