

Table S1. Hard constraints in the NF- κ B signaling fits.

Index	Constraint description	Constraint
1	Exit rate of NF- κ B-I κ B from the nucleus is greater than free NF- κ B	$ke2a > ke1$
2	Exit rate of NF- κ B-I κ B from the nucleus is greater than free I κ B	$ke2a > ke2$
3	IKK mediated degradation of free cytosolic I κ B is greater than the basal rate	$kt1a > c4a$
4	IKK mediated degradation of NF- κ B bound cytosolic I κ B is greater than the basal rate	$kt2a > c5a$
5	At equilibrium there is some NF- κ B in the nucleus	$\frac{nNF\kappa B_{eq} + nNF\kappa B - I\kappa B_{eq}}{TotalNF\kappa B} \in [0.05, 0.5]$
6	At least 1 TNFR molecule/cell is activated	$\min(TNFRa) > 1$
7	At least 1 IKK molecule/cell is activated	$\min(IKKa) > 1$
8	Equilibrium check before TNF stimulation	Rate of change for each model species $< 1e-4$ molecules/ $5e5$ seconds