



Figure S4. Two-component system kinetics with non-steady state open loop gain that switches between positive and negative. A-B. Induction of transcriptionally active response regulator dimer $(RRP)_2$ in a case with negative steady state open loop gain and open loop dynamics with basal ($R_0 = (RRP)_2 |_{k_{ph}=10}$) or high expression ($R_0 = (RRP)_2 |_{k_{ph}=0.1}$). C. Non-steady state open loop gain switches between positive and negative over time. D. Downstream protein induction is slowed by feedback in this case. Parameters: $k_{ap}=0.185045$, $k_{ad}=5.16274$, $k_{pi}=3.04614$, $k_{ip}=2.3304$, $k_b=4.06472$, $k_d=0.0528448$, $k_{bl}=0.338406$, $k_{dl}=0.04235$, $k_{RRPdm}=0.962574$, $k_{RRPmd}=1.43538$, $k_{txn}=0.0000755422$, $k_{SKtsn}=0.036068$, $tsn\ mult=15.4986$, $k_{txnbasal}=3.41719 \times 10^{-6}$, $K_{mDS}=0.15259$, $K_m=1.40665$, $k_{mRNAdeg}=0.0115463$, $k_{exp}=0.00995825$, $K_{mexp}=0.216291$, $k_{exd}=8.23057 \times 10^{-6}$, $K_{mexd}=0.0282159$.