



Figure S6. Parametric analysis of model predicts that SPI1 gene circuit functions as an amplifier and encodes a hard activation threshold.

(A) Effect of HilD positive feedback on HilA expression. Plot shows steady-state concentration of HilD as a function of the parameters k_D and α_D . The parameter k_D

specifies the degree by which the SPI1 regulators - HilC, HilD, and RtsA - can activate HilD expression, effectively the strength of positive feedback on HilD expression. The parameter α_D specifies the strength of the signal activating HilD expression. (B) Effect of HilC and RtsA on HilA expression. Plot shows the steady-state concentration of HilD as a function of the parameters k_C , k_R , and α_D . The parameters k_C and k_R specify the degree by which the SPI1 regulators - HilC, HilD, and RtsA - can activate HilC and RtsA expression, respectively. In other words, these parameters set the strength of feedback on HilC and RtsA expression. In these simulations, the parameters k_C and k_R were both varied in tandem: the numerical values for the two are the same. (C) Effect of HilE on HilA expression. Plot shows the steady-state concentration of HilD as a function of the parameters α_E and α_D . (D-E) Effect of HilE and HilD positive feedback on HilD (D) and HilA (E) expression. Plots shows the steady-state concentrations of HilD and HilA as a function of the parameters α_E and k_D . The black lines in the plots (A-C) are used to denote the results obtained using the nominal parameters (aside from α_E). A detailed description of the model is provided in the Materials and Methods.