

Fold change detection  
(in contrast to absolute)

Light sensitivity,  
Webers law (on weight)  
Even psychology 😊

## Fold change in bacteria chemotaxis

32  $\mu\text{M}$

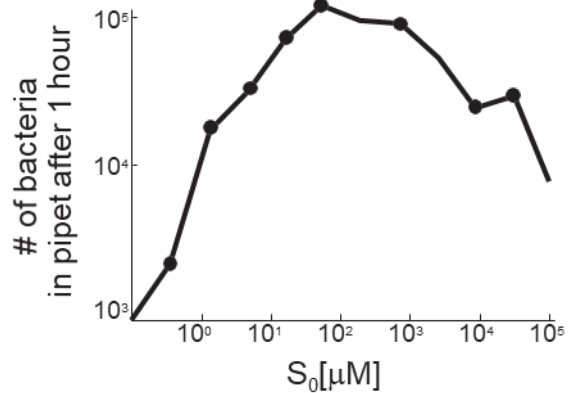


$S_0 = 10 \mu\text{m}$

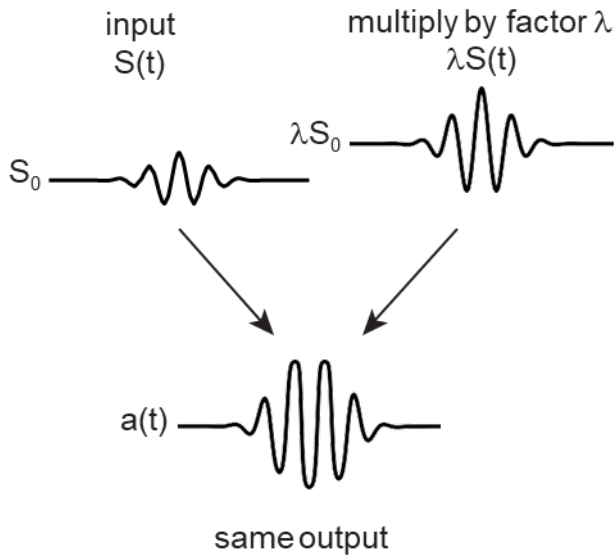
320  $\mu\text{M}$

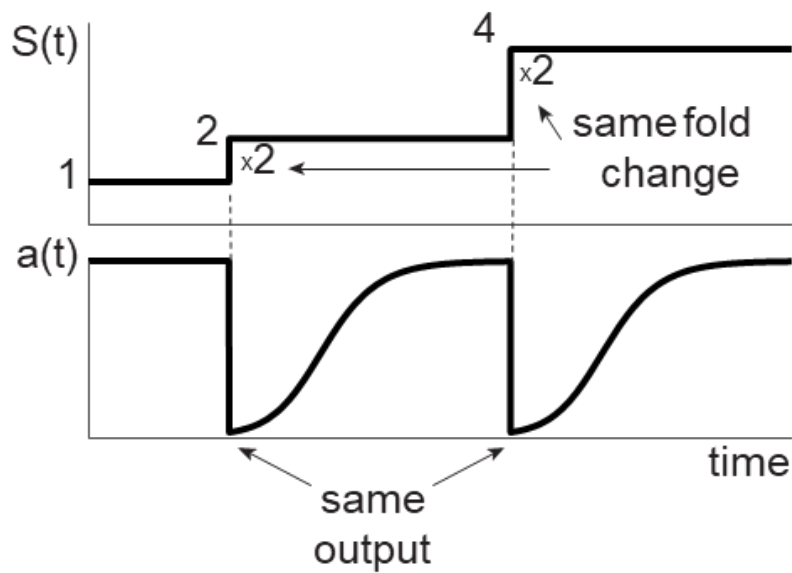


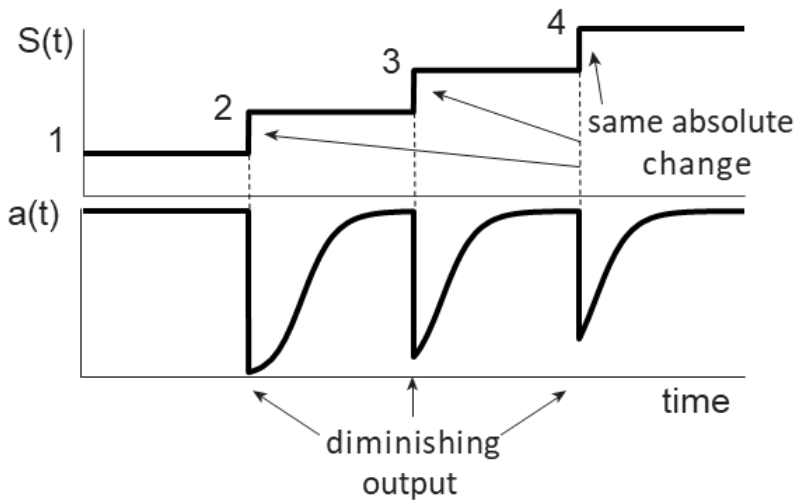
$S_0 = 100 \mu\text{m}$



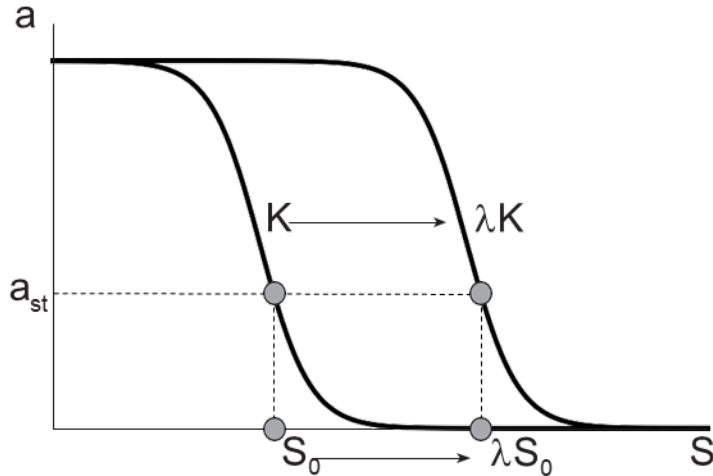
Formally, fold change needs to compensate for multiplication if background



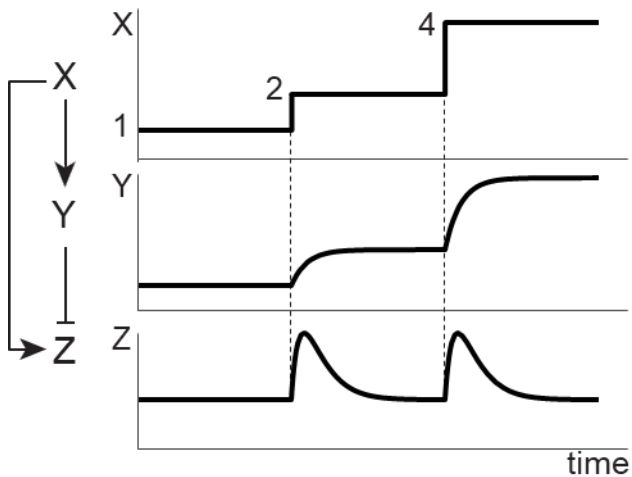




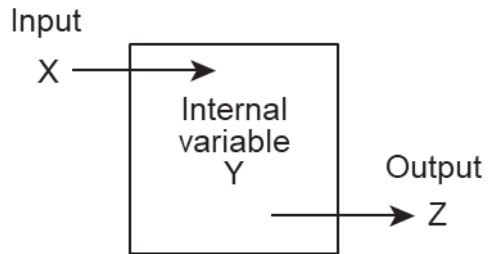
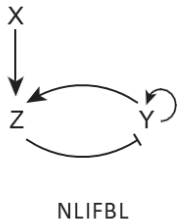
K adaptation in bacteria leads to FCD  
(loop is called: Non-linear integral feedback loop)



Incoherent Feed Forward loop can do the same!

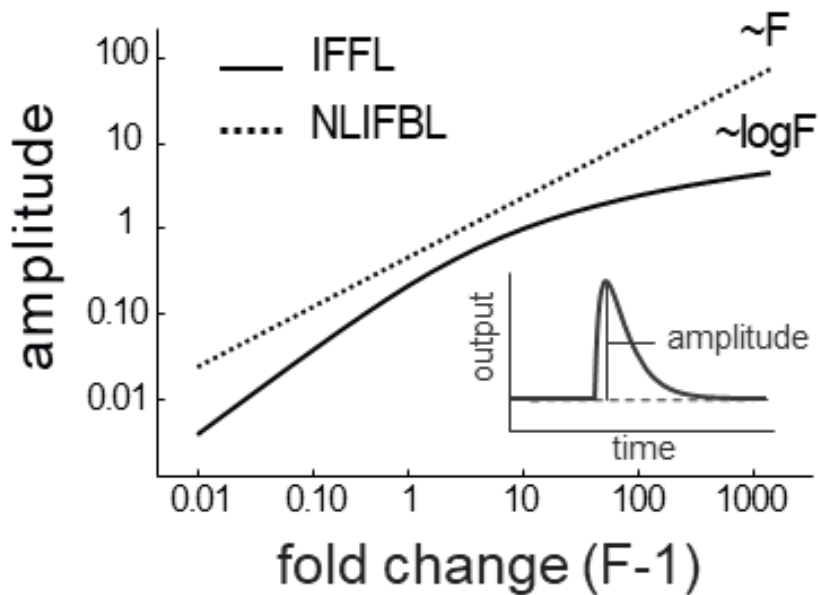


# General condition for FCD

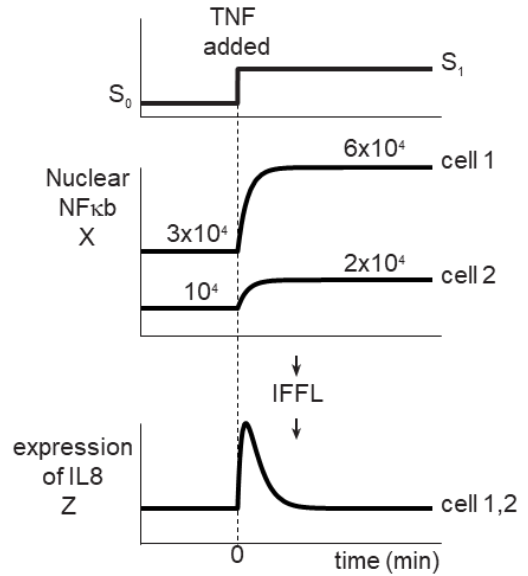
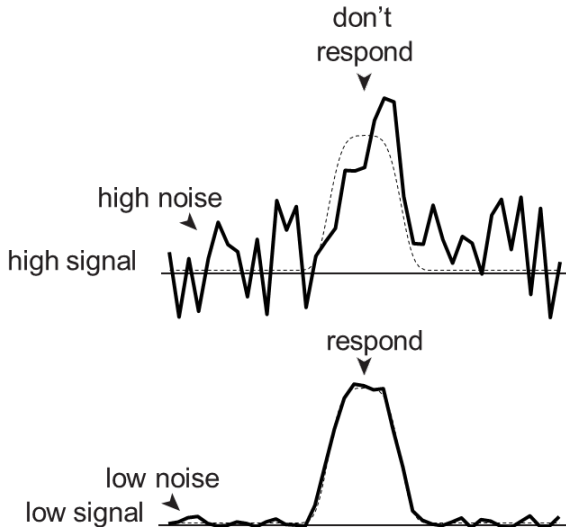




Can we identify which circuit is at place?



# Robustness and scale invariant searches



(role of Y is p50, competing to binding sites)

