

Cellular regulation

Positive and negative feedback in signal transduction

Gene networks

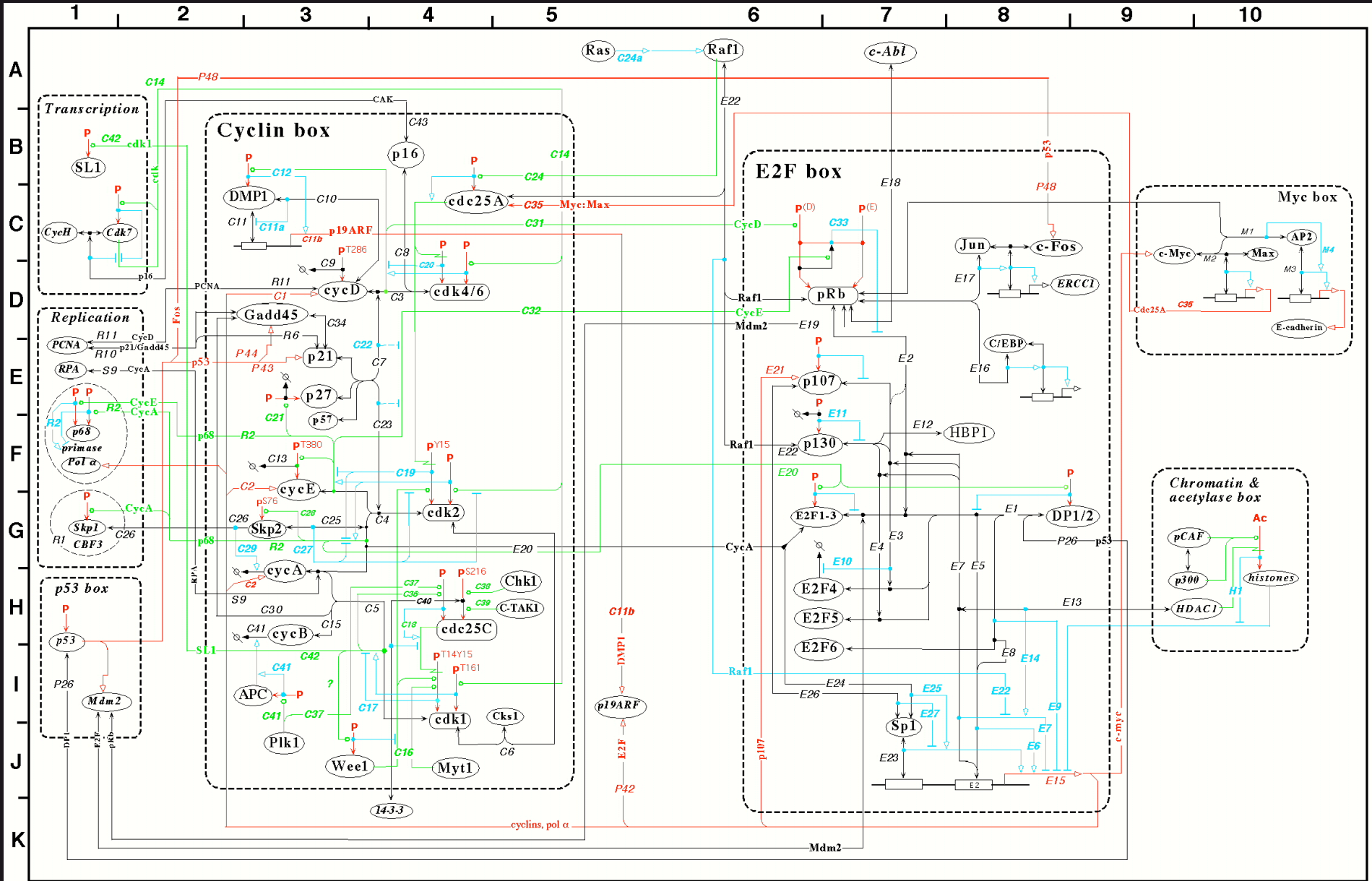


Figure 6A: The Cyclin - E2F cell cycle control system (version 3a - June 8, 1999)

How does a cell respond as a function
of the magnitude of stimulus?

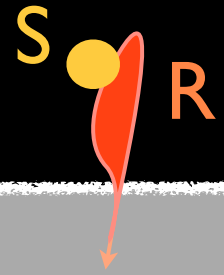
Does stimulus-response function influence the fitness
of the cell or the organism?

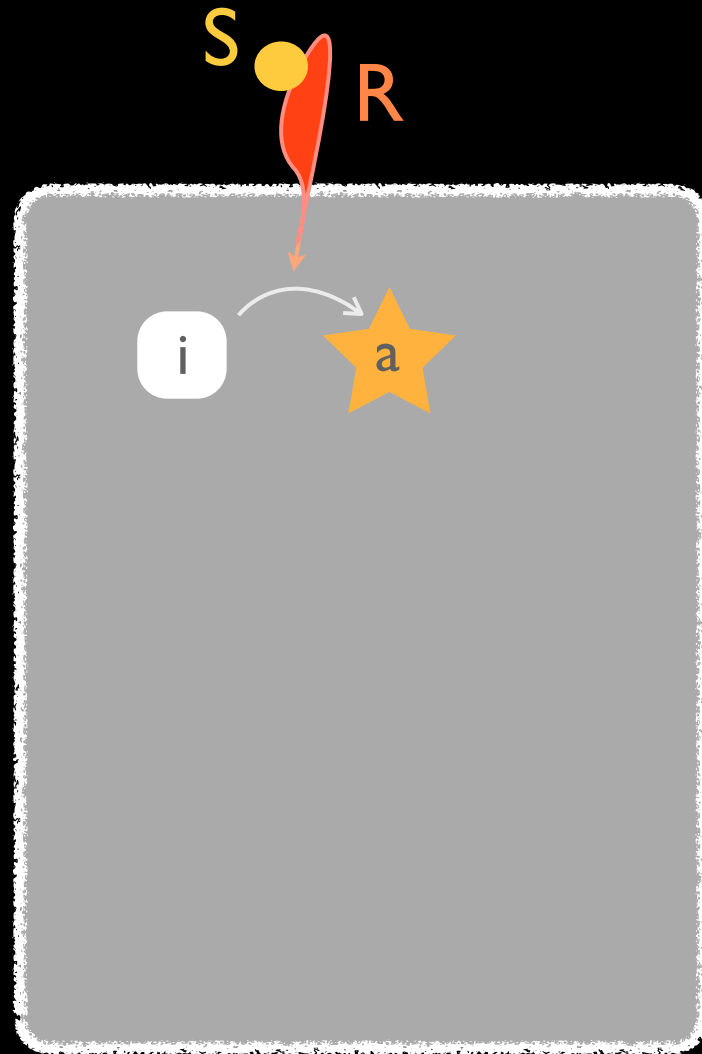
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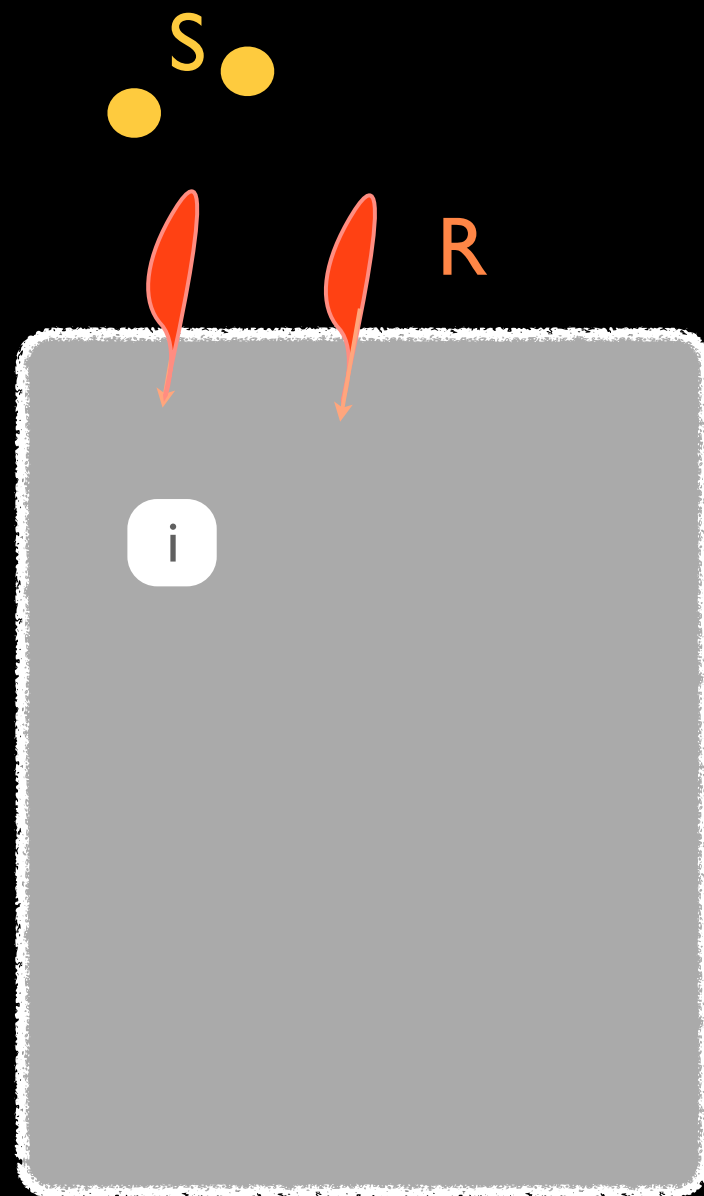


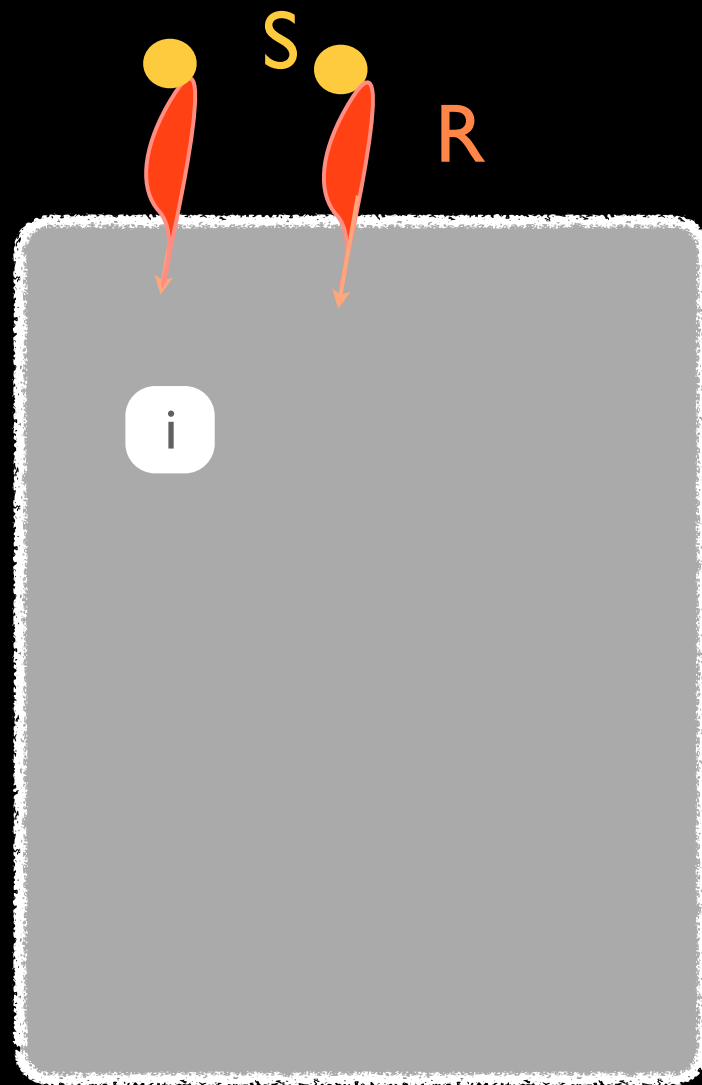


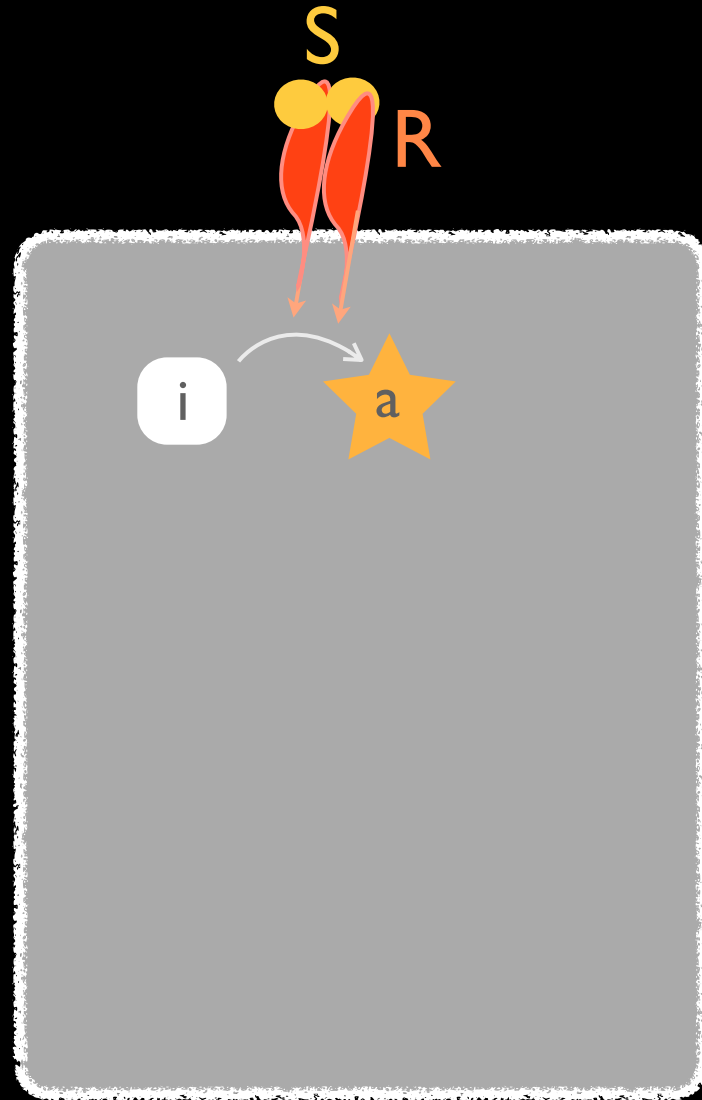
monotonous response

first order kinetics

saturated response by
exhaustion of receptor





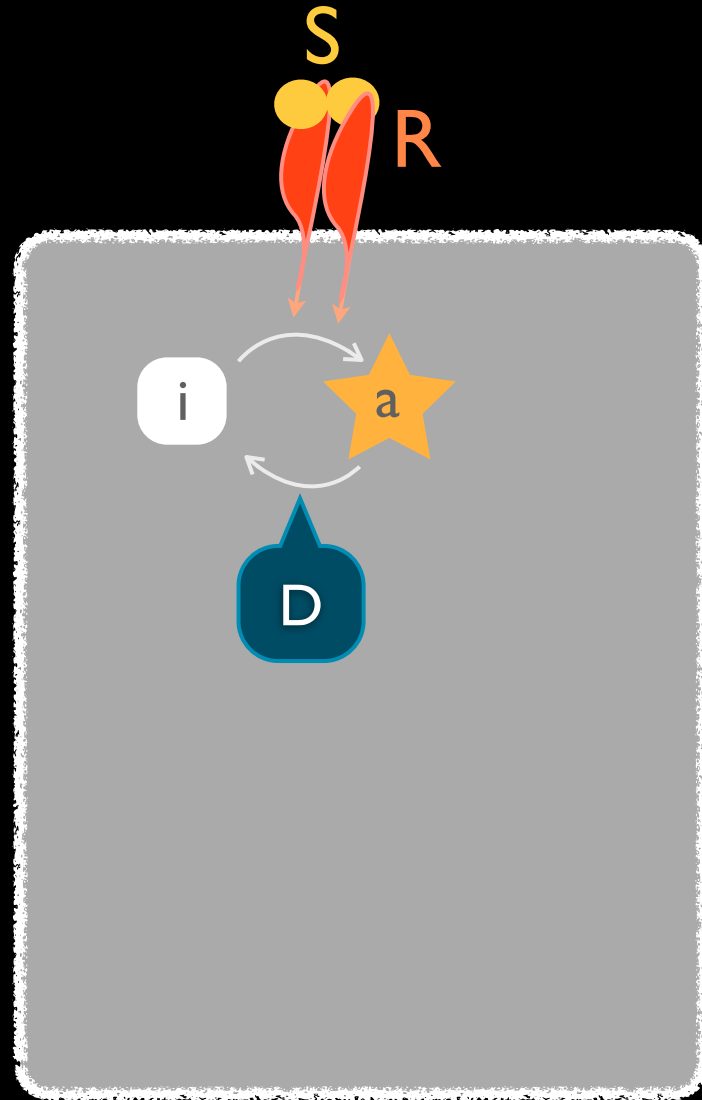


monotonous response

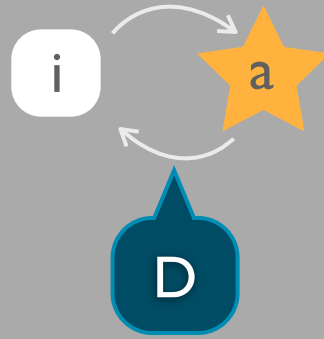
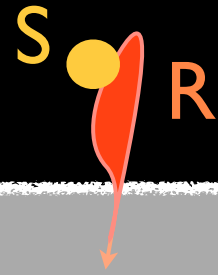
second (or higher)
order kinetics

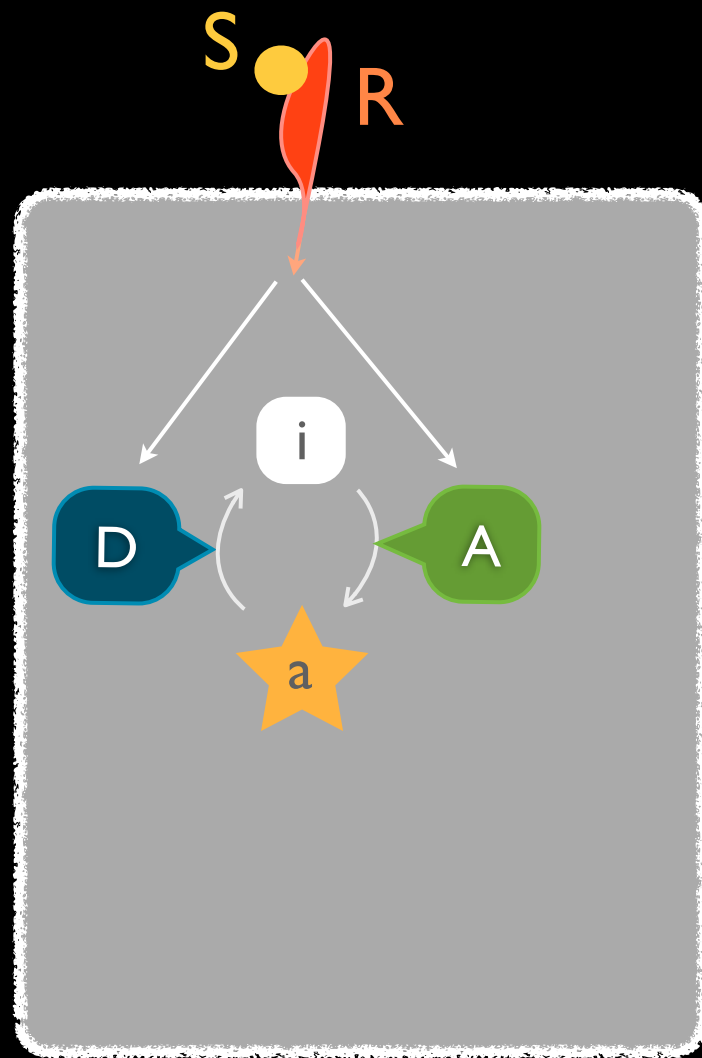
sensitivity

saturated response by
exhaustion of receptor



threshold response

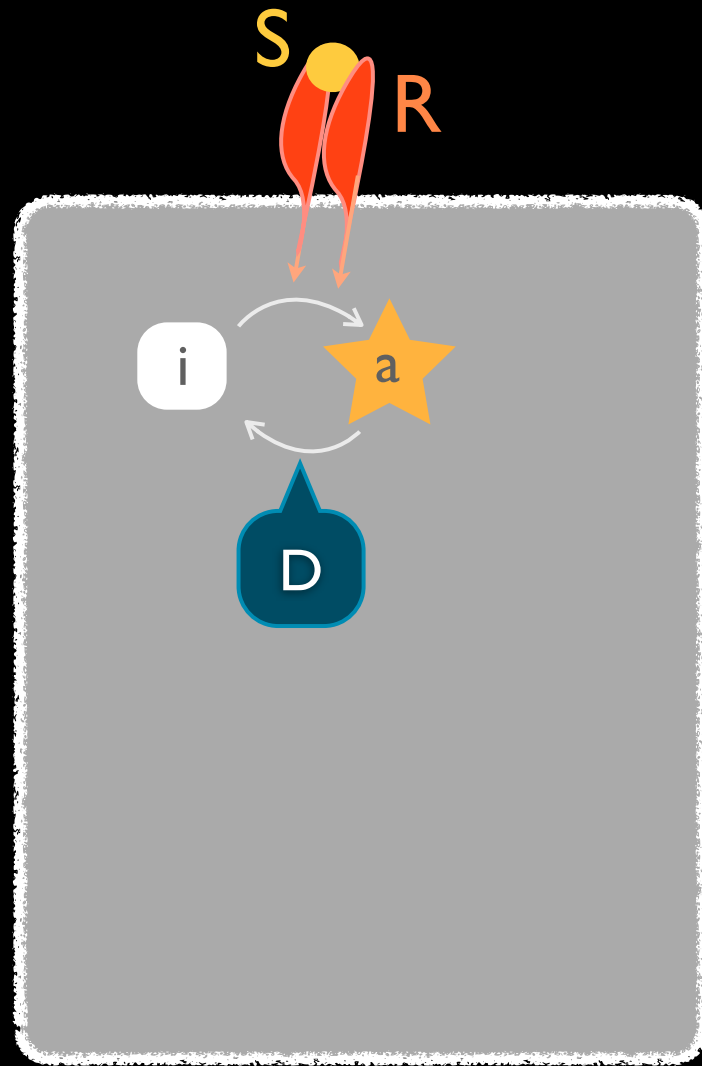




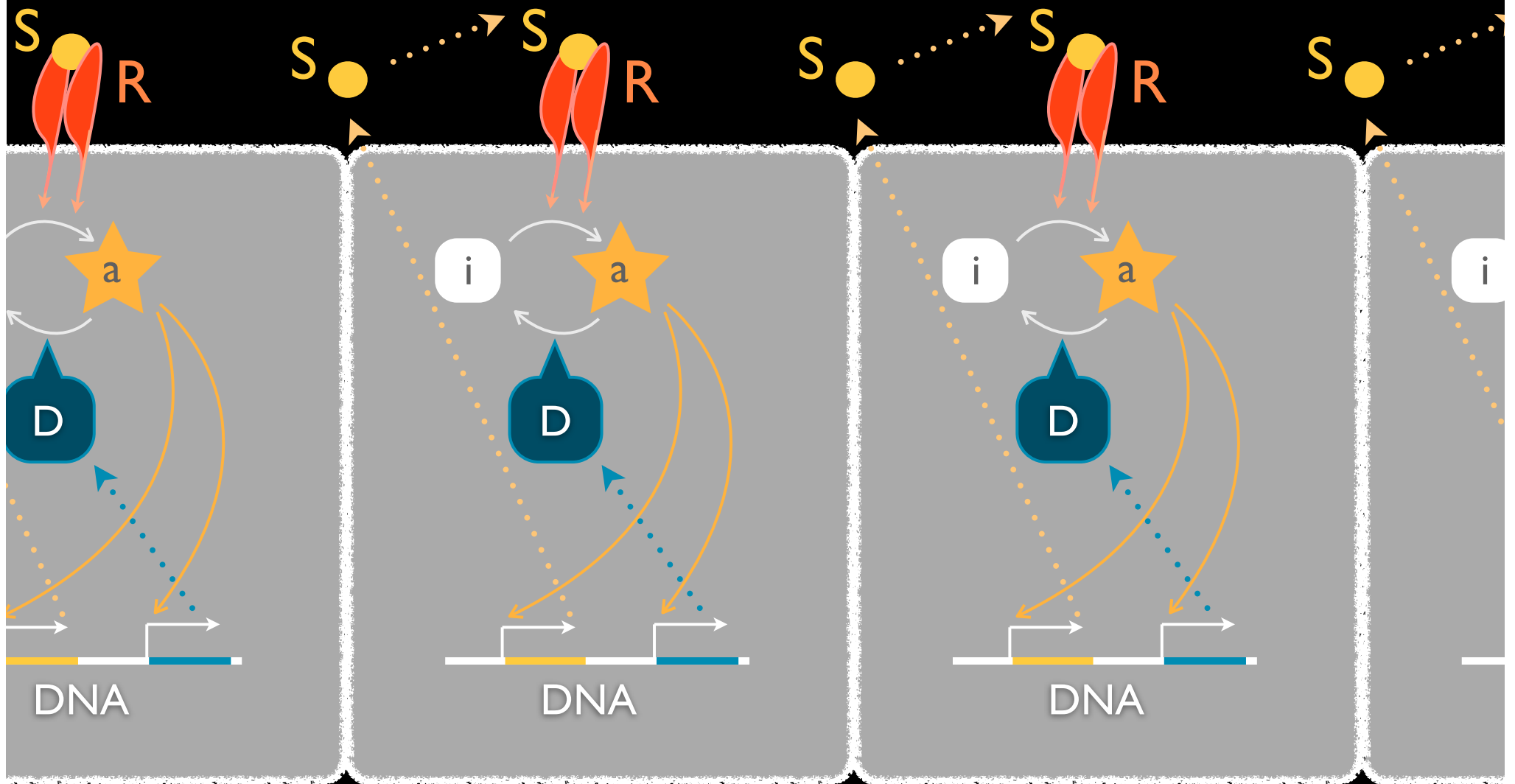
desensitization

adaptive response

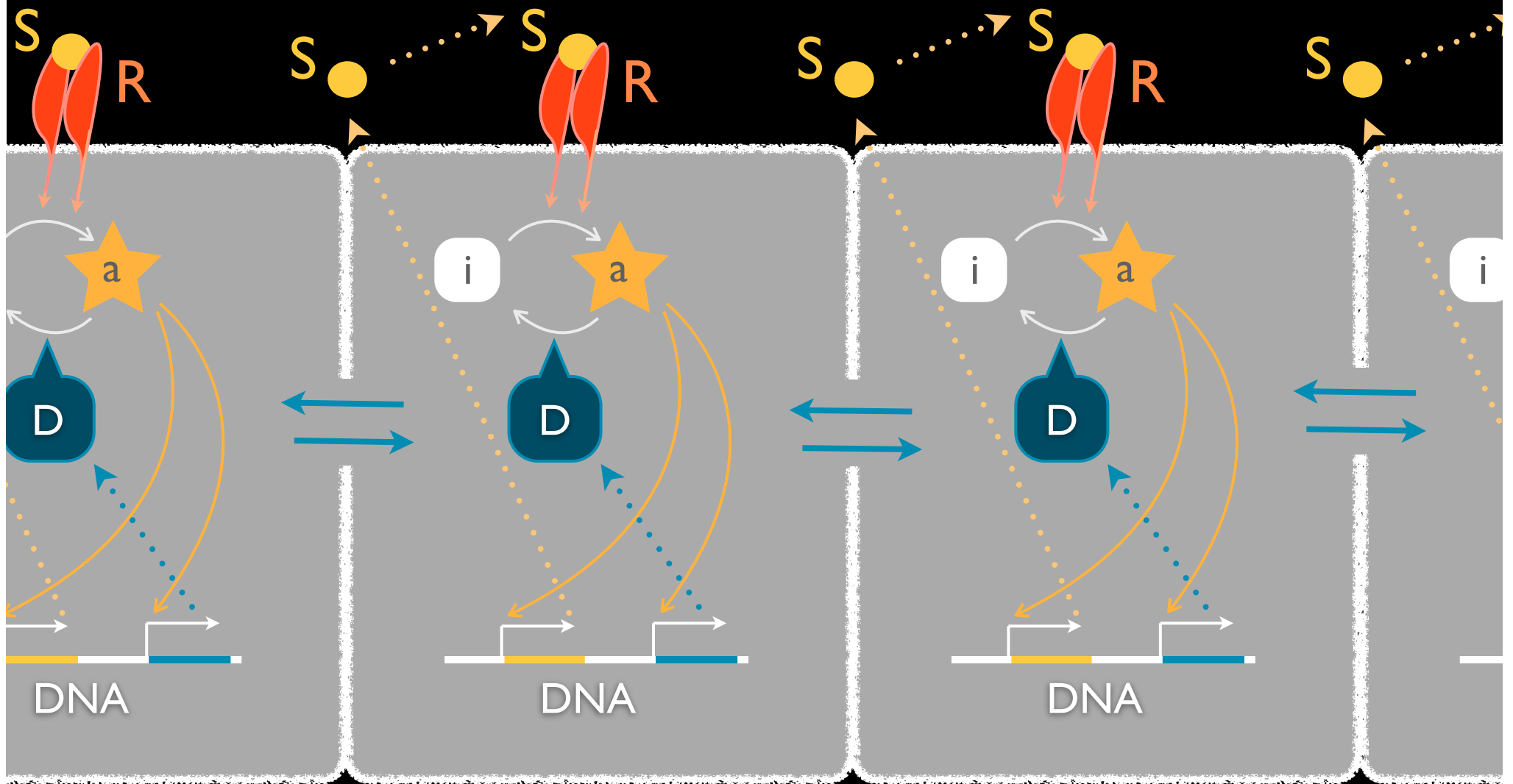
response to differences



oscillations



transient responses to travelling waves
molecular switches to propagating relays



local switch with lateral inhibition
repeated patterns in space