

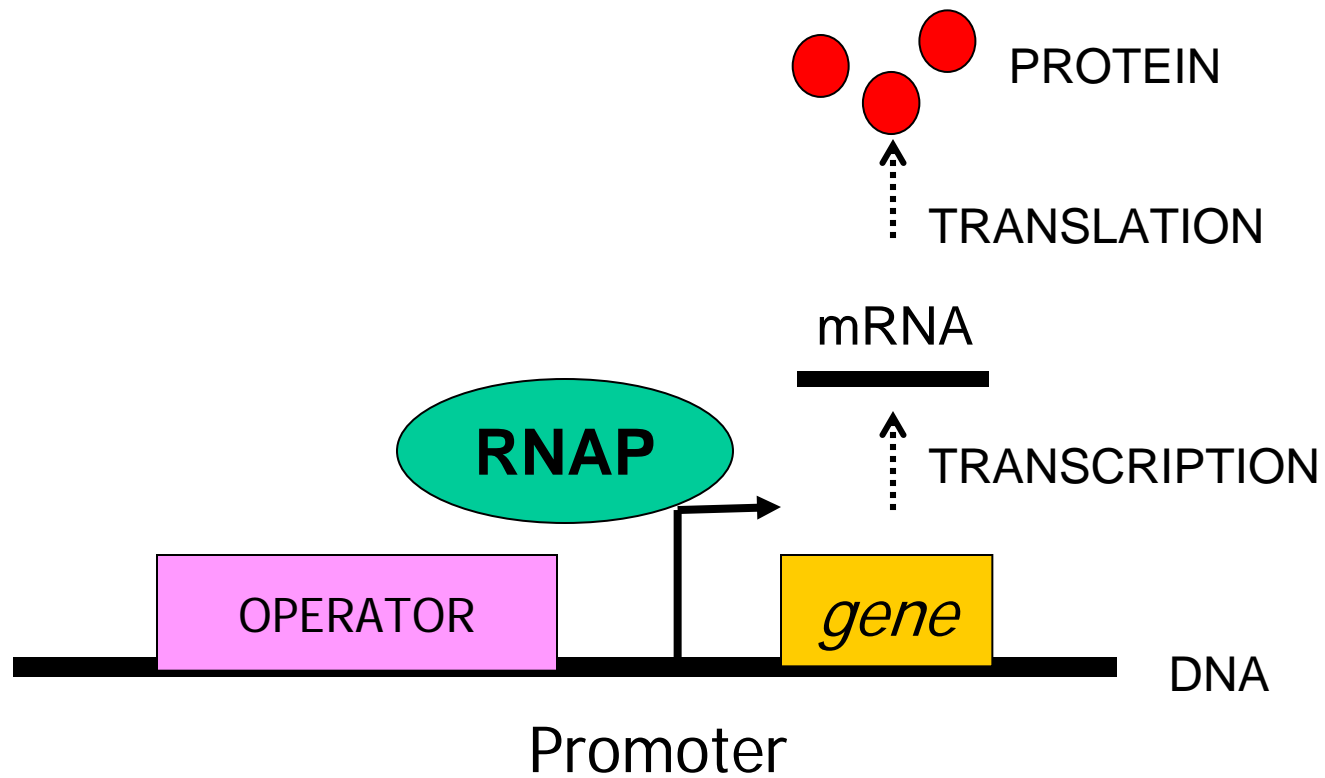
VISUALIZATION OF GENETIC CIRCUITS

STEPHEN DAVIES

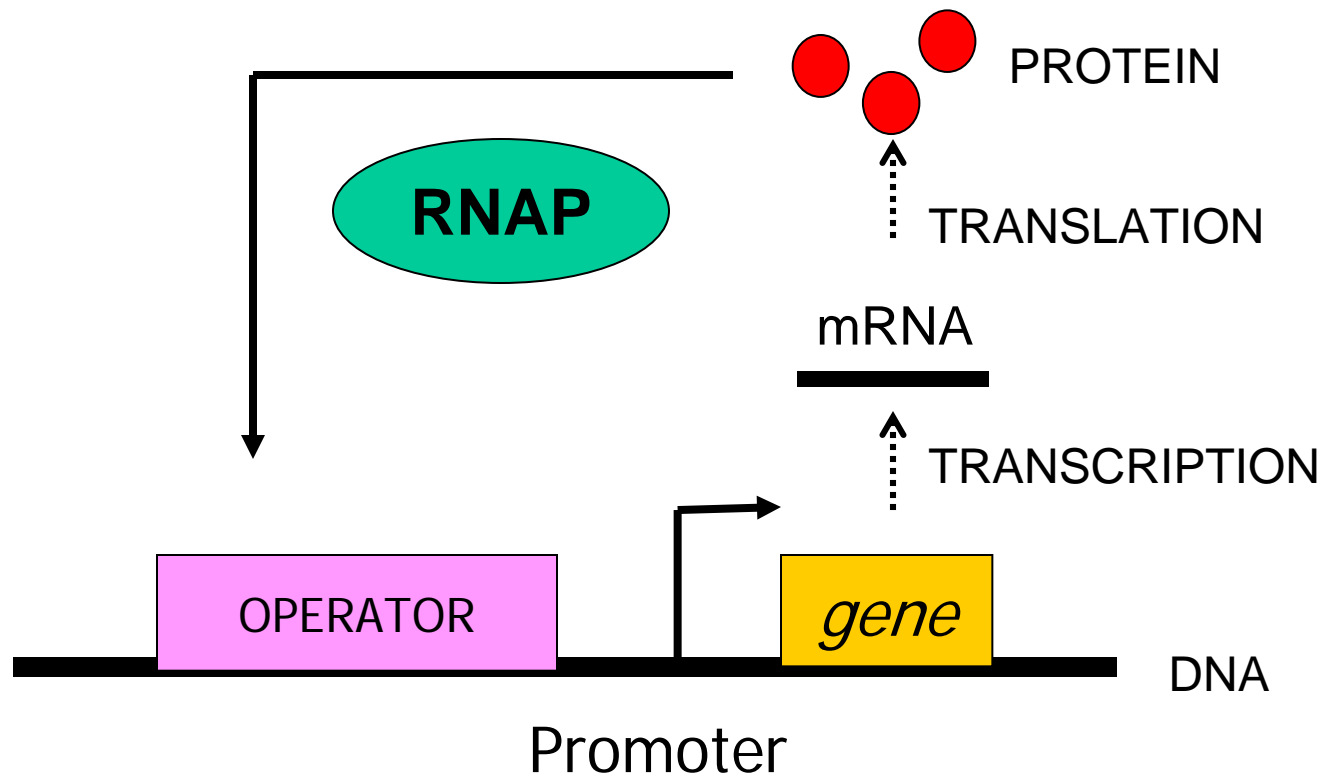
Institute of Biomaterials and Biomedical Engineering
Department of Electrical and Computer Engineering
University of Toronto



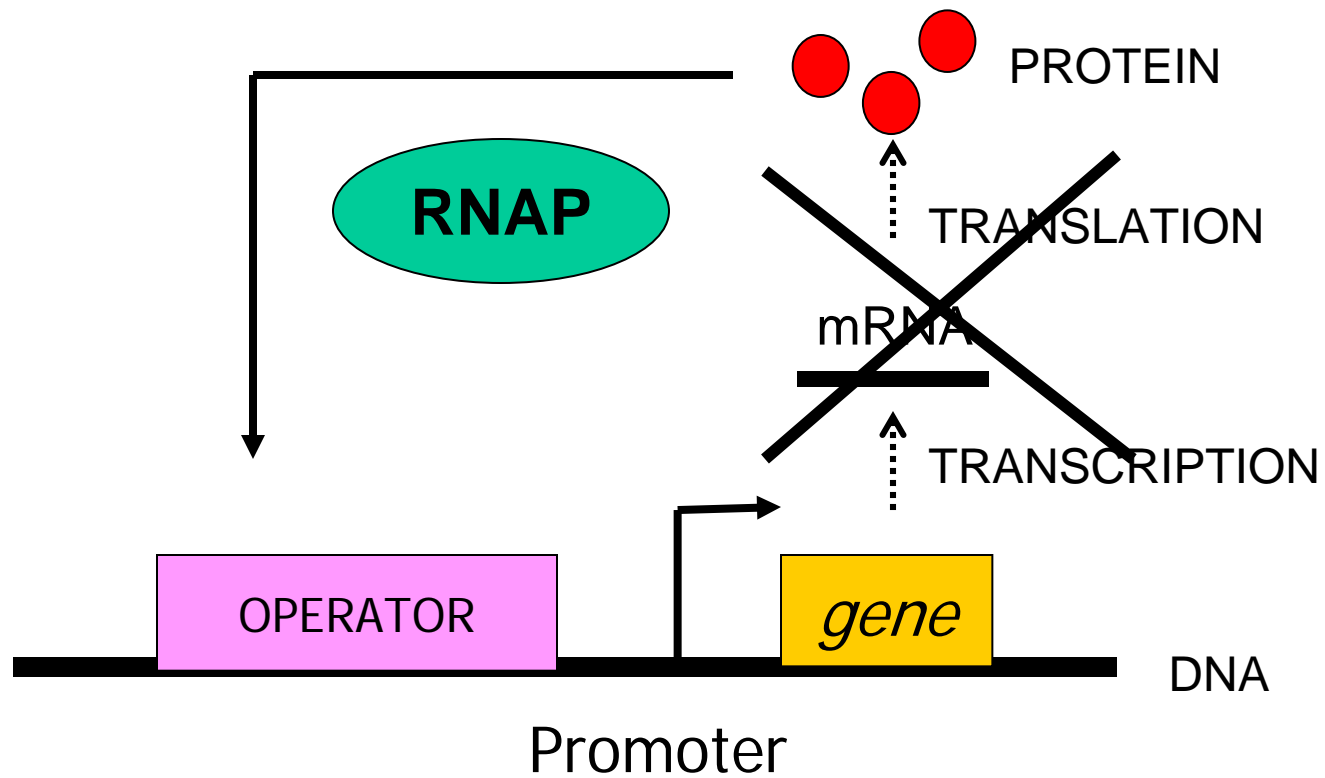
NATURAL GENETIC CIRCUIT



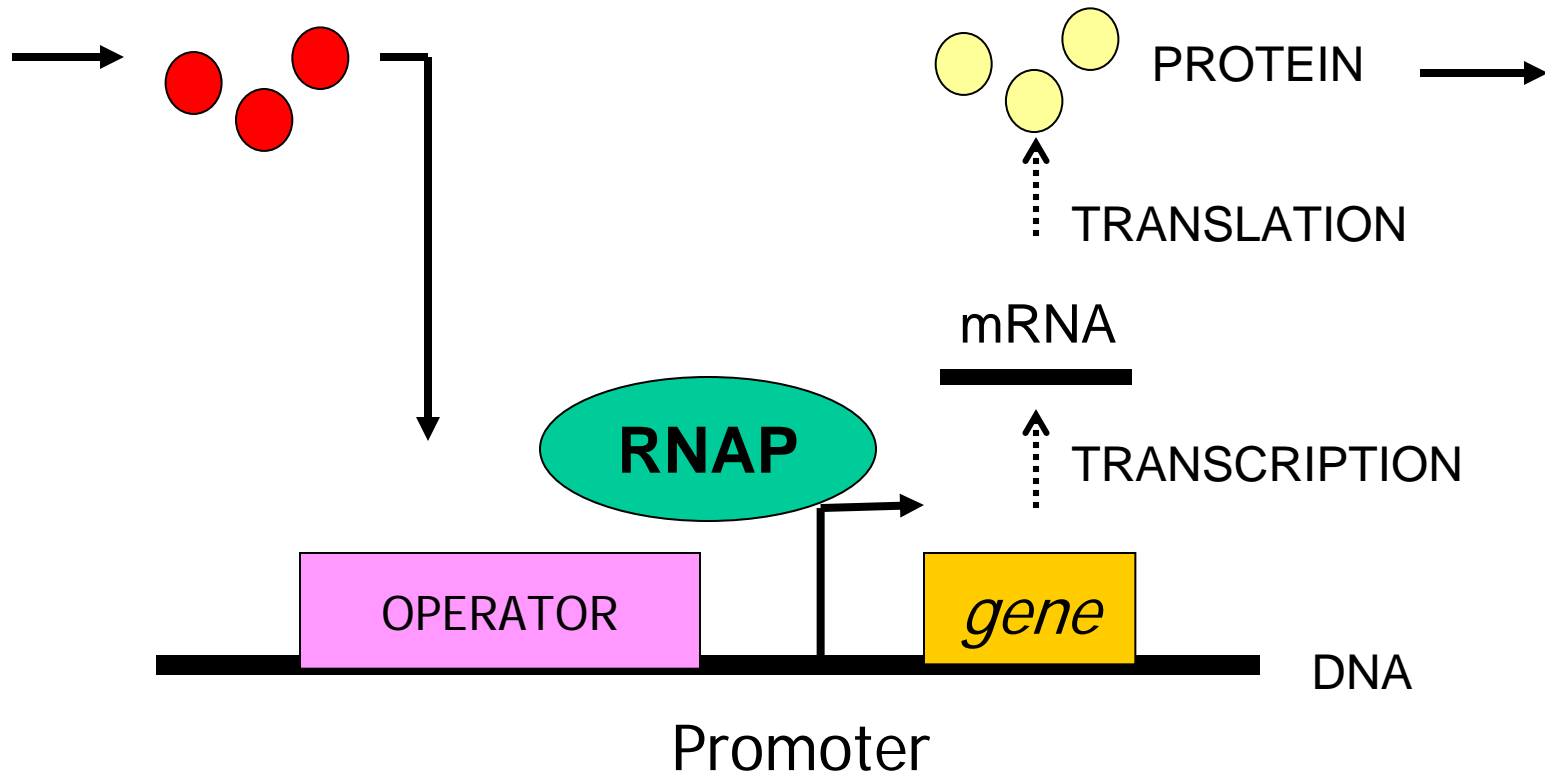
NATURAL GENETIC CIRCUIT



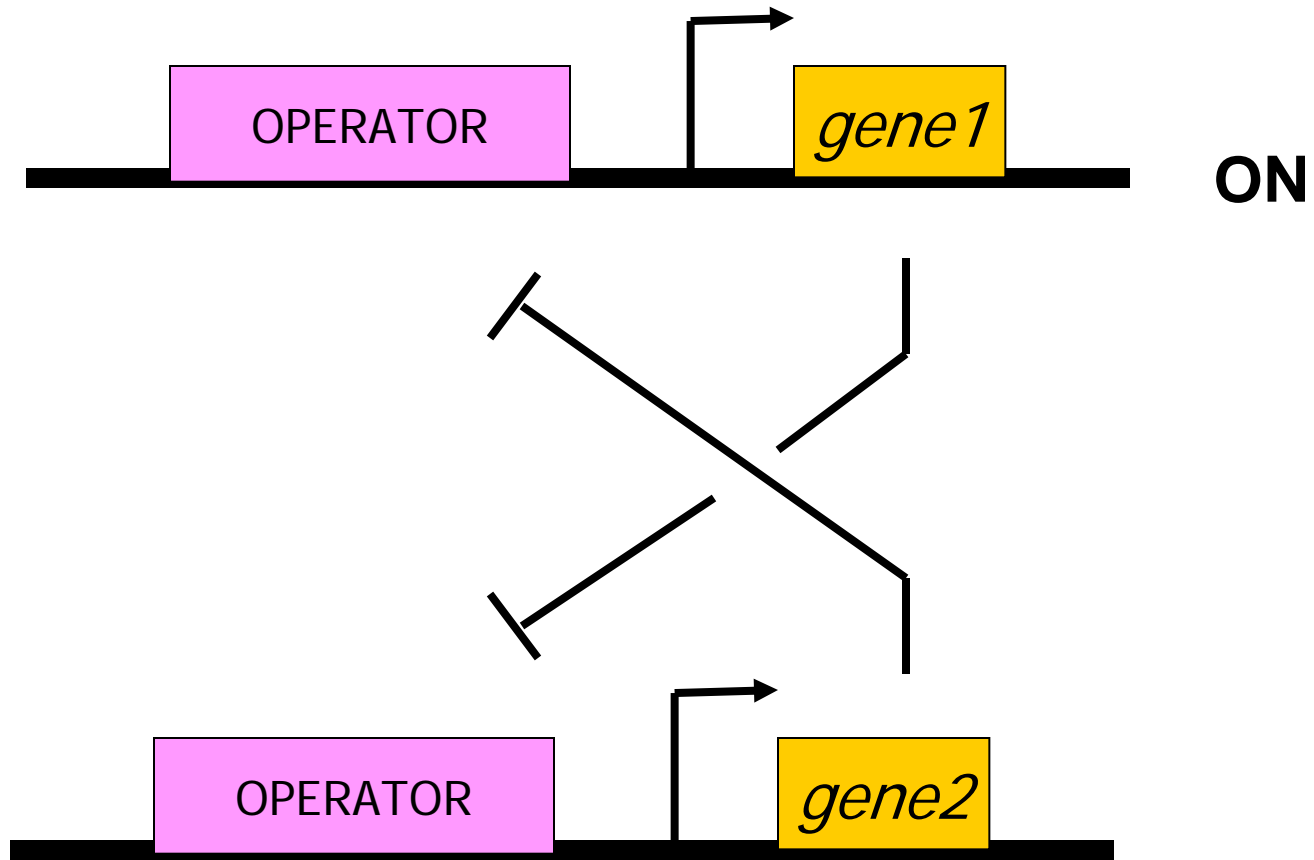
NATURAL GENETIC CIRCUIT



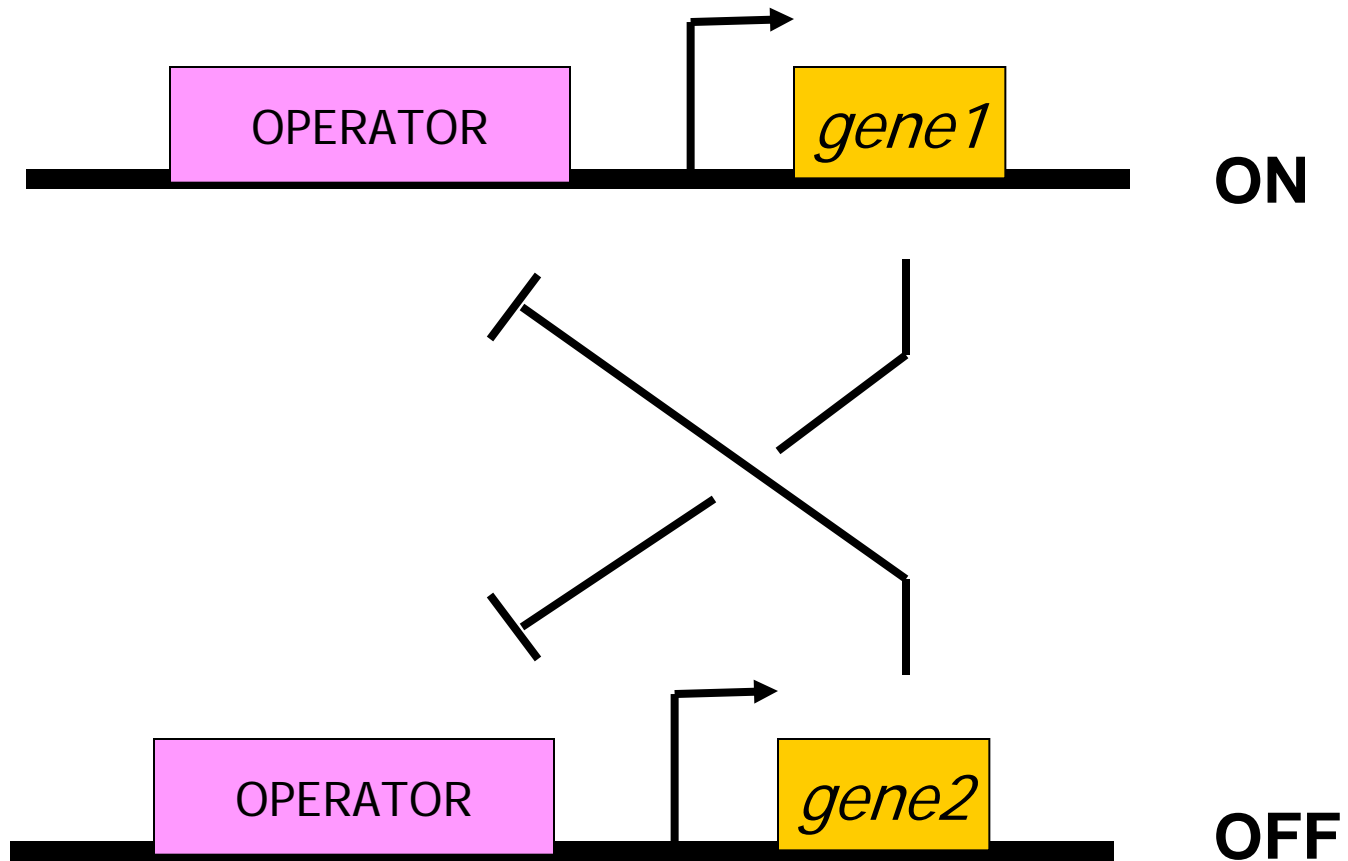
ENGINEERED GENETIC CIRCUIT



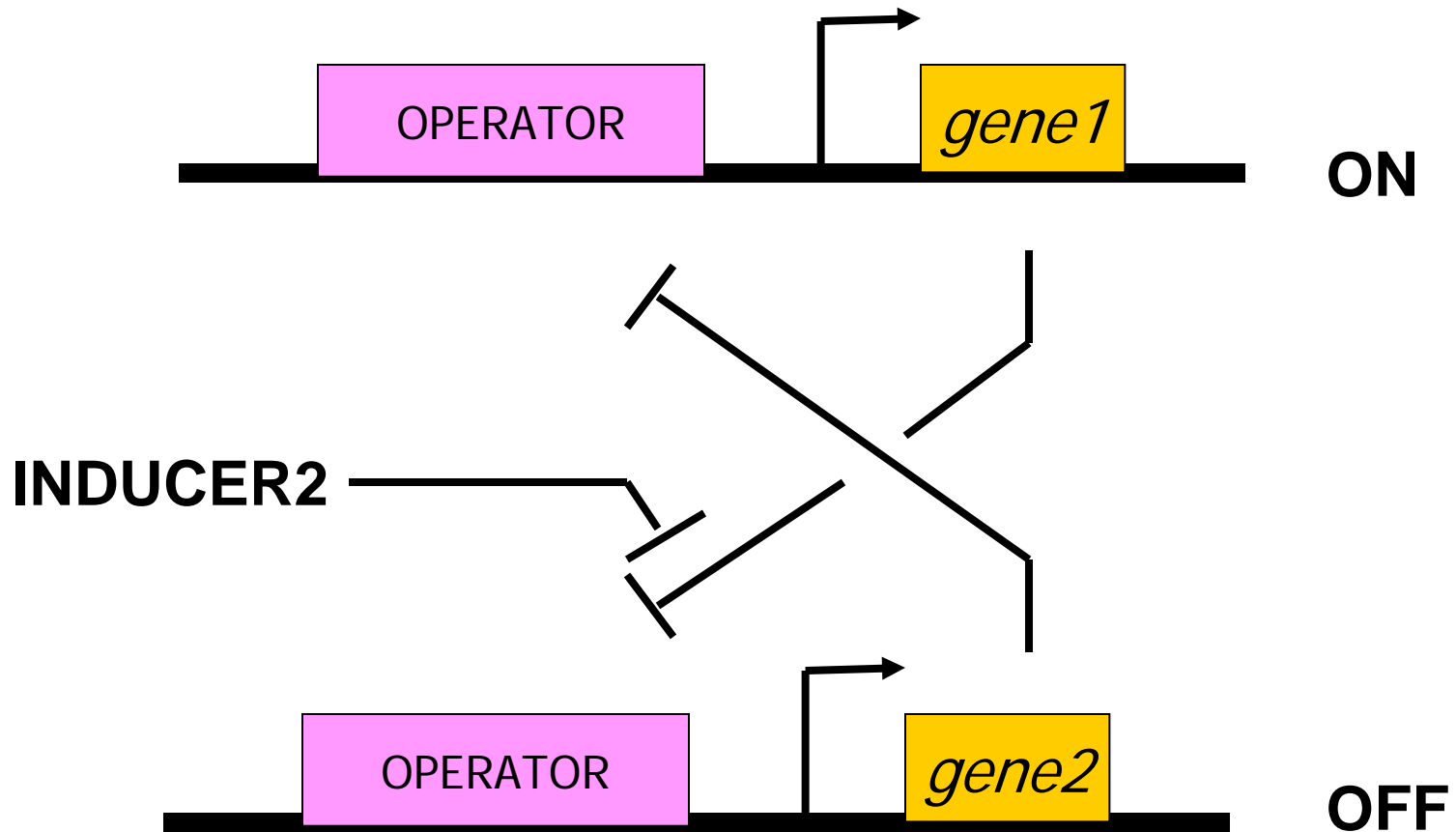
TOGGLE SWITCH



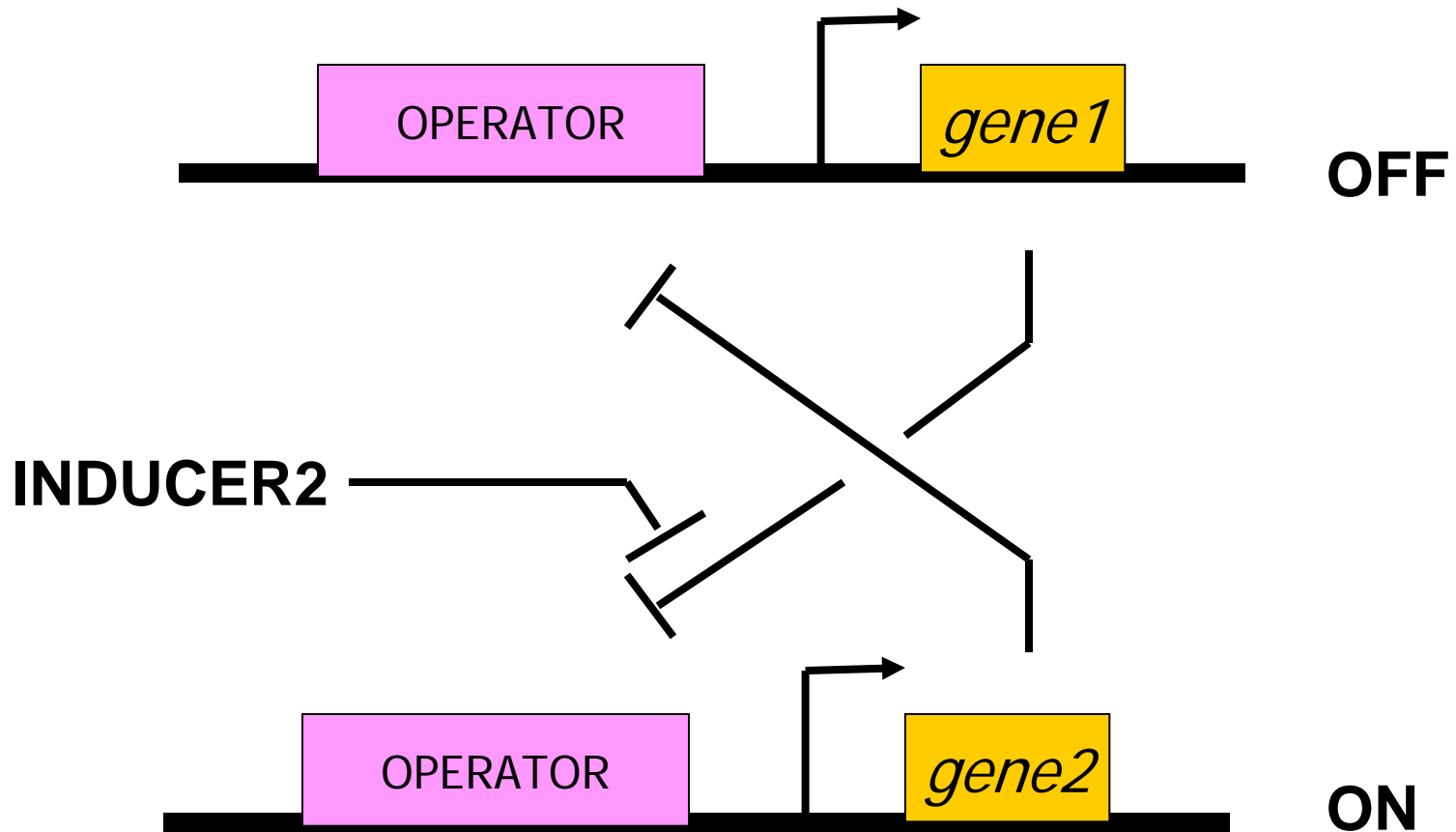
TOGGLE SWITCH



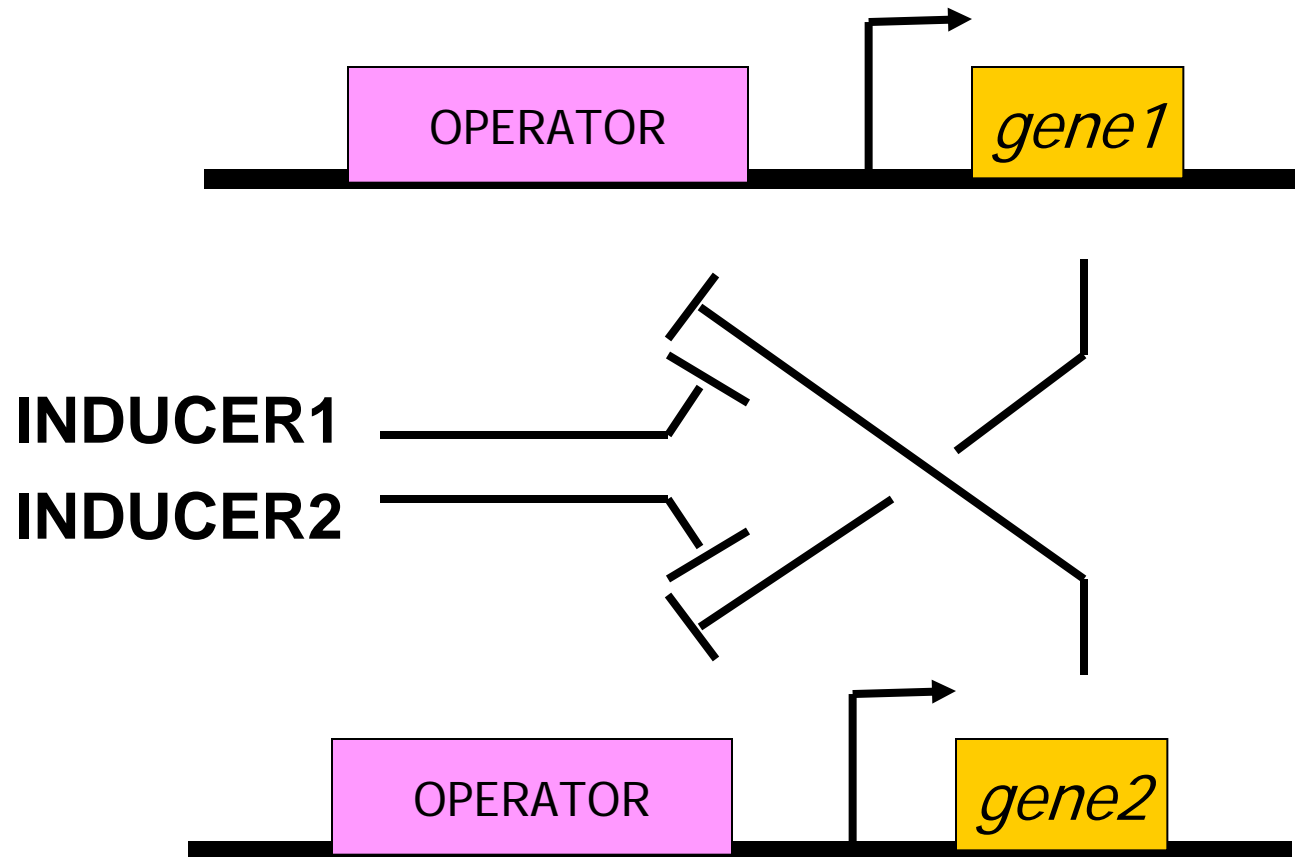
TOGGLE SWITCH



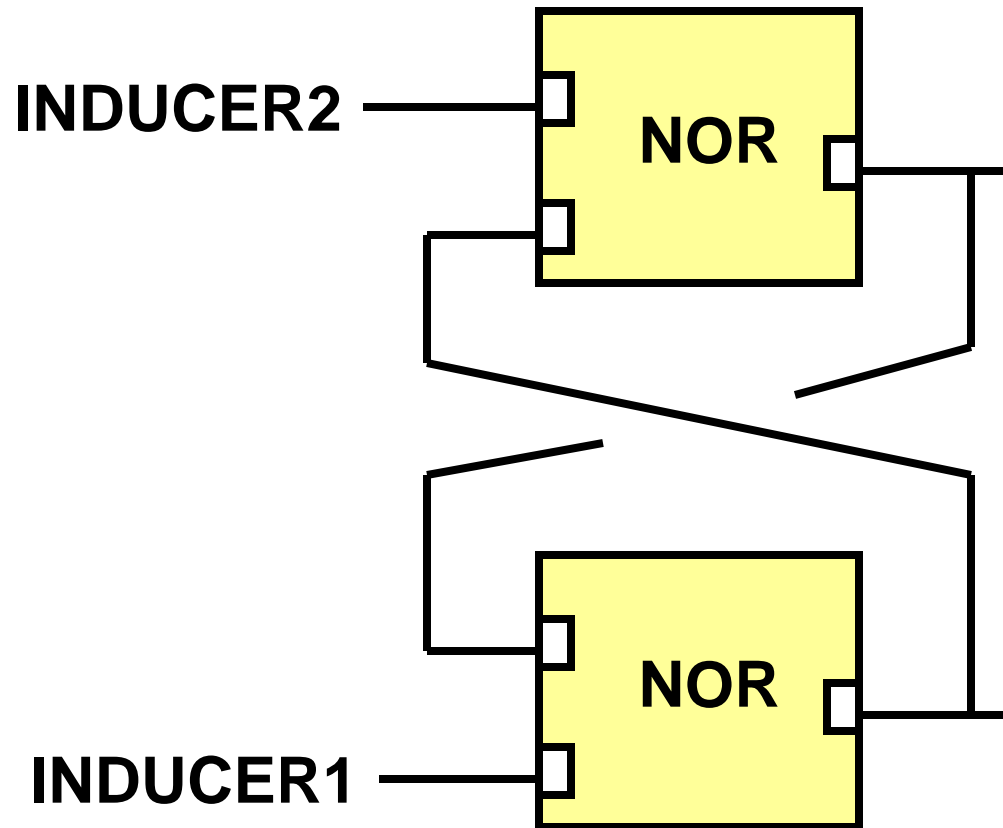
TOGGLE SWITCH



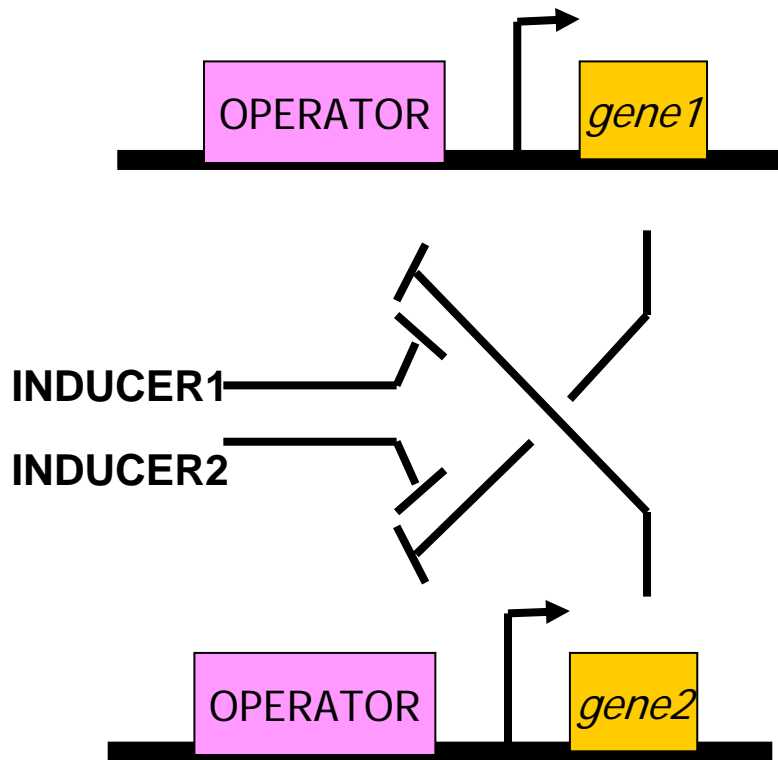
TOGGLE SWITCH



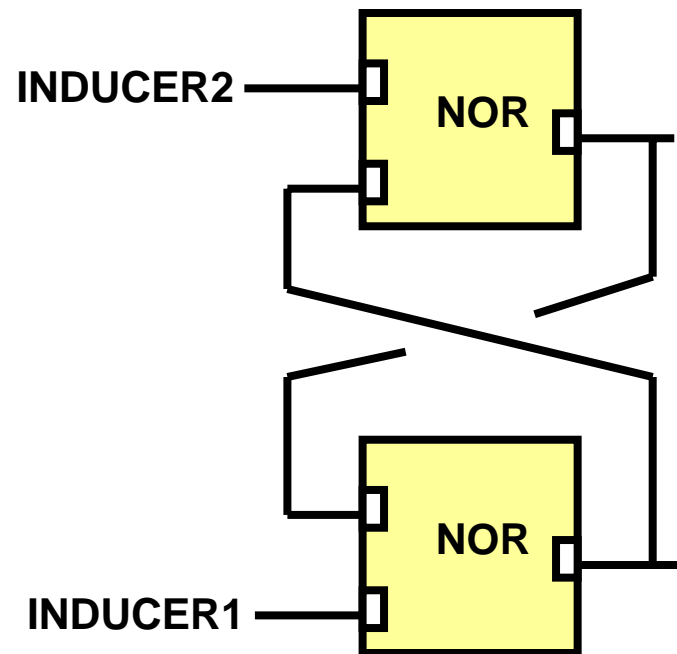
HIGHER LEVEL DEPICTION



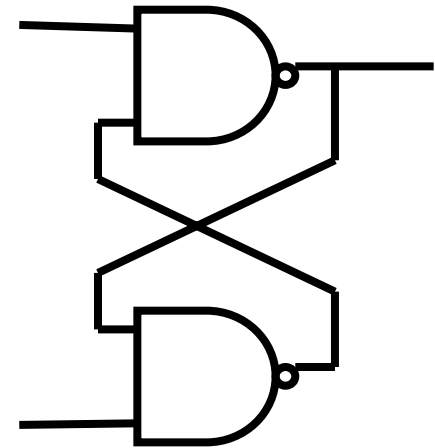
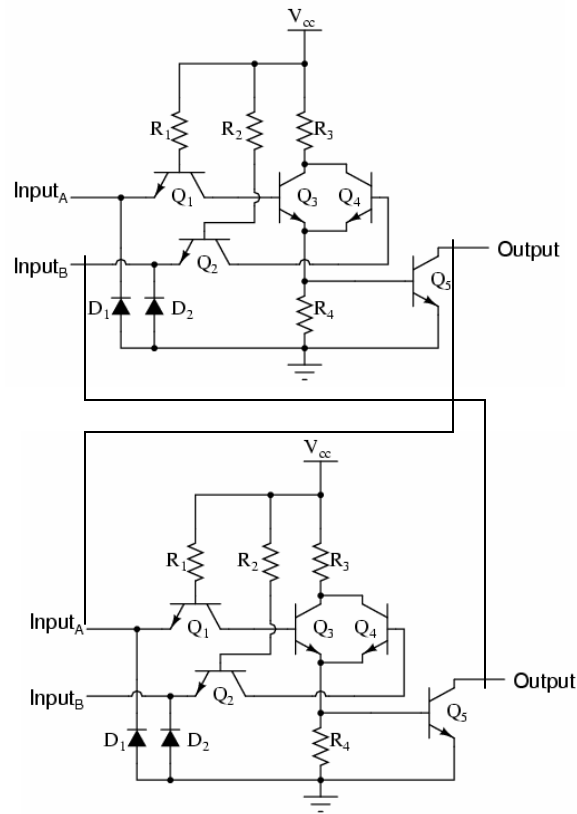
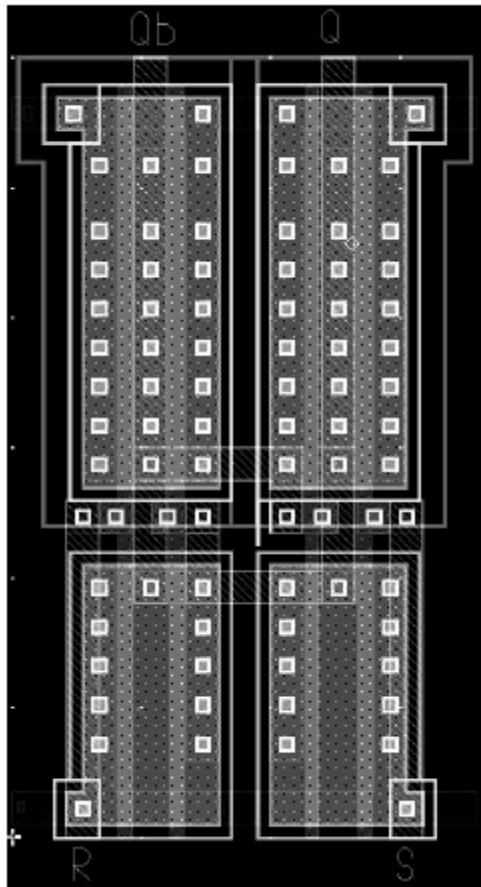
“CARTOON”



HIGHER LEVEL



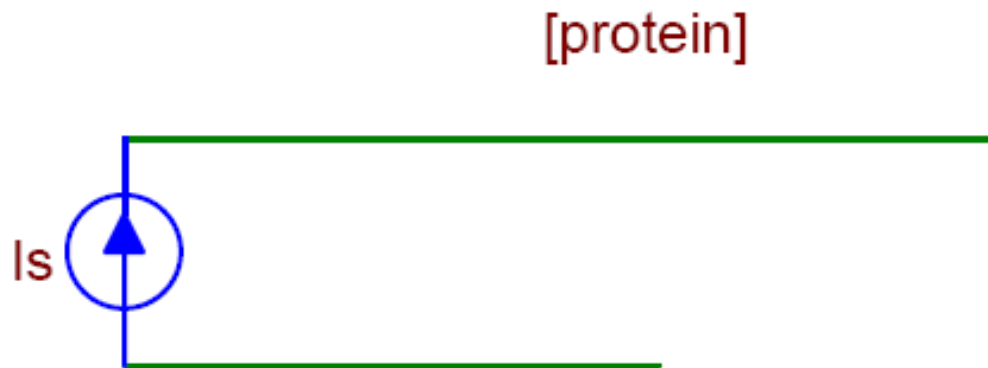
ELECTRONICS DEPICTIONS



SR Latch

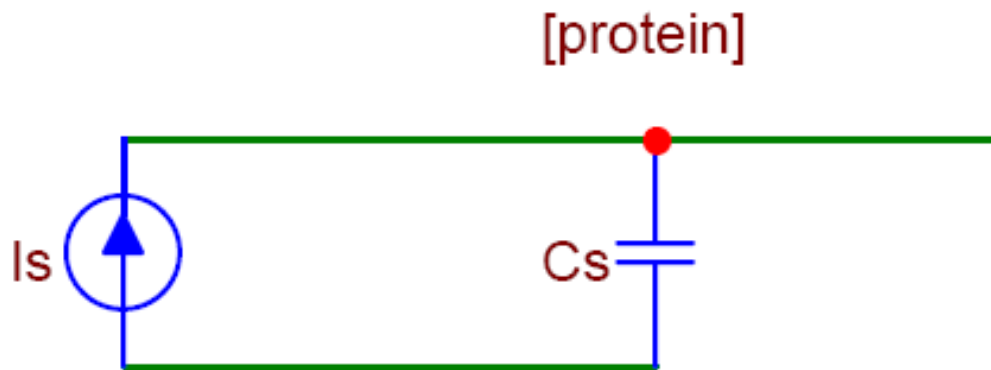
STAGE OUTPUT

- Output = Protein Concentration



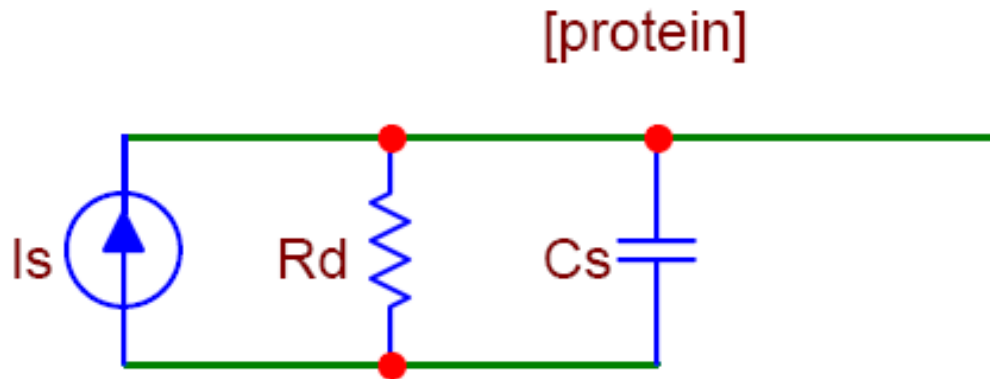
STAGE OUTPUT

- **Output = Protein Concentration**
 - **Accumulates in cell volume**



STAGE OUTPUT

- **Output = Protein Concentration**
 - Accumulates in cell volume
 - Removed by a degradation reaction whose rate is proportional to concentration



STAGE OUTPUT

- **Output = Protein Concentration**
 - Accumulates in cell volume
 - Removed by a degradation reaction whose rate is proportional to concentration
 - Level controls output of next stage

