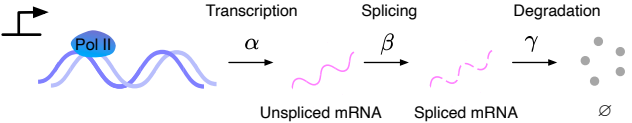
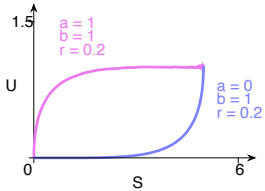
Velocity



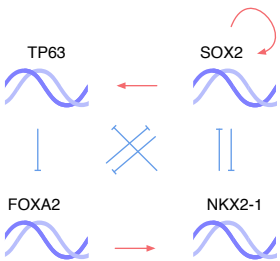
$$\frac{\mathrm{d}u}{\mathrm{d}t} = \alpha - \beta u(t)$$

$$\frac{\mathrm{d}s}{\mathrm{d}t} = \beta u(t) - \gamma s(t)$$

$$\varnothing \xrightarrow{\alpha} U \qquad U \xrightarrow{\beta} S \qquad S \xrightarrow{\gamma} \varnothing$$



Four regulatory factor networks



$$\frac{\mathrm{d}F}{\mathrm{d}t} = \frac{\alpha_F}{1 + a_1 T^2 + a_2 S^2} - d_F F$$

$$\frac{\mathrm{d}N}{\mathrm{d}t} = \alpha_N \frac{1 + F^2}{1 + a_3 F^2 + a_4 S^2} - d_N N$$

$$\frac{\mathrm{d}T}{\mathrm{d}t} = \alpha_T \frac{1 + S^2}{1 + a_5 S^2 + a_6 N^2} - d_T T$$

$$\frac{\mathrm{d}S}{\mathrm{d}t} = \beta_S \frac{S^2}{a_7^2 + S^2} + \frac{\alpha_S}{1 + a_8 F^2 + a_9 N^2} - d_S S$$

$$\varnothing \xrightarrow{\frac{\alpha_F}{1 + a_1 T^2 + a_2 S^2}} \text{FOXA2}$$

$$\varnothing \xrightarrow{\alpha_N \frac{1 + F^2}{1 + a_3 F^2 + a_4 S^2}} \text{NKX2-1}$$

$$\varnothing \xrightarrow{\alpha_T \frac{1 + S^2}{1 + a_5 S^2 + a_6 N^2}} \text{TP63}$$

$$\varnothing \xrightarrow{\beta_S \frac{S^2}{a_7^2 + S^2} + \frac{\alpha_S}{1 + a_8 F^2 + a_9 N^2}} \text{SOX2}$$

$$\text{FOXA2} \xrightarrow{d_F} \varnothing \qquad \text{NKX2-1} \xrightarrow{d_N} \varnothing \qquad \text{TP63} \xrightarrow{d_T} \varnothing \qquad \text{SOX2} \xrightarrow{d_S} \varnothing$$