lec16.tex

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1 Revisit R-E-S

$$\begin{aligned} \frac{\mathrm{d}E}{\mathrm{d}t} &= \beta_E f(R) - \alpha_E E \\ \frac{\mathrm{d}S}{\mathrm{d}t} &= \beta_S - \gamma_{ES} ES \end{aligned} \tag{1}$$

wherre R is "free R", not bound,

$$\frac{R_{free}}{k_{ER} + R_{free}} \tag{2}$$

R + S forms a complex RS. with

$$\frac{RS}{R_{tot}} = \frac{k_{RS}}{k_{RS} + S} \tag{3}$$

$$R\frac{k_{RS}}{k_{RS} + S} = \#R\text{not bound by S} \tag{4}$$

2 Combining feedback loops

iron uptake : (small RNA reg., RhyB, Fur (TF))