

0.1 Basic Kill Switch

$$\frac{d[C_{\text{Cas},1}]}{dt} = +k_{C_g}[P_{\text{Cas}}][G_1] - \delta_{C_g}[C_{\text{Cas},1}] \quad (1)$$

$$\frac{d[C_{\text{Cas},2}]}{dt} = +k_{C_g}[P_{\text{Cas}}][G_2] - \delta_{C_g}[C_{\text{Cas},2}] \quad (2)$$

$$\frac{d[P_{\text{Cas}}]}{dt} = \alpha_{p,P_{\text{Cas}}}V - \delta_{p,P_{\text{Cas}}}[P_{\text{Cas}}] + -k_{C_g}[P_{\text{Cas}}][G_1] + -k_{C_g}[P_{\text{Cas}}][G_2] \quad (3)$$

$$\frac{d[G_1]}{dt} = \alpha_{r,G_1}V - \delta_g[G_1] + -k_{C_g}[P_{\text{Cas}}][G_1] \quad (4)$$

$$\frac{d[G_2]}{dt} = \alpha_{r,G_2}V - \delta_g[G_2] + -k_{C_g}[P_{\text{Cas}}][G_2] \quad (5)$$

0.2 TF Kill Switch

$$\frac{d[C_{\text{Cas},1}]}{dt} = +k_{C_g}[P_{\text{Cas}}][G_1] - \delta_{C_g}[C_{\text{Cas},1}] \quad (6)$$

$$\frac{d[C_{\text{Cas},2}]}{dt} = +k_{C_g}[P_{\text{Cas}}][G_2] - \delta_{C_g}[C_{\text{Cas},2}] \quad (7)$$

$$\frac{d[P_{TF}]}{dt} = \alpha_{p,P_{TF}}V - \delta_{p,P_{TF}}[P_{TF}] - \delta_{p,P_{TF}}[P_{TF}] \quad (8)$$

$$\frac{d[P_{\text{Cas}}]}{dt} = \alpha_{p,P_{\text{Cas}}}V - \delta_{p,P_{\text{Cas}}}[P_{\text{Cas}}] + -k_{C_g}[P_{\text{Cas}}][G_1] + -k_{C_g}[P_{\text{Cas}}][G_2] \quad (9)$$

$$\frac{d[G_1]}{dt} = \alpha_{r,G_1}V - \delta_g[G_1] + -k_{C_g}[P_{\text{Cas}}][G_1] \quad (10)$$

$$\frac{d[G_2]}{dt} = \alpha_{r,G_2}V - \delta_g[G_2] + -k_{C_g}[P_{\text{Cas}}][G_2] \quad (11)$$