

$$\begin{aligned}
\frac{dL(t)}{dt} &= -\alpha_L L(t) + \beta_L P \left(1 - \left(\frac{P}{\gamma_L} \right)^2 \right) + \beta_L (A_P) \\
\frac{dP(t)}{dt} &= -\alpha_P P(t) + \beta_P L(t) + \beta_P \frac{A_L}{1 + \delta_P I_P(t)} \\
\frac{dI_P(t)}{dt} &= -\alpha_{IP} I_P(t) + \beta_{IP} P(t)
\end{aligned}$$