

①

$$E_0 = [E] + [ES] + [EI] \Rightarrow 0 = \frac{d[E]}{dt} + \frac{d[ES]}{dt} + \frac{d[EI]}{dt}$$

$$\left\{ \begin{array}{l} S_0 = [S] + [ES] \Rightarrow 0 = \frac{d[S]}{dt} + \frac{d[ES]}{dt} \quad \textcircled{2} \\ I_0 = [I] + [EI] \Rightarrow 0 = \frac{d[I]}{dt} + \frac{d[EI]}{dt} \quad \textcircled{3} \end{array} \right.$$

Steady State Presumptions:

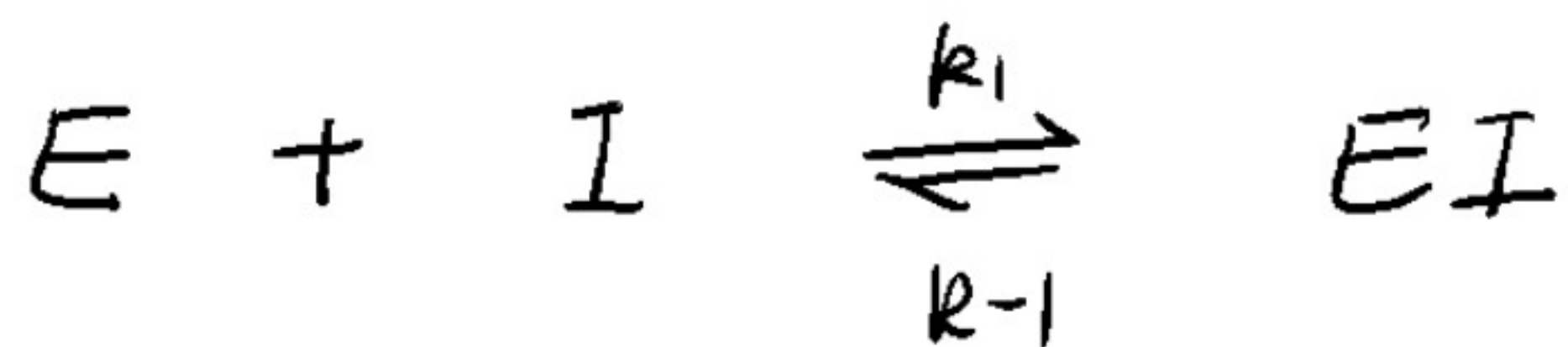
$$\frac{d}{dt}[ES] = 0, \quad \frac{d}{dt}[EI] = 0 \Rightarrow \frac{d}{dt}[E] = 0$$

$$\Downarrow \textcircled{2} \quad \Downarrow \textcircled{3}$$

$$\frac{d}{dt}[S] = 0 \quad \frac{d}{dt}[I] = 0 \quad \textcircled{4}$$

$$\left\{ \begin{array}{l} E_0 = [E] + [ES] + [EI] \quad \textcircled{1} \\ k_+[E][S] = k_-[ES] + k_{cat}[ES] \quad \textcircled{2} \\ k_{-1}[EI] = k_1[E][I] \quad \textcircled{3} \\ k_{-1}[EI] + k_-[ES] + k_{cat}[ES] = k_1[E][I] + k_+[E][S] \quad \textcircled{4} \end{array} \right.$$

以 $[E], [ES], [EI]$ 为变量, $E_0, [S], [I]$ 为参量的线性方程组 可求 $[ES]$ 进而求 $V_0 = k_{cat}[ES]$



$$k_1 [E][I] = k_{-1} [EI]$$

$$I_0 = [I] + [EI]$$

$$I_0 \approx [I] \Leftrightarrow [EI] \ll [I]$$

$$\frac{k_1}{k_{-1}} [E][I] \ll [I]$$

$$[E] \ll \frac{k_{-1}}{k_1}$$

常数
与 I_0 无关

$I_0 \approx [I]$ 成立只要求 $[E]$ 足够小
与 I_0 (抑制剂初始浓度) 无关。