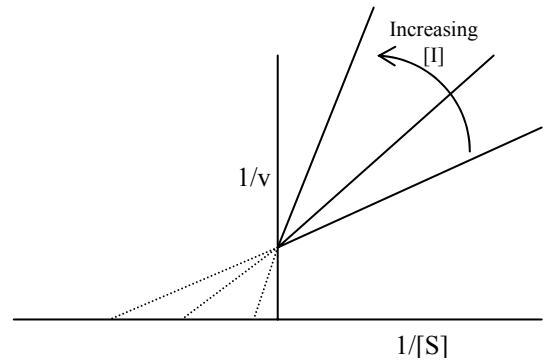
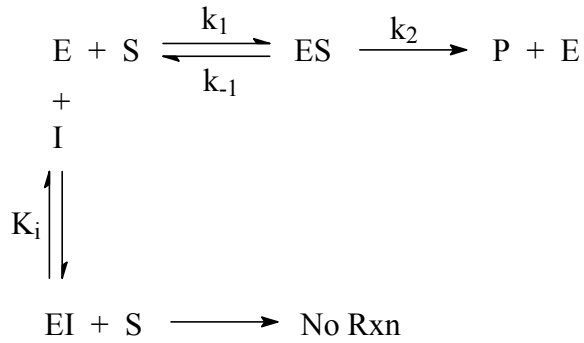
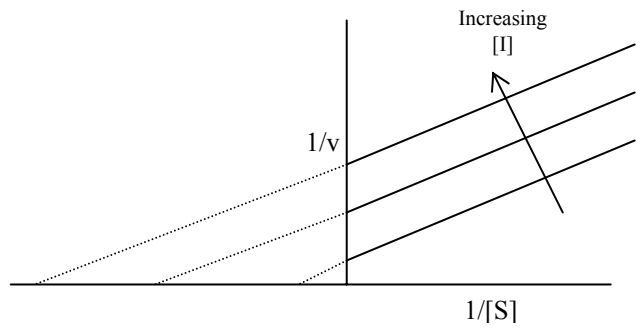
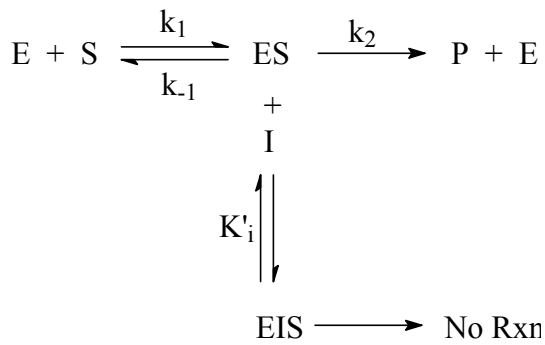


Modes of Inhibition & Their Patterns

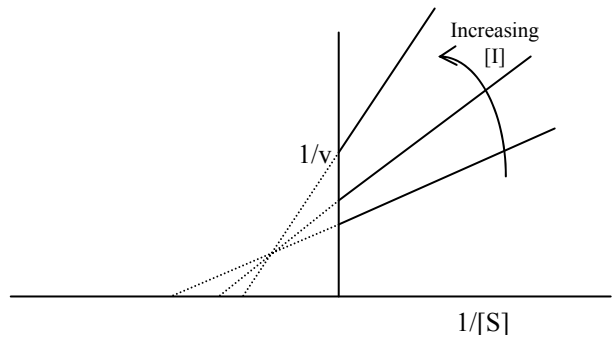
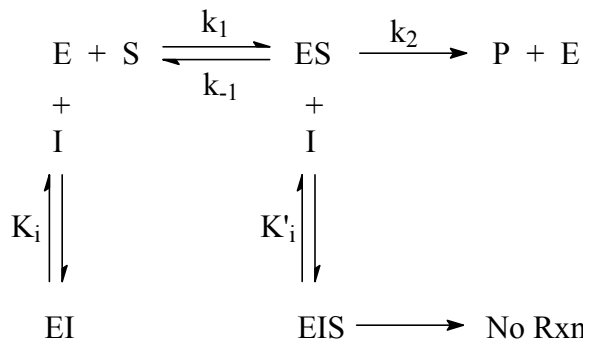
Competitive



Uncompetitive



Noncompetitive (mixed)



Determination of K_i

From changes in K_m (competitive & noncompetitive):

$$K_m^{app} = \left(1 + \frac{[I]}{K_i}\right) K_m$$

$$K_m^{app} = K_m + \frac{K_m}{K_i} [I]$$

$$y = b + mx$$

Therefore, plot K_m^{app} vs. $[I]$ and determine the slope (m) and intercept (b).

$$\frac{b}{m} = \frac{K_m}{\frac{K_m}{K_i}} = K_m \left(\frac{K_i}{K_m} \right) = K_i$$

From changes in V_{max} (uncompetitive and noncompetitive):

$$V_{max}^{app} = \frac{V_{max}}{1 + \frac{[I]}{K_i}}$$

$$\frac{1}{V_{max}^{app}} = \left(1 + \frac{[I]}{K_i}\right) \frac{1}{V_{max}}$$

$$\frac{1}{V_{max}^{app}} = \frac{1}{V_{max}} + \frac{1}{K_i V_{max}} [I]$$

$$y = b + mx$$

Therefore, plot $1/V_{max}^{app}$ vs. $[I]$ and determine the slope (m) and intercept (b).

$$\frac{b}{m} = \frac{\frac{1}{V_{max}}}{\frac{1}{K_i V_{max}}} = \frac{1}{V_{max}} (K_i V_{max}) = K_i$$