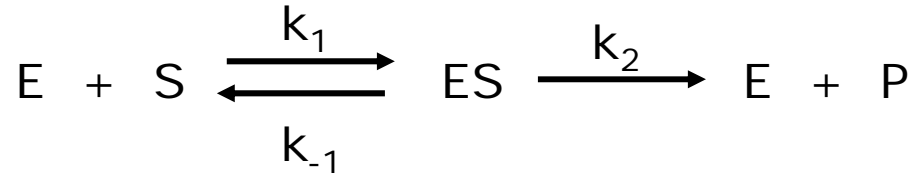


Michaelis-Menten Model

Michaelis-Menten式



前提

1. k_1 is a *fast* reaction, k_2 is a *slow* reaction.

2. $[S] \gg [E]$

ここで[ES] は平衡状態にあると仮定する

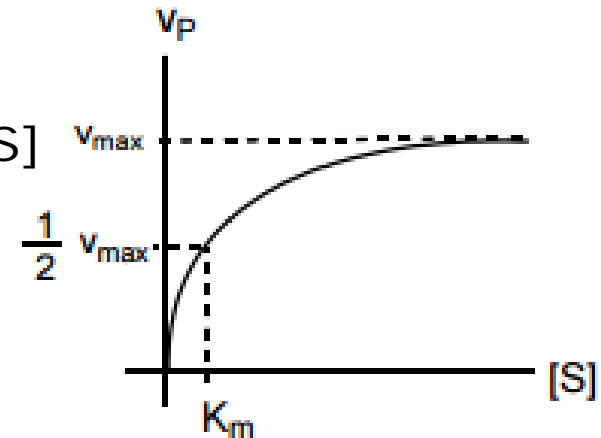
$$k_1[E][S] = k_2[ES] + k_{-1}[ES] = (k_2 + k_{-1})[ES]$$

$$k_1([E_{\text{tot}}] - [ES])[S] = (k_2 + k_{-1})[ES]$$

$$[ES] = (k_1 [E_{\text{tot}}][S]) / (k_1 [S] + k_2 + k_{-1})$$

$$[ES] = [E_{\text{tot}}][S] / ([S] + K_m)$$

where $K_m = (k_2 + k_{-1}) / k_1$



$$k_2[ES] = k_2[E_{\text{tot}}][S] / ([S] + K_m)$$

means

$$V_p = V_{\text{max}}[S] / ([S] + K_m)$$