

## Enzyme inhibition

The Michaelis-Menton rate of a reaction was given by

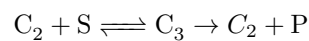
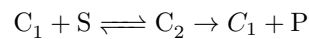
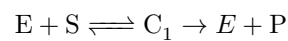
$$V = \frac{V_{max} \cdot s}{K_m + s}$$

We can rewrite this as

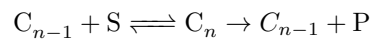
$$\frac{1}{V} = \frac{K_m + s}{V_{max} \cdot s} = \frac{K_m}{V_{max}} \cdot \frac{1}{s} + \frac{s}{s} \cdot \frac{1}{V_{max}}$$

The first term (of the last bit) goes to 0 close to the origin of the  $1/V$  x  $1/s$  plot, enabling the estimation of  $K_m$ .

## Cooperativity



model



By using the quasi-steady-state assumption, we get

$$V = \frac{dp}{dt} = \frac{V_{max} \cdot S^n}{K_m^n + S^n}$$

Hill's rate equation

For  $n$  large enough,  $V$  in Hill's equation becomes a sigmoidal curve

## xpp

$$\frac{dc}{dt} = k_1(a_0 - c - 2d) - k_2c - 2(k_3c^2k_4d)$$

$$d' = k_3c^2 - k_4d$$

```
#kinetics.ode
#simple enzyme model to fit some data
c'=k1*(a0-c-2d)-(k2*c-2*(k3*c*c-k4*d))
d'=k3*c*c-k4*d
init c=0, d=0
```