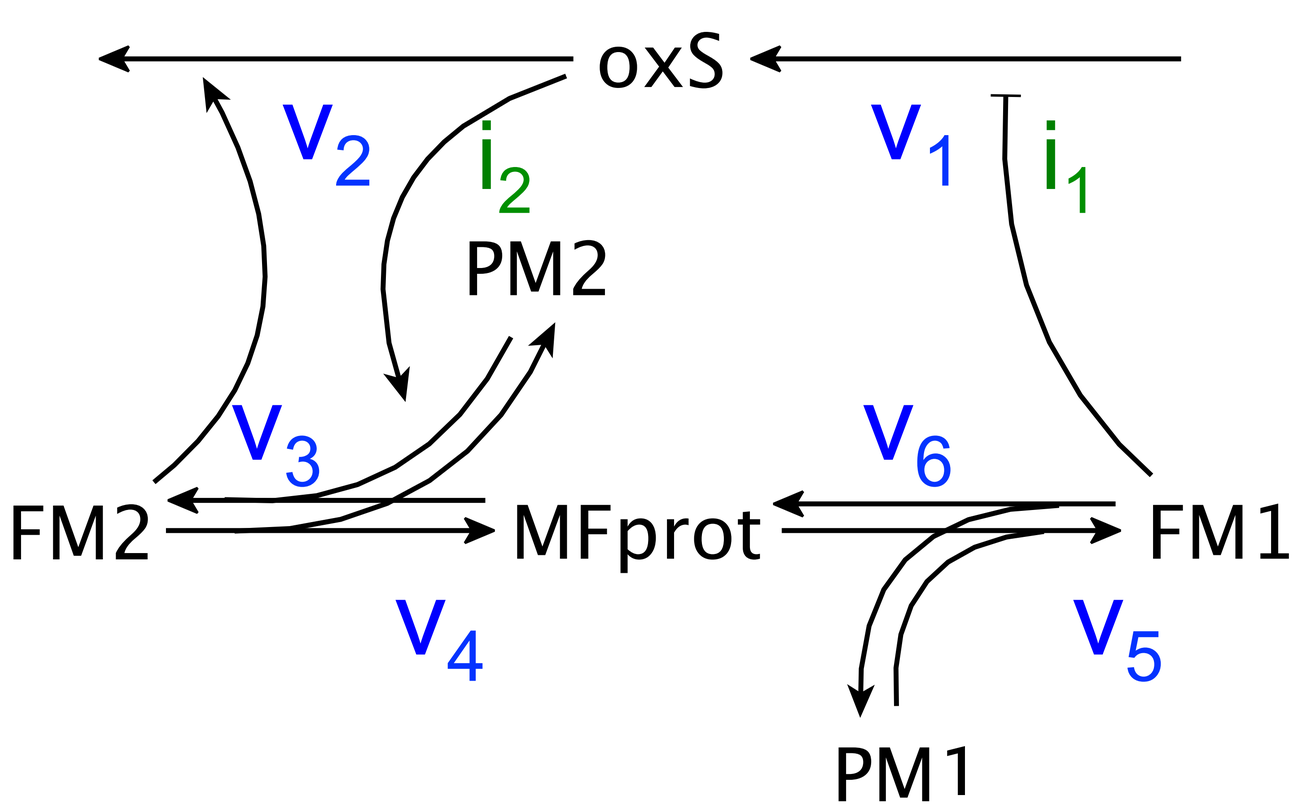

Rate process functions

Constant: $v6=k6$

Mass Action: $v6=k6 \times FM1$

Generalized MA: $v6=k6 \times FM1^{h_{FM1}}$

Michaelis-Menten: $v6=\frac{V6 \times FM1}{K_M6 + FM1}$

Hill activation: $v6=\frac{V6 \times FM1^{n1}}{K6^{n6} + FM1^{n1}}$

Hill inhibition: $v6=\frac{V6 \times K6^{n6}}{K6^{n6} + FM1^{n1}}$

Differential equations

$$KA2 = \frac{k3}{k4} \qquad KA1 = \frac{k5}{k6}$$

$$\frac{doxS}{dt} = v1 - v2$$

$$\frac{dPM1}{dt} = v6 - v5$$

$$\frac{dPM2}{dt} = v4 - v3$$

$$\frac{dMFprot}{dt} = v6 + v4 - v5 - v3$$

$$\frac{dFM1}{dt} = v5 - v6$$

$$\frac{dFM2}{dt} = v3 - v4$$

States (variables with dX/dt)

oxS
PM1, PM2,Mfprot
FM1, FM2

Parameters

$k_{1\text{-}6}$ (rate constants)
$K_{1\text{-}3}$ (kinetic parameters)
$n_{1\text{-}3}$

Rate process

MA + Hill inh

$$v1= k1 + \frac{K1^{n1}}{K1^{n1} + FM1^{n1}} \times Imax$$

$$v2= k2 \times oxS \times \frac{FM2^{n2}}{K2^{n2} + FM2^{n2}}$$ MA + Hill act

$$v3= k3 \times MFprot \times PM2 \times \frac{oxS^{n3}}{K3^{n3} + oxS^{n3}}$$

$v4= k4 \times FM2$ MA

$v5= k5 \times PM1 \times MFprot$ MA MA

$v6= k6 \times FM1$ MA