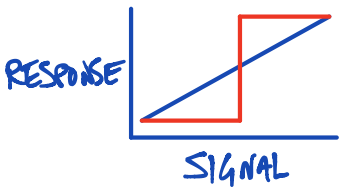
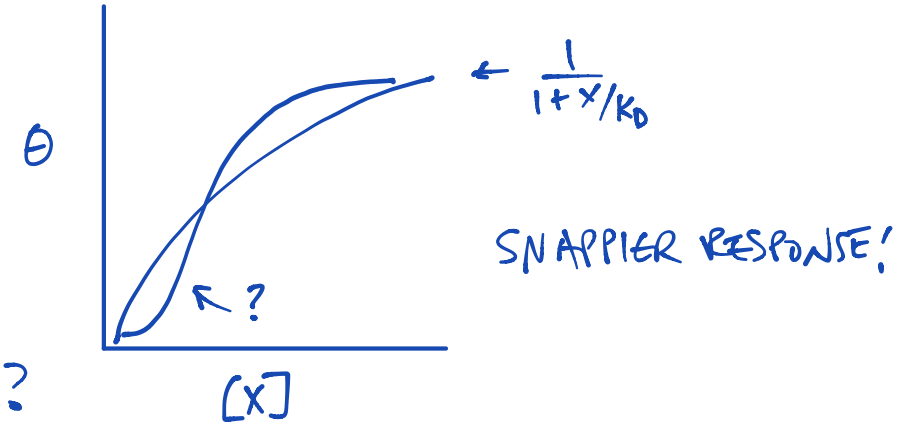
MONOD WYMAN CHANGEUX MODEL:



WHAT KINDS OF BIOLOGY MIGHT WANT ONE OR OTHER?



WHAT IS POINT OF PAPER?

- EXPLAIN PHENOMENON OF COOPERATIVITY

HOW DO THEY EXPLAIN?

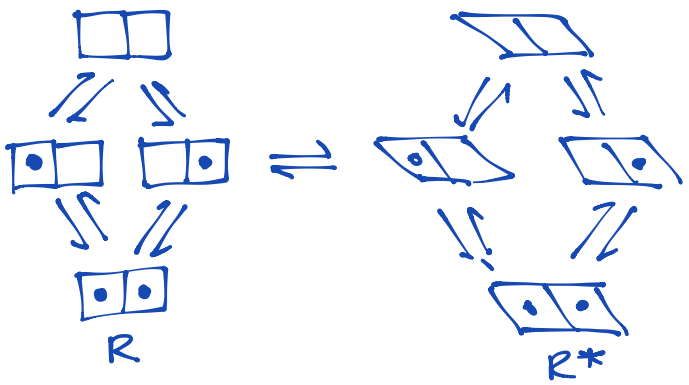
- SIMPLE, SYMMETRICAL MODEL

WHAT ARE ASSUMPTIONS ON p. 90

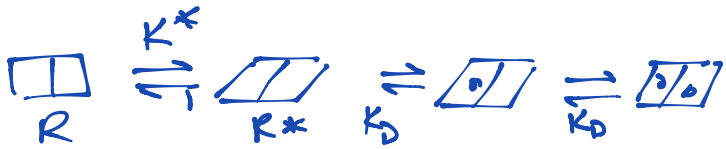
→ SYMMETRY
→ EACH PROTOMER FORMS ONE INTERACTION
→ PROTOMERS CONSTRAIN EACH OTHER
→ EXISTING EQUILIBRIUM
  → STATES HAVE DIFFERENT AFFINITY
  → SYMMETRY PRESERVED

] SITES ARE IDENTICAL

TWO SITE MODEL



A SIMPLIFIED MODEL



DERIVE EXPRESSION FOR θ.

$$Z = R + R^* + 2R^*X + R^*X_2$$

$$= R + R^* + 2\cdot\frac{R^*\cdot X}{K_D} + R^*\cdot X_2$$

$$= R + R^* + \frac{2R^*\cdot X}{K_D} + R^*\cdot\frac{X^2}{K_D^2}$$

$$R + R^*\left(1 + \frac{2X}{K_D} + \frac{X^2}{K_D^2}\right)$$

$$R + R^*\left(1 + \frac{X}{K_D}\right)^2$$

$$R + K^*\cdot R\left(1 + \frac{X}{K_D}\right)^2$$

$$Z = R\left(1 + K^*\left(1 + X/K_D\right)^2\right)$$

$$\theta = \frac{2R^*X + 2R^*X_2}{Z}$$

$$2\left[\frac{R^*X}{K_D} + \frac{R^*X^2}{K_D^2}\right]/Z$$

$$2\left[R^*\left(\frac{X}{K_D} + \frac{X^2}{K_D^2}\right)\right]/Z$$

$$2\left[K^*\cdot R\cdot\left(\frac{X}{K_D} + \frac{X^2}{K_D^2}\right)\right]/Z$$

$$2\left[K^*\cdot R\cdot\frac{X}{K_D}\left(1 + \frac{X}{K_D}\right)\right]/Z$$

$$\theta = \frac{2K^*\cdot R\cdot\frac{X}{K_D}\left(1 + X/K_D\right)}{R\left(1 + K^*\left(1 + X/K_D\right)^2\right)}$$

$$K_D = \frac{R^*\cdot X}{R^*X}$$

$$R^*X = \frac{R^*\cdot X}{K_D}$$

$$K_D = \frac{R^*X\cdot X}{R^*X_2}$$

$$R^*X_2 = \frac{R^*X\cdot X}{K_D}$$

$$R^*X_2 = \frac{R^*\cdot X\cdot X}{K_D\cdot K_D}$$

$$K^* = \frac{R^*}{R}$$

$$R^* = K^*\cdot R$$

$$\theta = \frac{2\cdot K^*\cdot\frac{X}{K_D}\left(1 + X/K_D\right)}{1 + K^*\left(1 + X/K_D\right)^2}$$

$$\theta = \frac{n \cdot K^* \cdot \frac{X}{K_D} \left(1 + X/K_D\right)^{n-1}}{1 + K^* \left(1 + X/K_D\right)^n}$$

WHAT HAPPENS AS $n \uparrow$?

ADD MORE SITES, STEEPER COOPERATIVITY

SWITCH-LIKE BEHAVIOR.

WHAT IF $K^* \gg 1$?

$\frac{n\, X/K_D}{1 + X/K_D}$ ← NORMAL BINDING CURVE

K^* MUST DISFAVOR BINDING

WHAT IF ASSUMPTIONS WRONG?

- SOME SORT OF NATURAL PHENOMENON
- MAYBE DOCTOR KNOWS PROBLEM, BUT NEEDS MAGIC WORDS TO GET THEM OUT

PEOPLE COME BACK

MODERN.

STRICT CODE. ONLY TAKE UNWANTED CREATURES.

MIND ZOO