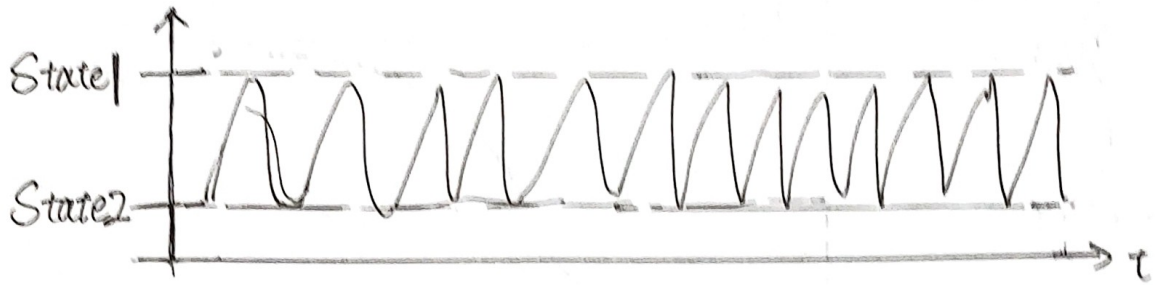
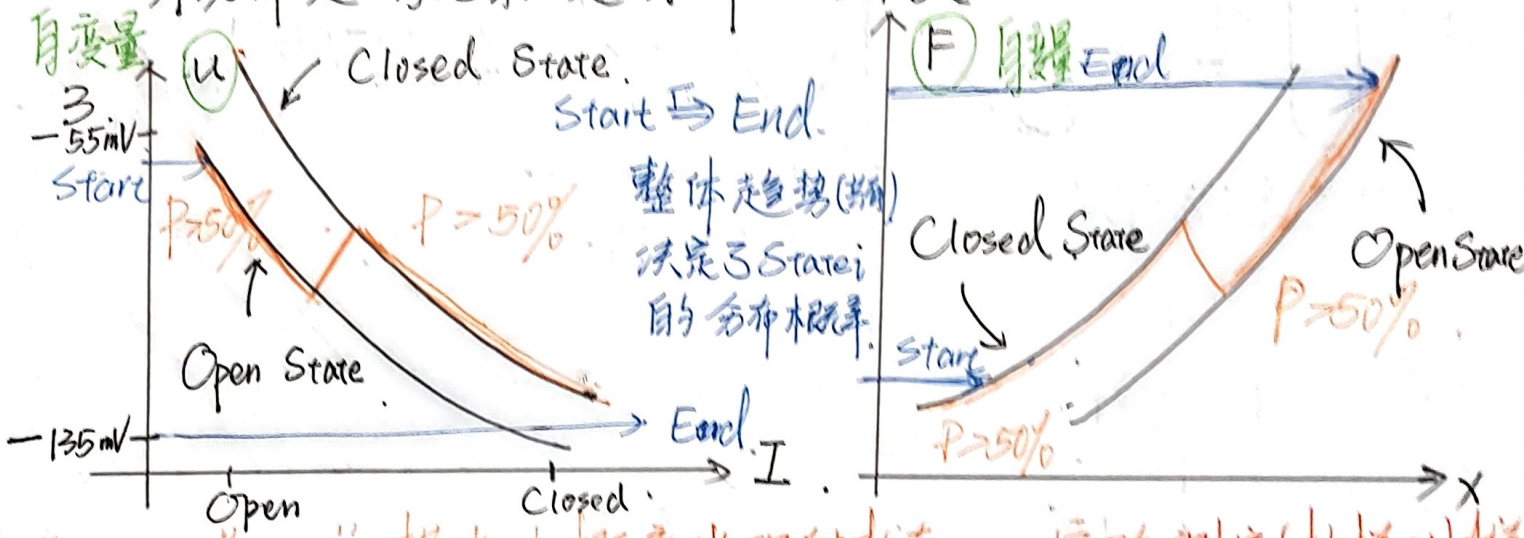
Two State System

1. 一定条件下(不变)，体系状态(随时间的变化)是随机的.



2. 但是 $P(State1) = F(x)$, $P(State2) = G(x)$

概率是确定的，是条件的函数



"—" 描出大概率出现的状态 ~ 实验测定(抽样时)概率

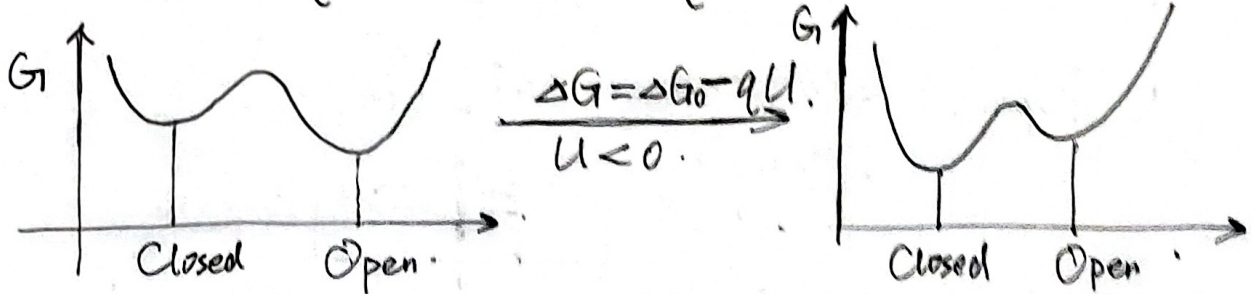
4. $A(Closed) \rightleftharpoons B(Open)$ ΔG. $K = \frac{[B]}{[A]}$

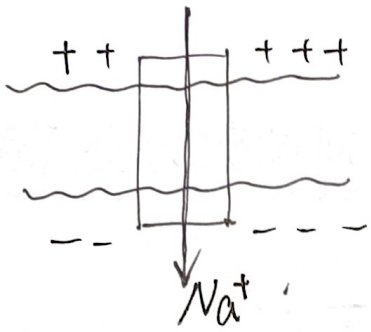
$$P_{open} = \frac{B}{A+B} = \frac{1}{1+\frac{A}{B}} = \frac{1}{1+K^{-1}}.$$

$$(K)^{-1} = \left(e^{-\frac{\Delta G}{KT}}\right)^{-1} = e^{\frac{\Delta G}{KT}} \Rightarrow P_{open} = \frac{1}{1+e^{\frac{\Delta G}{KT}}}$$

5. (1). Ion Channel.

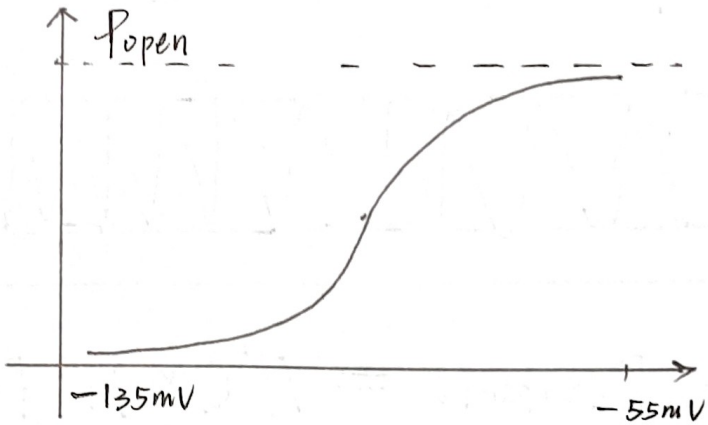
$\Delta G_0 = qU$., $(U<0)(q>0) \Rightarrow \Delta G_0 < 0$.





犹如蓄水池. 水坝自发打开.

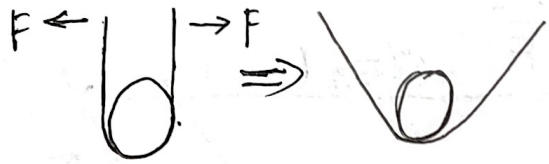
$\downarrow E_0$. $\uparrow E_{外}$ 用以抵消本原的电势能



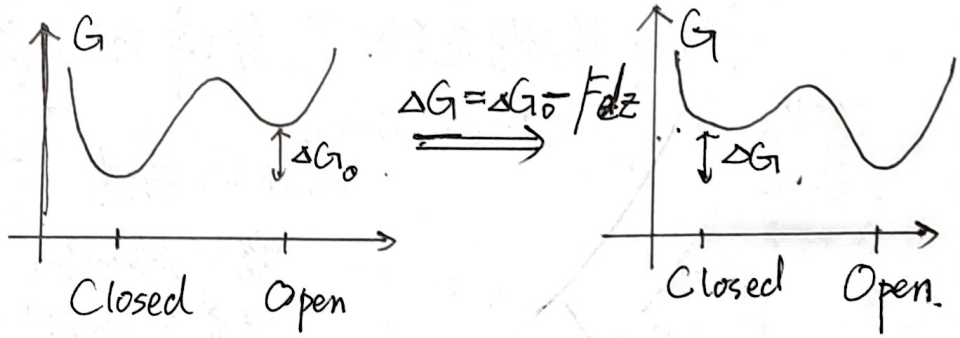
$$P_{open} = \frac{1}{1+e^{\frac{\Delta G}{kT}}}$$

$$P_{open} = \frac{1}{1+e^{\frac{\Delta G_0 - qU}{kT}}}$$

(2) Nucleasome

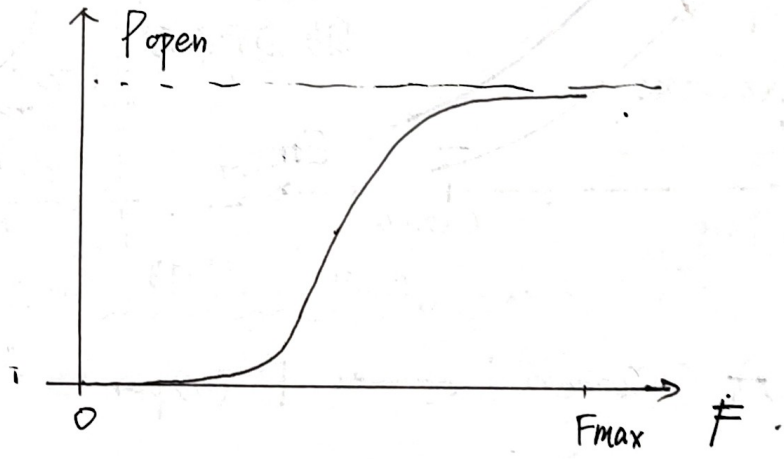


打开需要输能量.



$$P_{open} = \frac{1}{1+e^{\frac{\Delta G}{kT}}}$$

$$P_{open} = \frac{1}{1+e^{\frac{\Delta G_0 - Fdz}{kT}}}$$



(3) Hairpin

与 Nucleasome 同理.

(4) 对比.

- Popen. 在 Ion Channel 的↑: $\Delta G_0 < 0$. $\Delta G = \Delta G_0 - qU$. 取负值.
  - $U \uparrow \Leftrightarrow$ 外力影响↓.
- Popen 在 {Nucleasome. Hairpin.} 的↑: $\Delta G_0 > 0$. $\Delta G = \Delta G_0 - Fdz$ 取正值.
  - $F \uparrow \Leftrightarrow$ 外力影响↑.