Membrane Partitioning/Membrane Binding

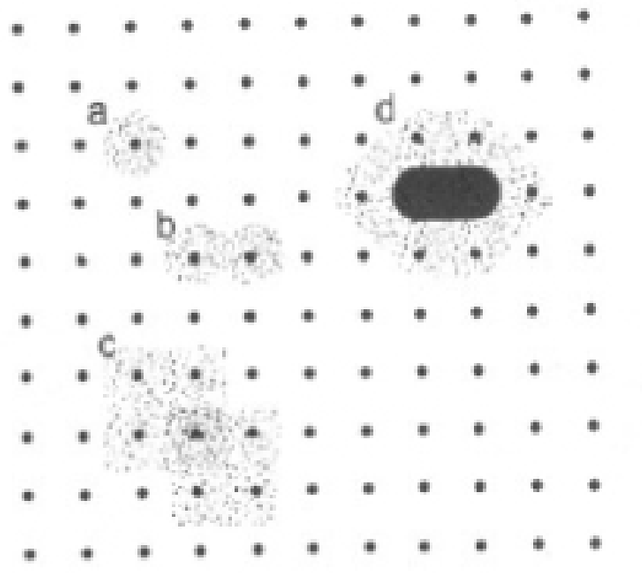
Binding to Proteins:

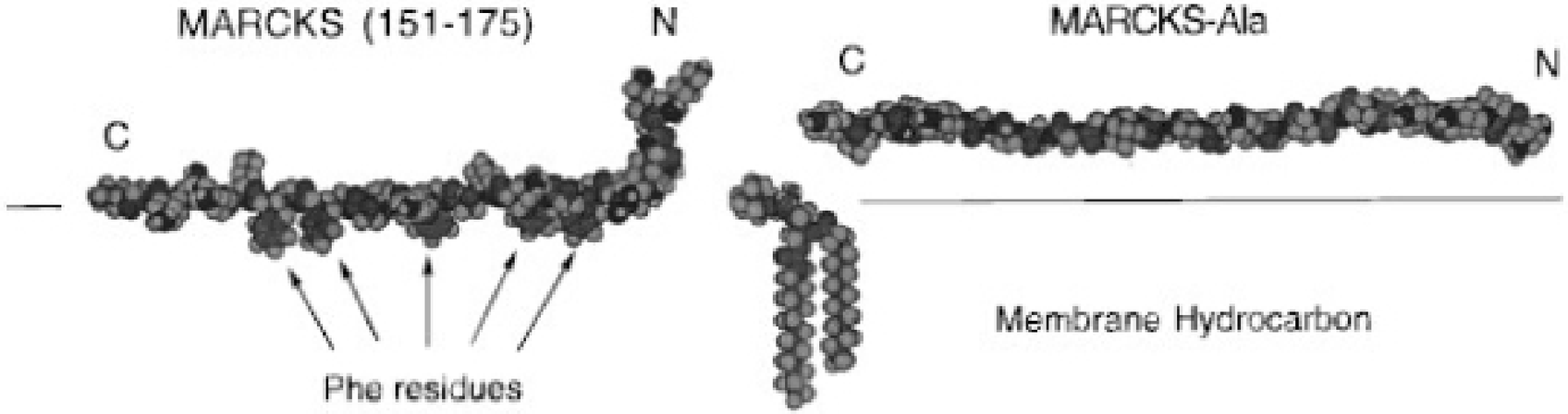
- Specific well defined binding sites
- Number of binding sites per molecule
- Strength of the interaction
- cooperativity

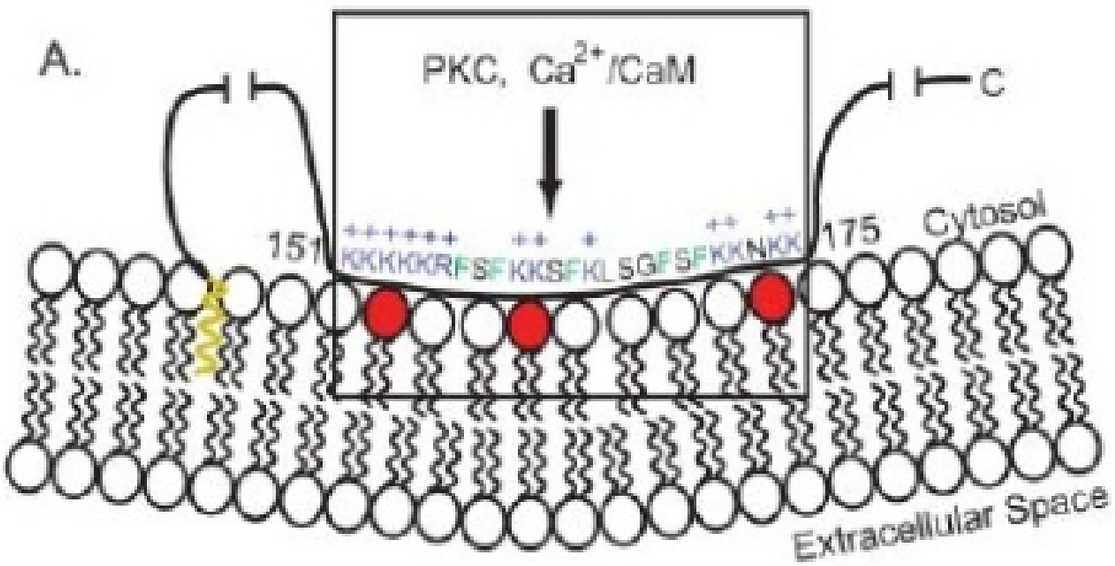
Adsorption of Ions and Amphipathic molecules to bilayers is not always as straightforward – binding site may not be as well defined. There may be specific ligands, there may be hydrophobic partitioning, or electrostatic attraction

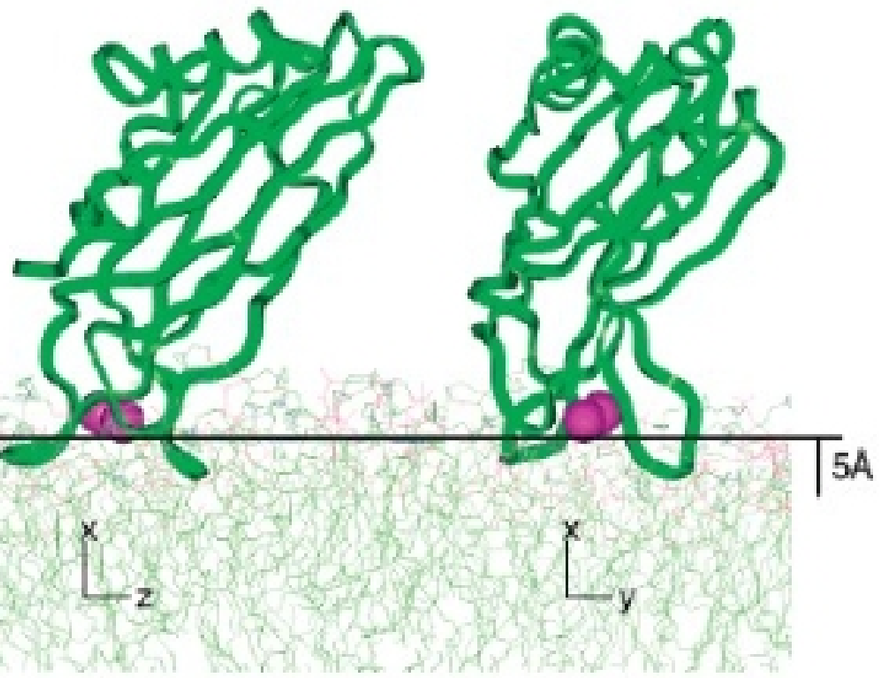
Different Models of Binding:

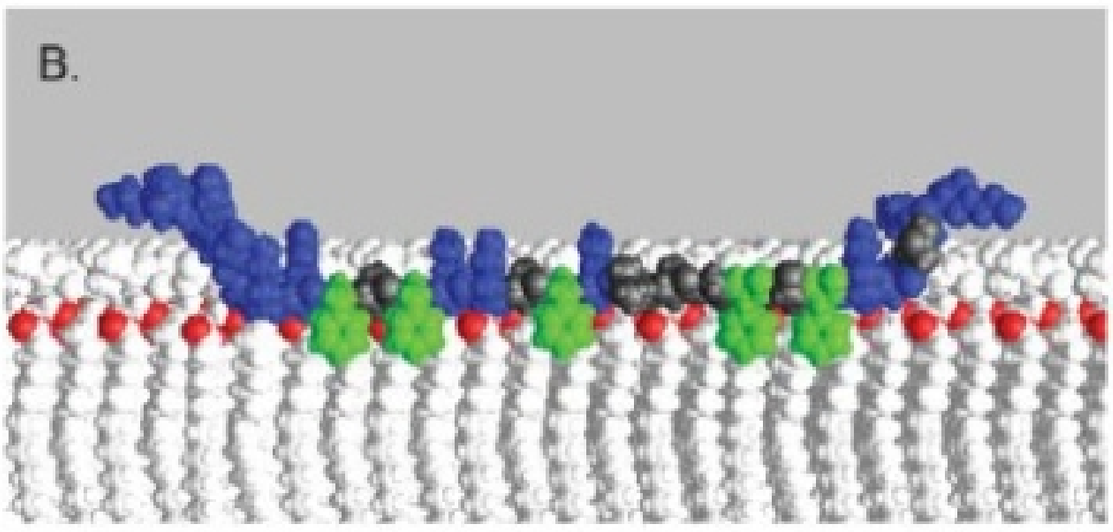
Partition Equilibrium
Langmuir Adsorption Isotherms
Complexation to N Lipids











What do we mean by BINDS?

Partition Equilibrium

$P + L \rightarrow PL$

P = small molecule (protein etc)
L = lipid, lipid is considered a separate phase

Partitioning Coefficient: Kp = Cb/Cf

Where Cb is the concentration of bound molecule (PL), Cf is the concentration of free molecule in solution (P).

Binding Isotherms are typically analyzed by measuring either the amount of the free ligand in solution or that bound to the bilayer and knowing the total concentration of lipid.

An expression was given in Fridays paper presentation:

$$c_{\mathrm{D,b}} = c_{\mathrm{D}}^{\circ} \frac{K c_{\mathrm{L}}^{\circ}}{1 + K c_{\mathrm{L}}^{\circ}}$$

Typically you derive an expression in terms of known total amounts, measure one parameter to determine a binding constant