

Mechanisms of selectivity of transport through biological channels: syllabus

Lecture 1

- Background. Examples of transport channels. Active transporters: pumps. Passive transporters involving conformational change: voltage and ligand gated ion channels, ligand specific receptors. Passive ,'always open' channels: ion pores, porins and nuclear pore complex. Similar systems: enzymes.
- More details 'always-open' channels. General features: binding strength of the ligands to the channel determines the selectivity. Differences and similarities between different transport devices.
- General theory of stochastic, diffusion based transport through narrow channels. Continuum and discrete models.

Lecture 2

- General theory: continued. Selectivity as a balance between the transport speed and transport efficiency.
- Detailed discussion of two systems: nuclear pore complex and bacterial porins.
- Discussion of the applications of the theory to other systems.