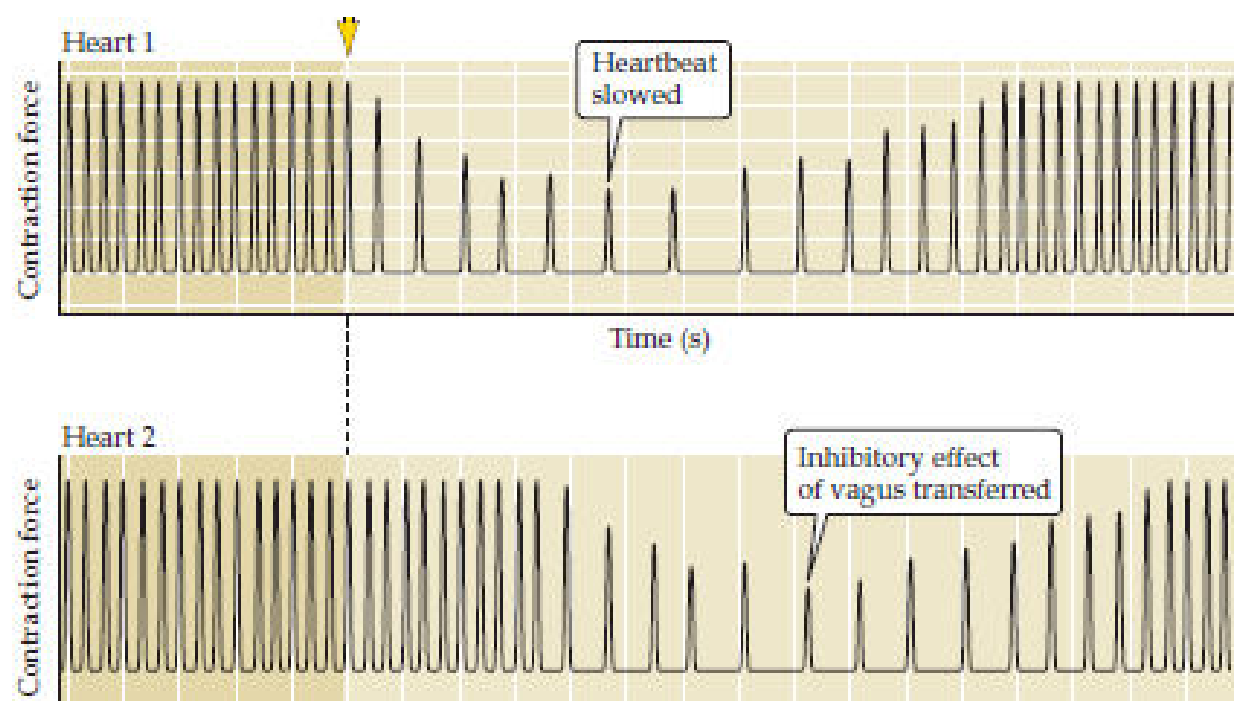
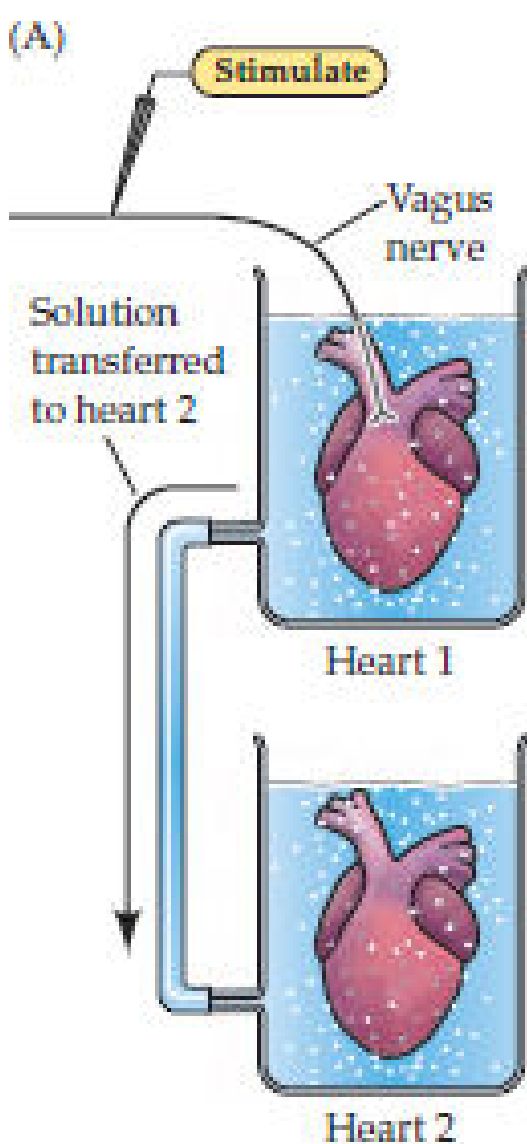


Synapse

Synaptic transmission

Otto Loewi 1926



Synapse Types

- Anatomical

Axodendritic, axosomatic, axoaxonic

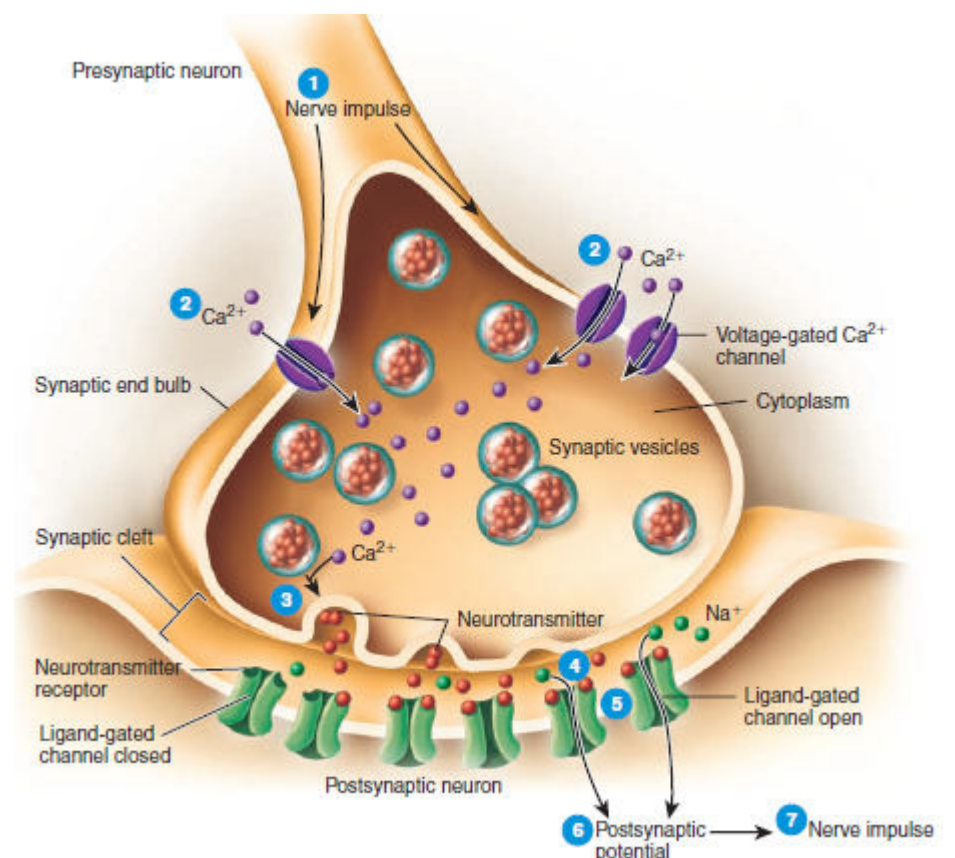
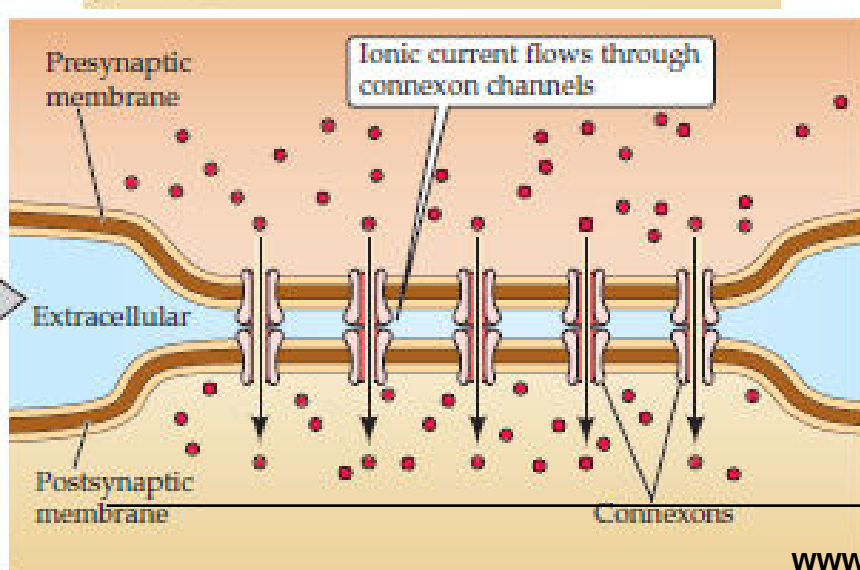
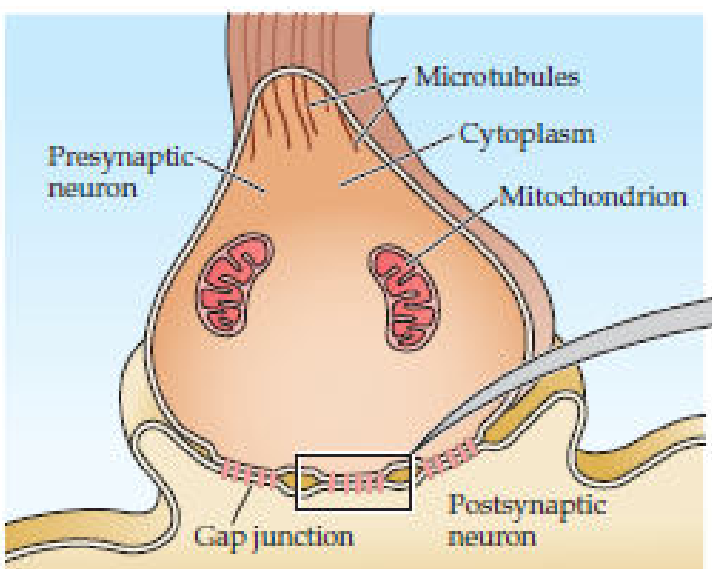
- Physiological

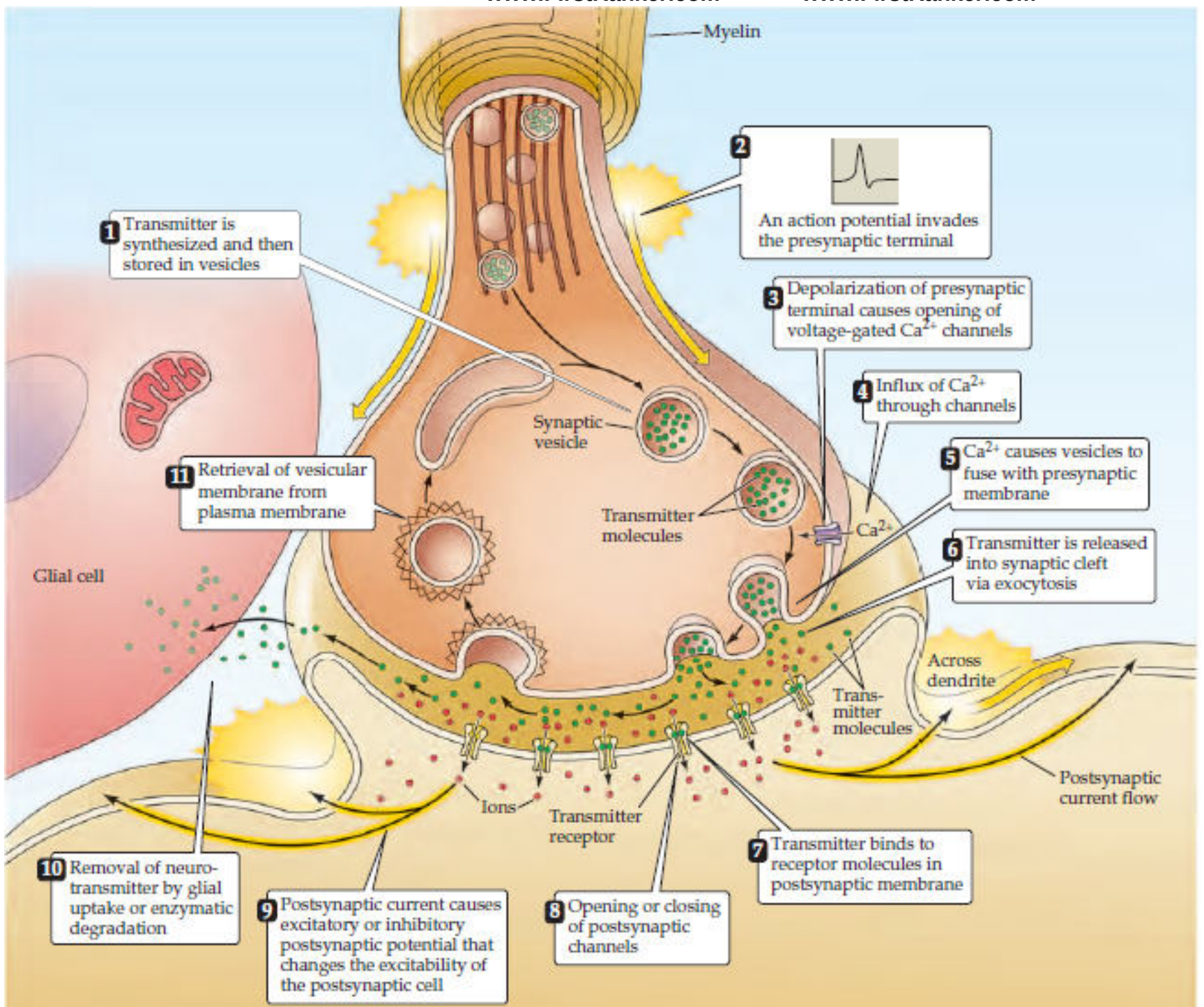
Electrical, chemical

- Functional

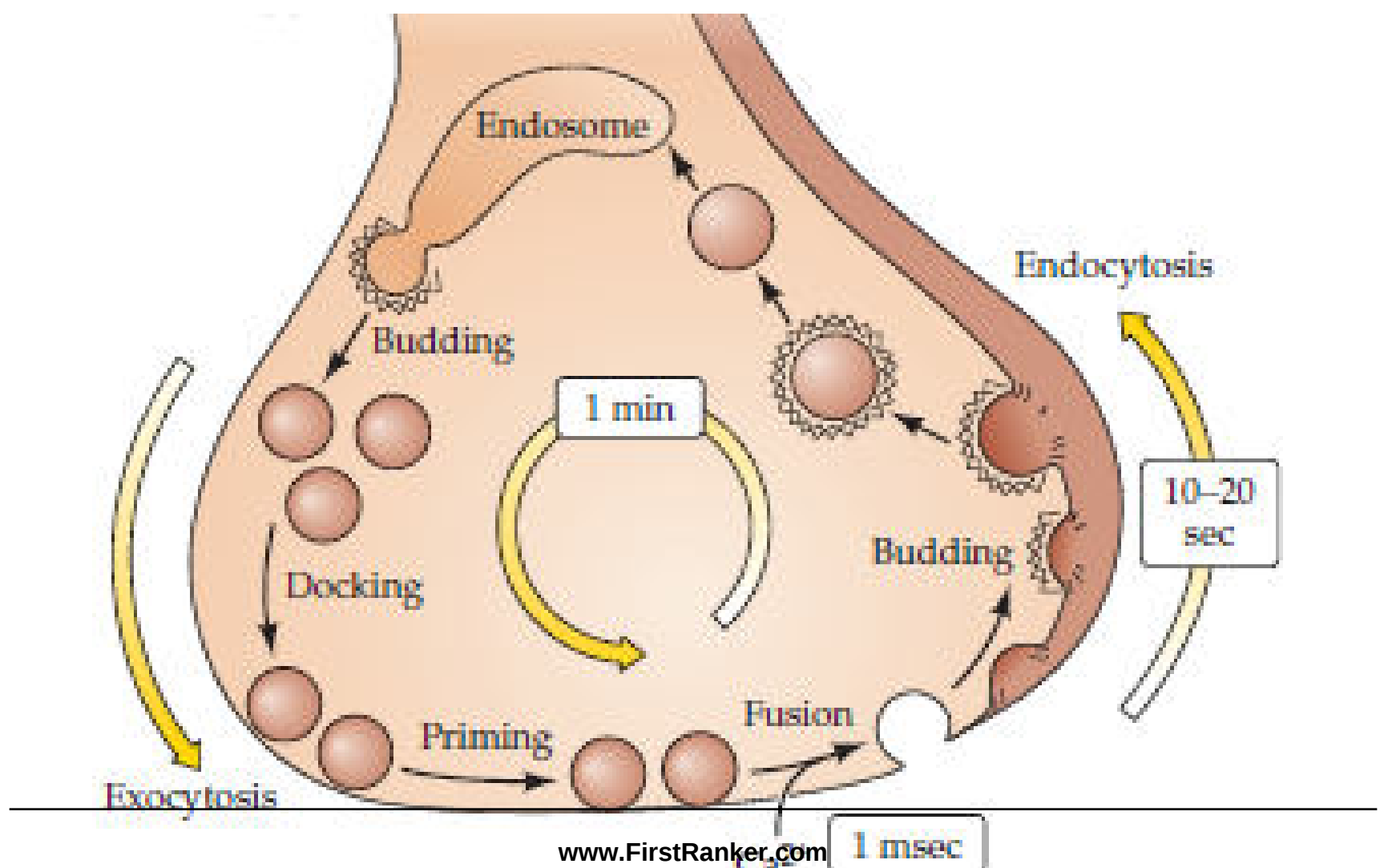
Excitatory, inhibitory, **modulatory**

Electrical vs Chemical Synapse

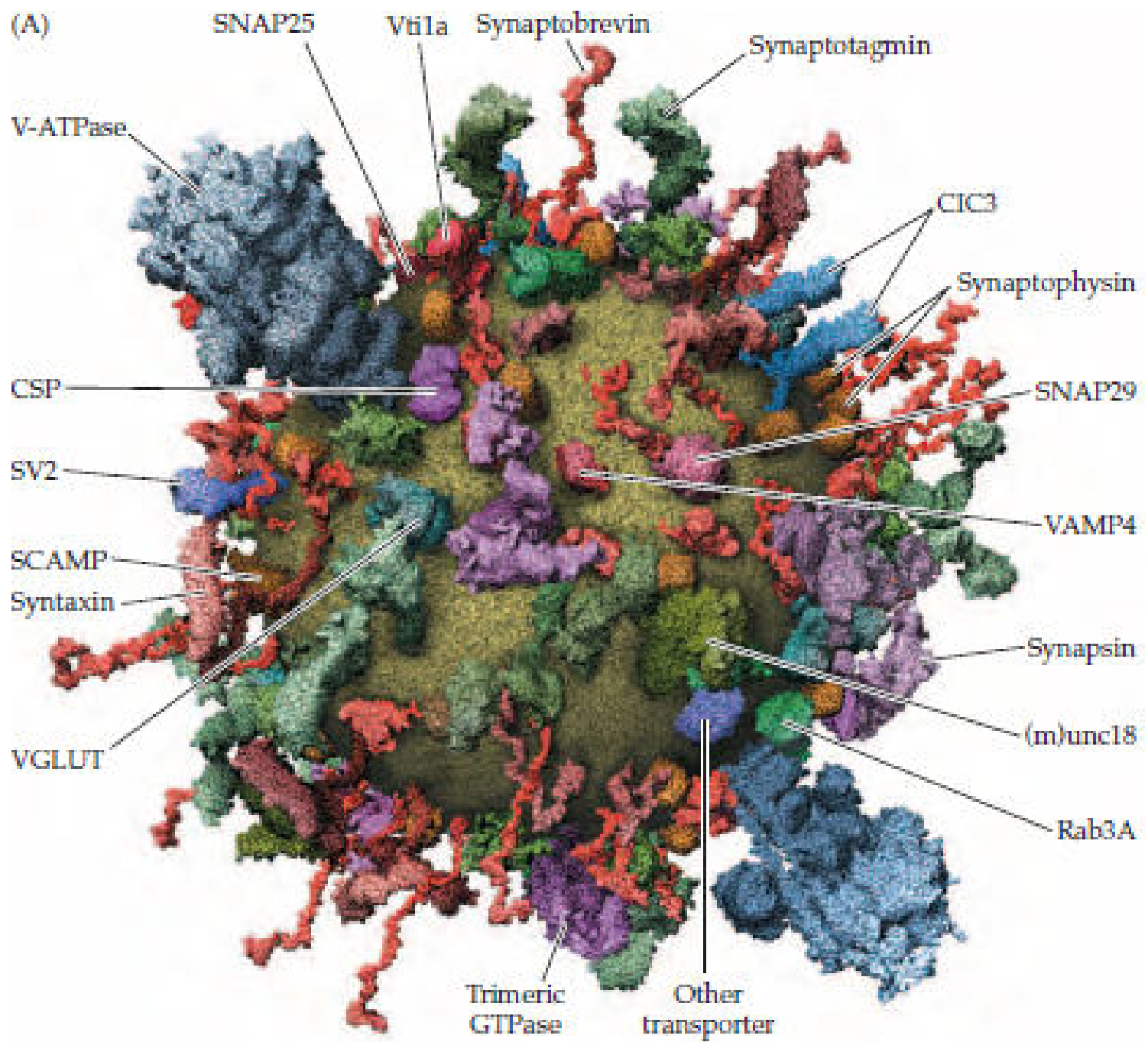




Vesicle recycling

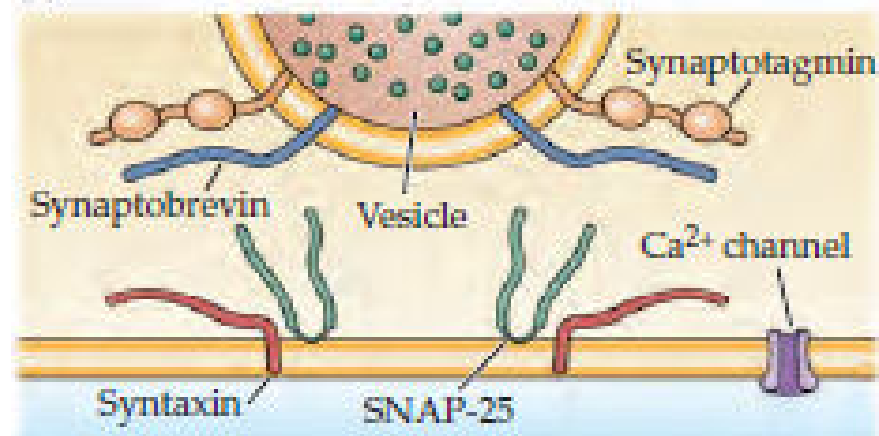


Synaptic vesicle

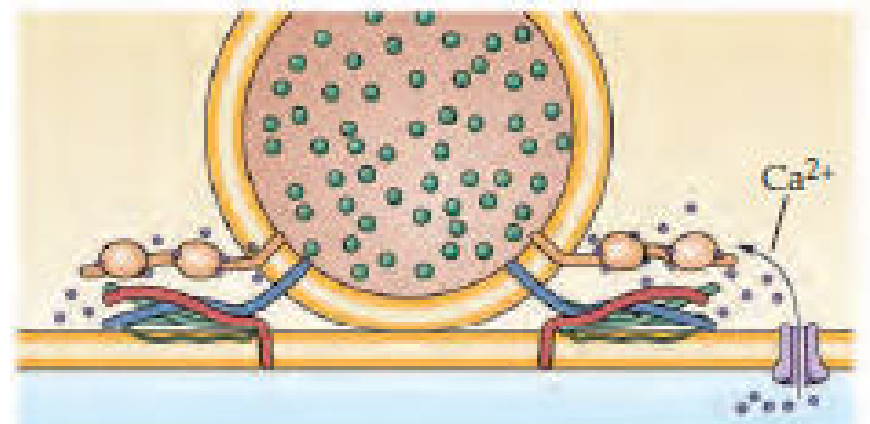


Mechanism of NT release

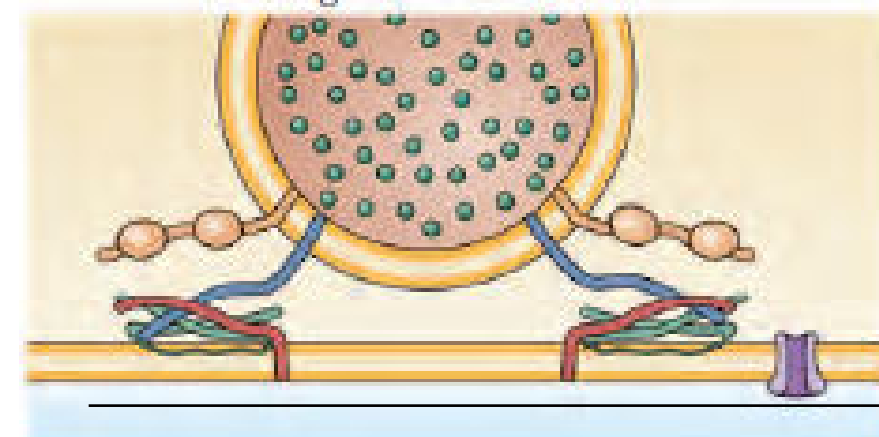
(1) Vesicle docks



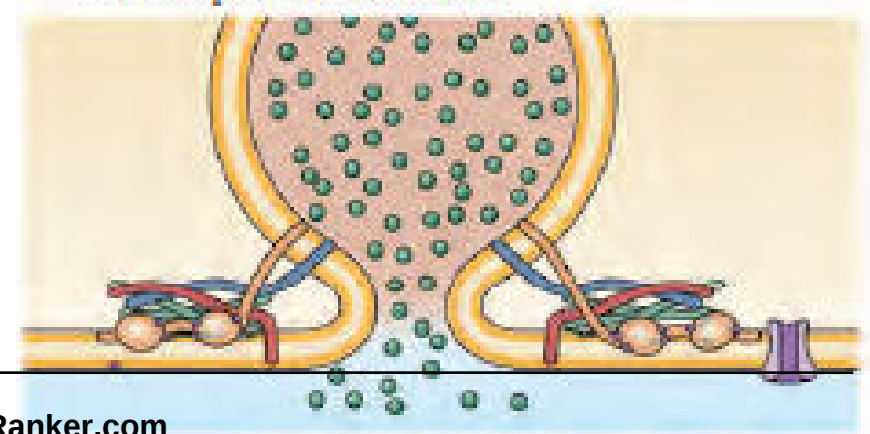
(3) Entering Ca²⁺ binds to synaptotagmin



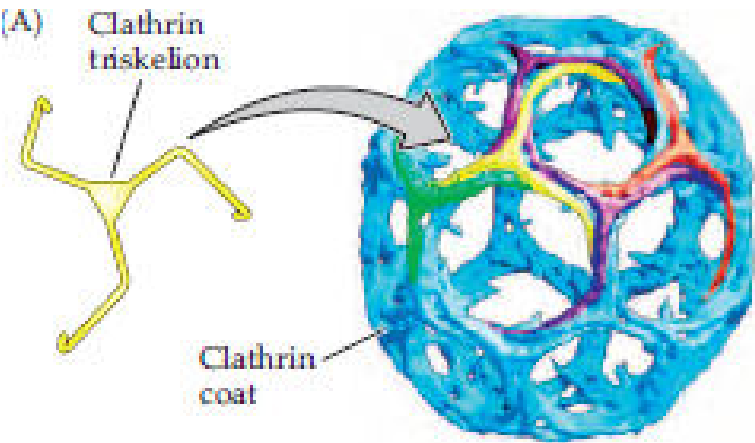
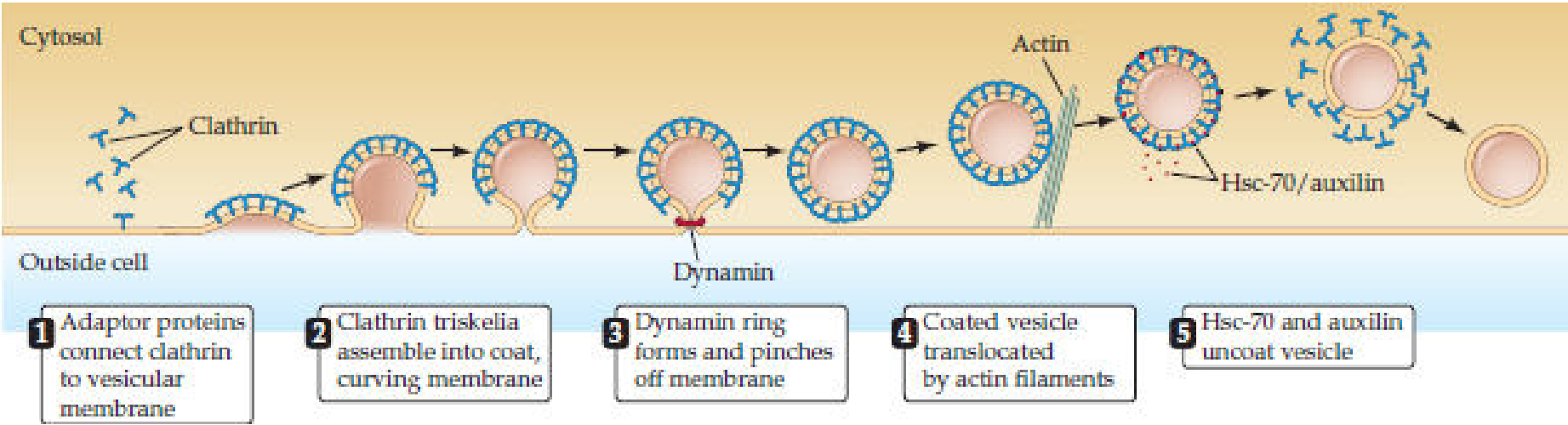
(2) SNARE complexes form to pull membranes together



(4) Ca²⁺-bound synaptotagmin catalyzes membrane fusion by binding to SNAREs and the plasma membrane

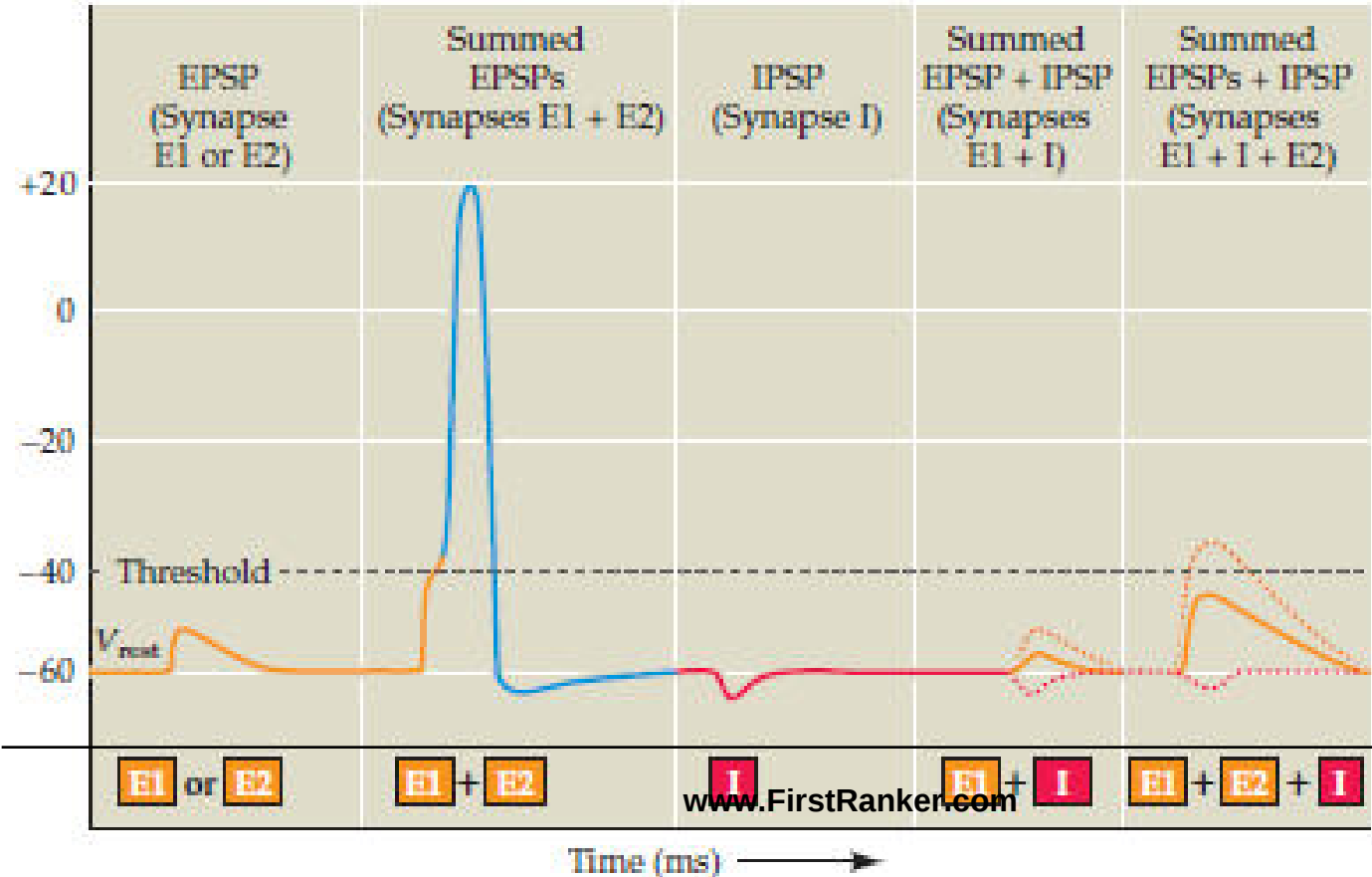
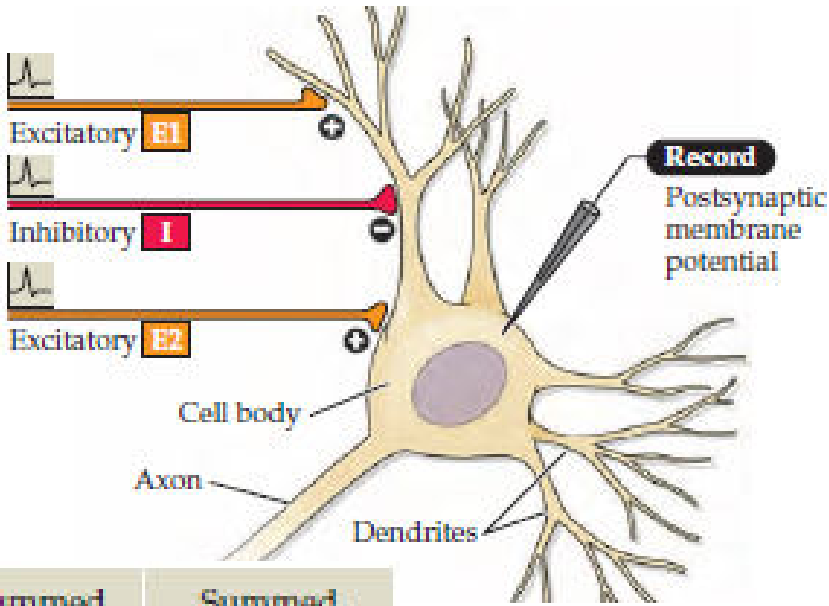


Endocytosis (vesicle formation)



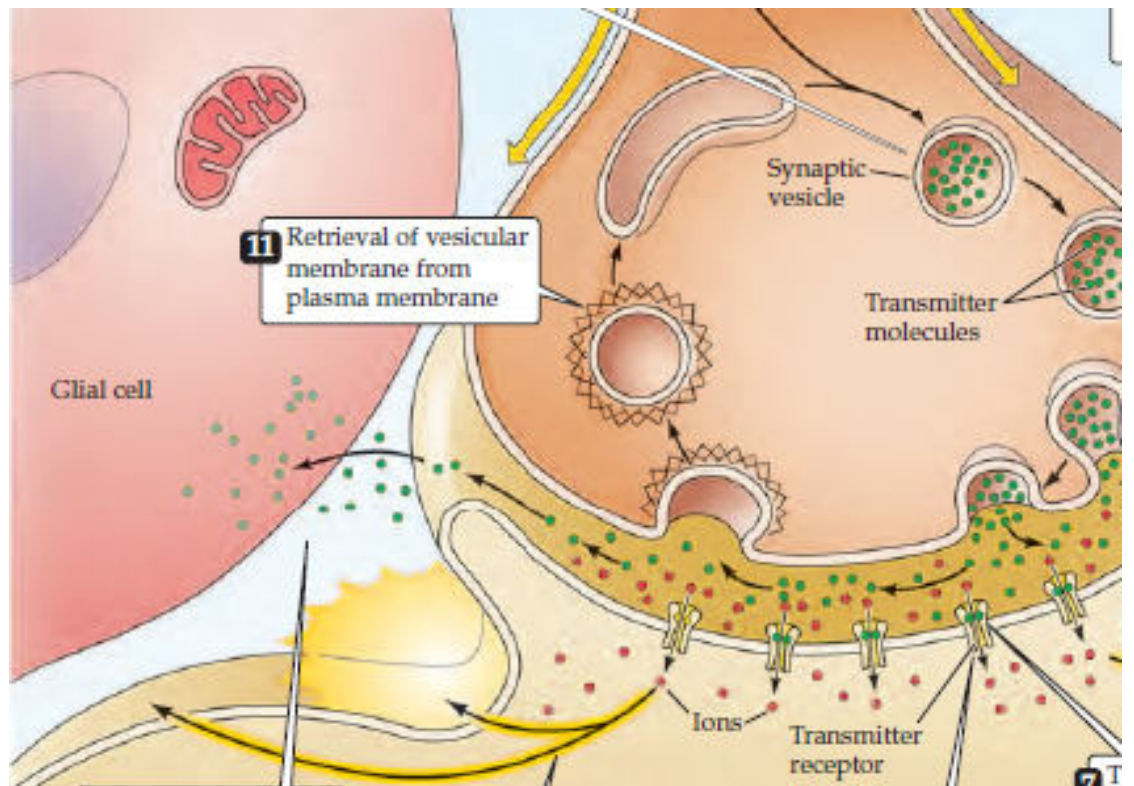
Post Synaptic Potential

- EPSP
- IPSP



Fate of Neurotransmitter

- Enzymatic degradation
- Glial cell uptake
- Diffusion
- Presynaptic uptake



Properties

- Delay
- One way conduction
- Summation- temporal / spatial
- Facilitation
- Occulusion
- Synaptic inhibition –
presynaptic,
postynaptic
feedback (renshaw cell)
feedforward

