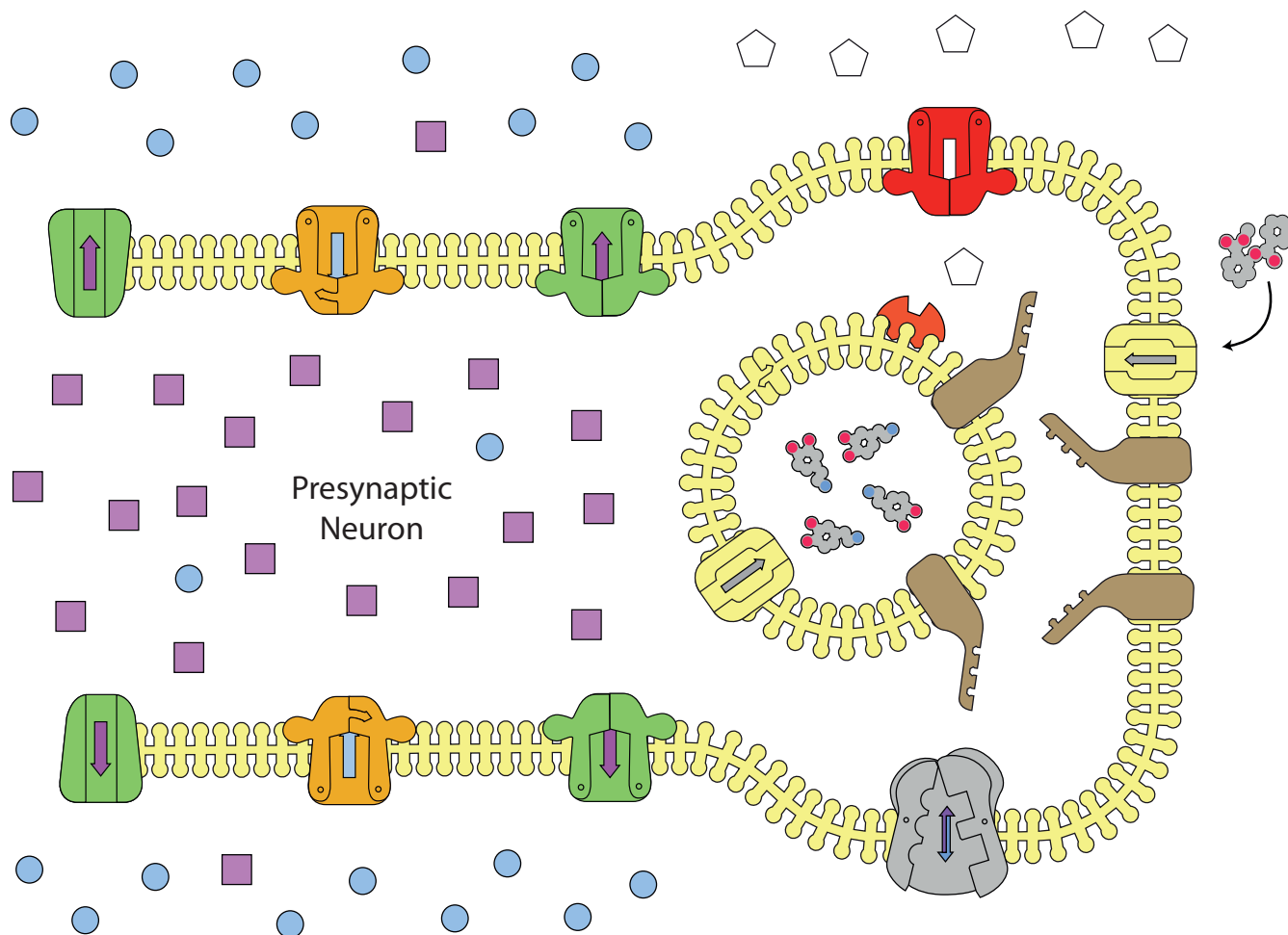
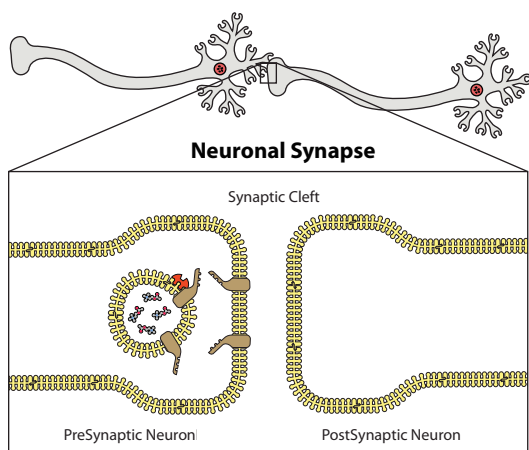
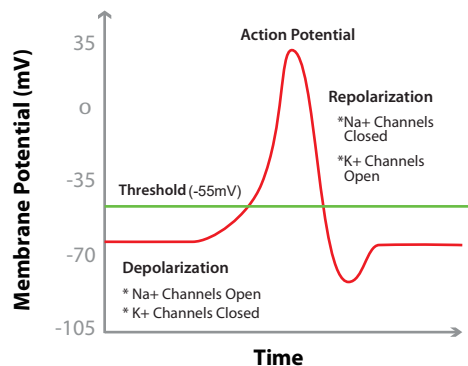
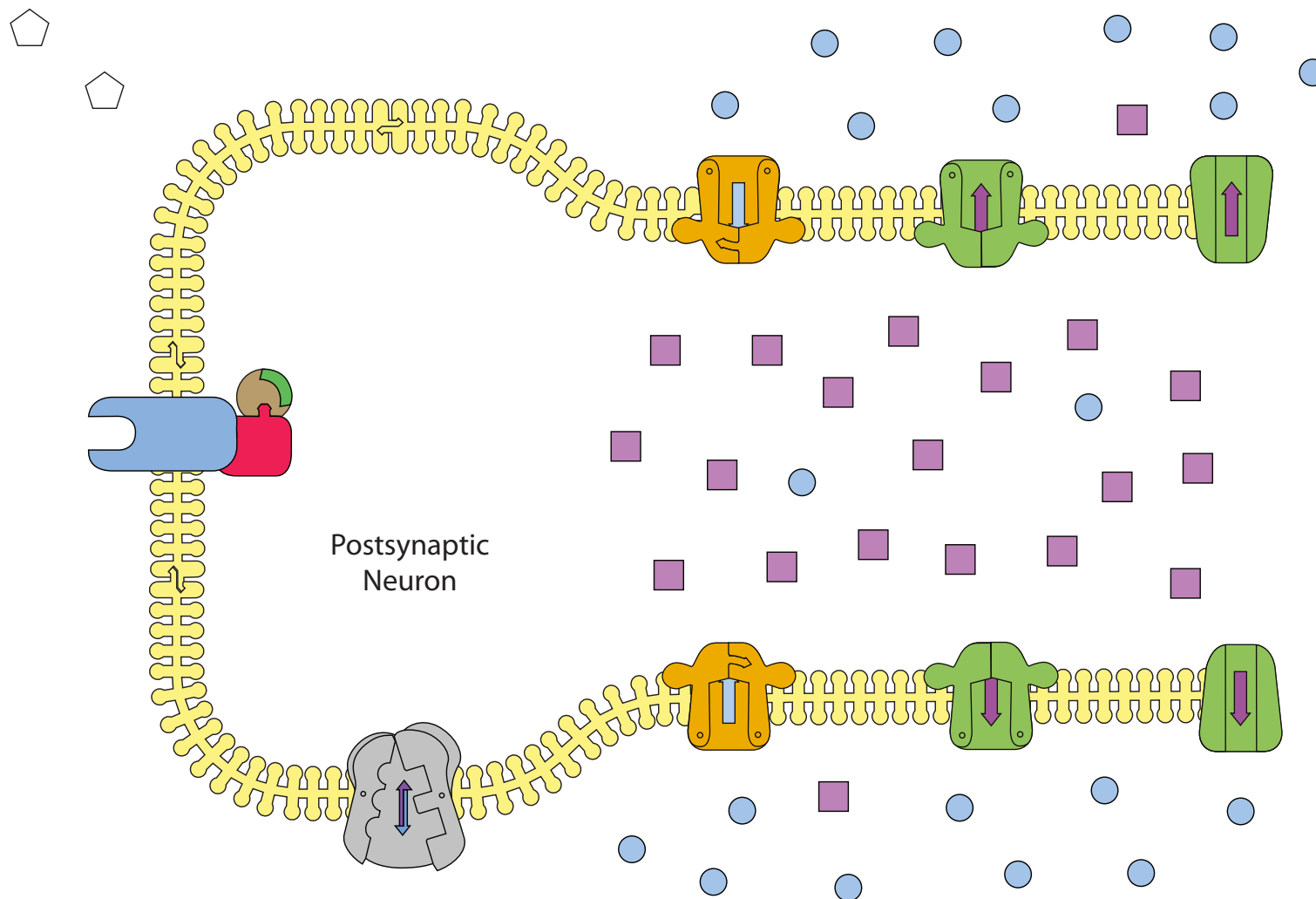


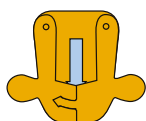
Dopaminergic Synapse Guide



Dopaminergic Synapse Guide

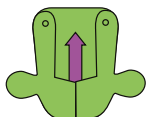


Dopaminergic Synapse Guide



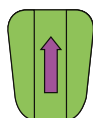
Gated Na⁺ Channel

- A channel protein embedded in neuronal membranes
- Opening triggered by changes in voltage across the membrane
- Specific permeability to sodium ions with a net influx during depolarization



Gated K⁺ Channel

- A channel protein embedded in neuronal membranes
- Opening triggered by changes in voltage across the membrane
- Specific permeability to potassium ions with a net efflux during repolarization



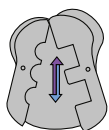
K⁺ Leak Channel

- A transmembrane protein embedded in the membranes of presynaptic and postsynaptic cells
- An open channel allowing potassium ions to follow their concentration gradient
- Important in establishing the resting potential of the neuron



Gated Ca²⁺ Channel

- A channel protein embedded in neuronal membranes
- Triggered by an action potential
- Permeable primarily to Ca²⁺ and some Na⁺



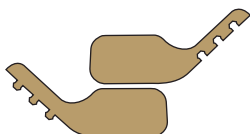
Sodium/Potassium Pump

- An active transport protein located in the neuronal cell membrane
- Establishes the resting potential ion concentrations in neurons



Synaptotagmin

- A protein localized to synaptic vesicular membranes
- Calcium ions bind to induce an interaction with SNAP/SNARE proteins resulting in vesicular membrane fusion



SNAP/SNARE Proteins

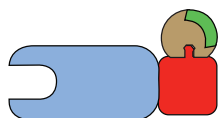
- A complex of proteins located in the vesicular and neuronal membranes
- Enables vesicular fusion with the neuronal membrane



Dopamine

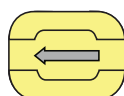
- A neurotransmitter, chemical messenger, stored in synaptic vesicles of the presynaptic cell
- When released into the synaptic cleft, binds to the dopamine receptor in the postsynaptic neuronal membrane

Dopaminergic Synapse Guide



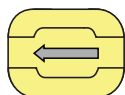
Dopamine Receptor

- A metabotropic G protein-coupled receptor located in the postsynaptic cell membrane
- Bound dopamine triggers a signal cascade reaction based on the G protein coupled to the receptor



Reuptake Transporter Protein

- A protein embedded in the membrane of the presynaptic cell
- Facilitates removal of dopamine from synaptic cleft into the presynaptic cell



Vesicular Transport Protein

- A channel protein embedded in the vesicular membranes of the presynaptic cell
- Facilitates movement of dopamine into the vesicles



Toxins

- Tetrodotoxin from puffer fish blocks the transport of Na^+ through the voltage-gated sodium channels
- Charybdotoxin from scorpions blocks the transport of K^+ through the voltage-gated potassium channels
- Omega-conotoxin from cone snails blocks the transport of Ca^{2+} through the voltage-gated calcium channels



Cocaine

- An addictive chemical compound that acts as a stimulant
- Binds to the dopamine reuptake transporter, increasing the time that dopamine remains in the synaptic cleft