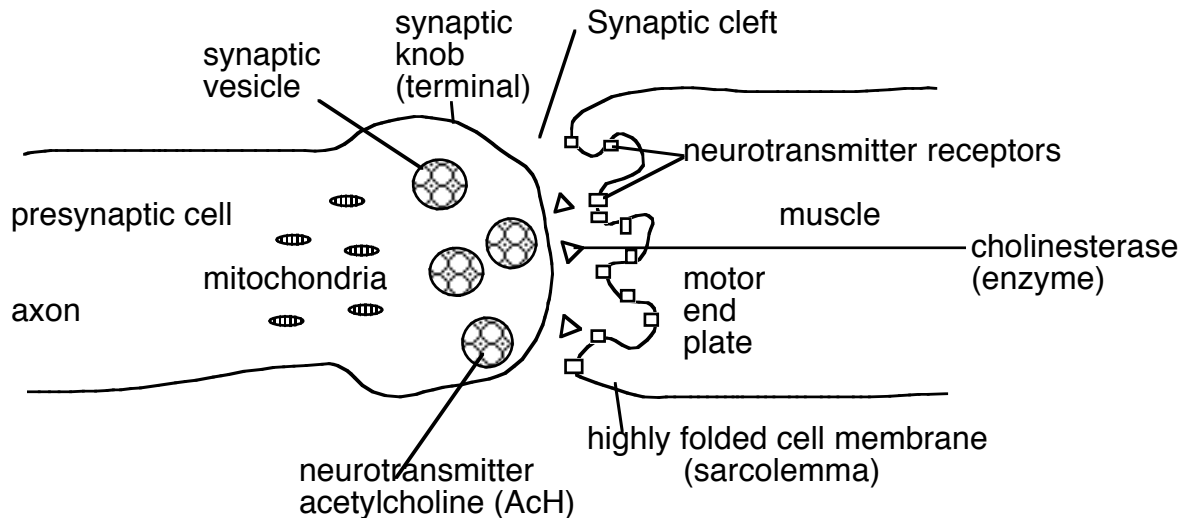


F. Synaptic Transmission

1. synapse = gap between axon of one cell & dendrite of the next.
(the place where communication between excitable cells occurs)
2. Neuromuscular junction = intercellular connection, where communication between NS & skeletal muscle fibers takes place.



3. Transmission

- a. Action Potential (impulse) - depolarizes membrane of synaptic terminal
- b. causes - voltage gated channels to open & Ca^{++} to rush into neuron
- c. causes - synaptic vesicles to fuse with presynaptic membrane
- d. exocytosis releases ACh into synaptic cleft
- e. these molecules diffuse across synaptic cleft & bind to receptors
- f. receptors control ion channels - binding opens channels
- g. causes - Na^+ ions to rush in (selectively, other ions may too)
- h. this depolarizes the post-synaptic membrane
(action potential causes muscles to contract.)
- i. **enzymes** quickly degrade the neurotransmitter ; ion channels close;
calcium ions are pumped out of the pre-synaptic neuron into the cleft

4. Some problems

a. BOTULISM

- toxins produced by Clostridium botulinum (a kind of food poisoning)
- toxin prevents release of ACh
- no communication between nerves, or nerves to muscles
- paralysis of breathing causes death

b. NERVE GAS (Organophosphates)

- destroys cholinesterase
- no new transmissions
- paralysis of breathing causes death
- Ex. "Shell No-Pest Strip" & chihuahua