Date _____

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MSC-3

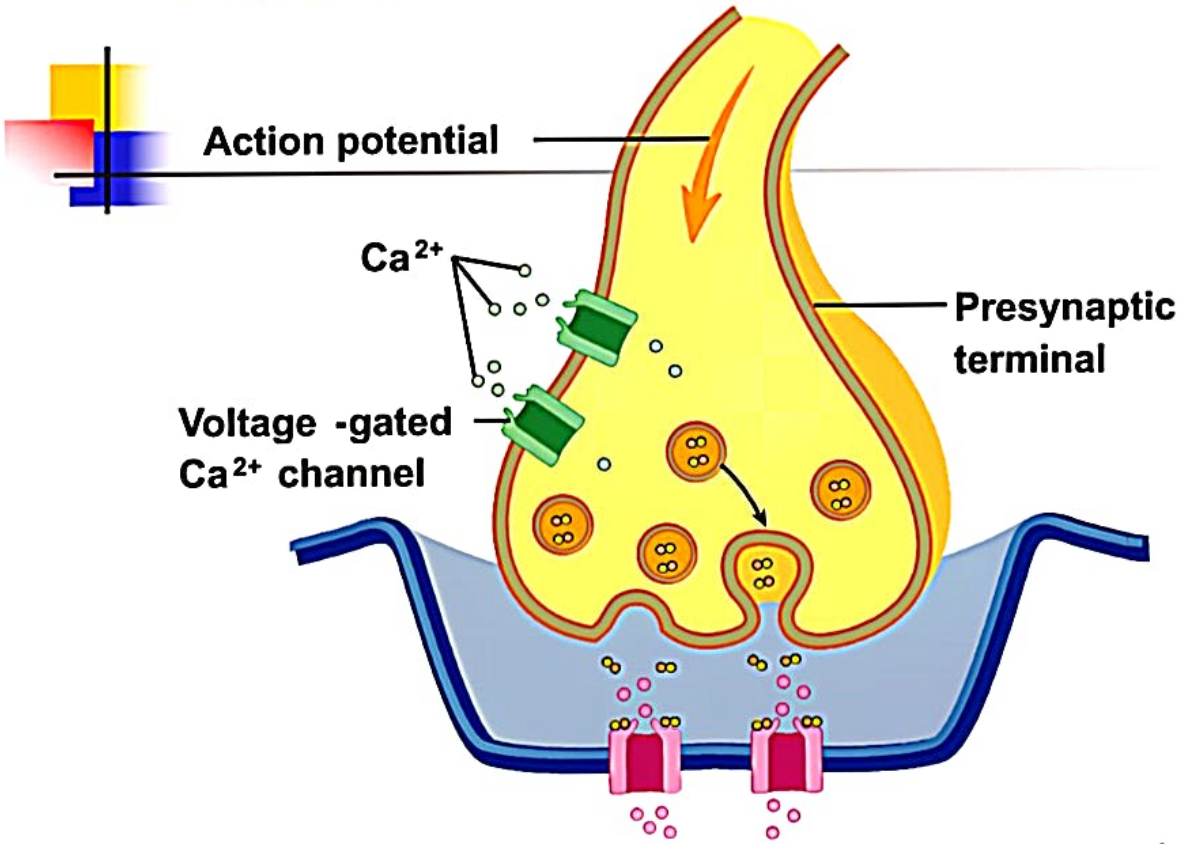
Topic- End plate potential (EPP)

- Small packets of Acetylcholine are released randomly from nerve cell at rest. Each producing smallest possible changes in membrane potential of motor end plate.
- When nerve impulse reaches the ending, the number of Quanta is packet release increase by several folds and result in larg EPP.
- EPP then spread by local current to adjacent muscle fibers which are depolarise to threshold and fire action potential.
- Muscle cell electrical response is turned off by acetylcholinesterase which degrade Ach to choline and acetate
- About 50% of Choline is returned to the presynaptic terminals by Na+-Choline transport to be reused for Acetylcholine Synthesis.

Teacher's Signature : _____

- New muscle fibers can relax if sustained contraction is needed for the desired movement another motor neuron AP leads to release of more Ach
- Some of the diseases involving N.M. junction is characterized by the extreme muscular weakness. called Myasthenia gravis
- It is an auto immune condition in which the body erroneously produces antibodies against its own motor end plate Ach receptors.
- Thus not all Ach molecules can bind functioning receptors site with which to bind.
- As a result AchE destroys much of Ach before it leaves has a chance to intercact with receptor site and contribute to EPP.
- It is treated with long acting anticholinesterase inhibitor.

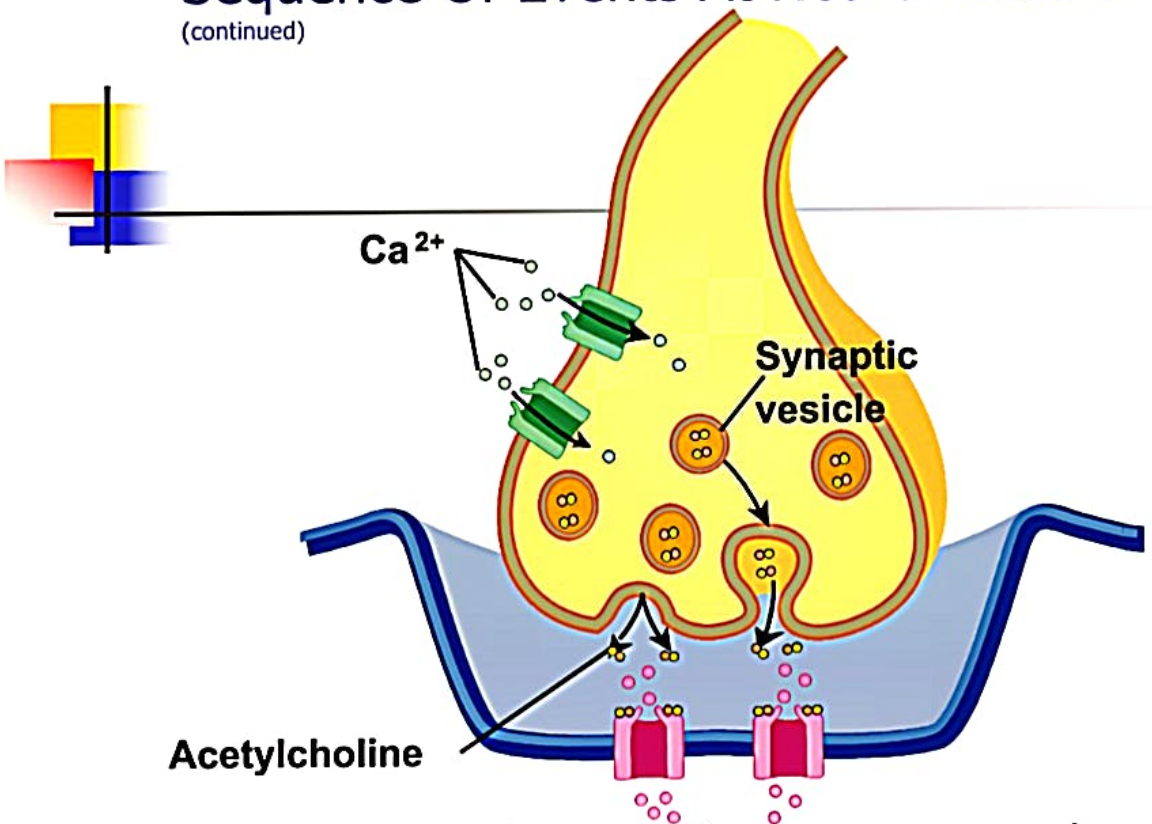
Sequence Of Events At Neuromuscular Junction



Action potentials arriving at the presynaptic terminal cause voltage-gated Ca^{2+} channels to open.

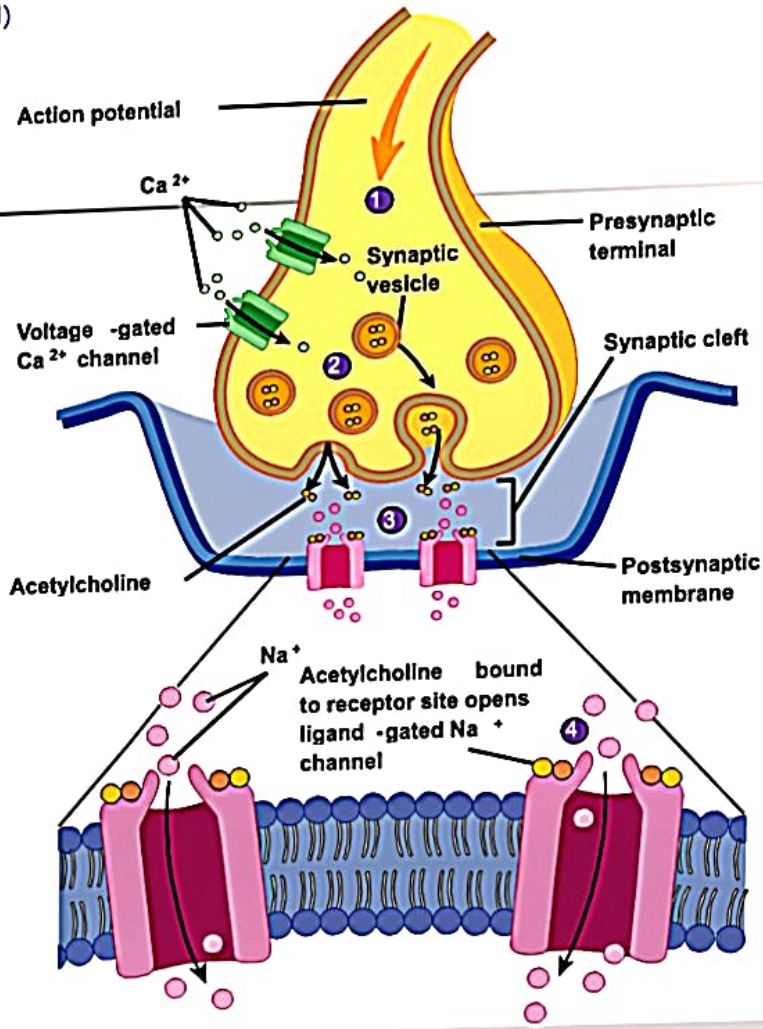
Sequence Of Events At Neuromuscular Junction

(continued)

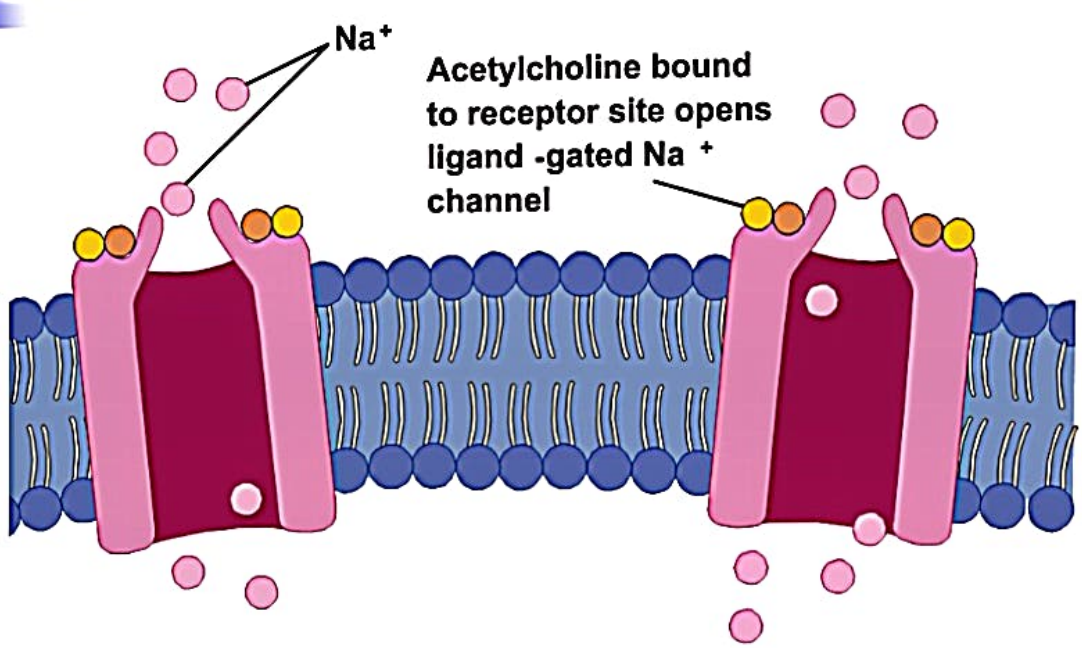


Ca2+ uptake into the terminal causes release of the neurotransmitter acetylcholine into synaptic cleft , which has been synthesized and stored into synaptic vesicles

Sequence Of Events At Neuromuscular Junction
(continued)



Sequence Of Events At Neuromuscular Junction (continued)



Acetylcholine molecules combine with their receptor sites and cause ligand -gated Na + channels to open.