

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

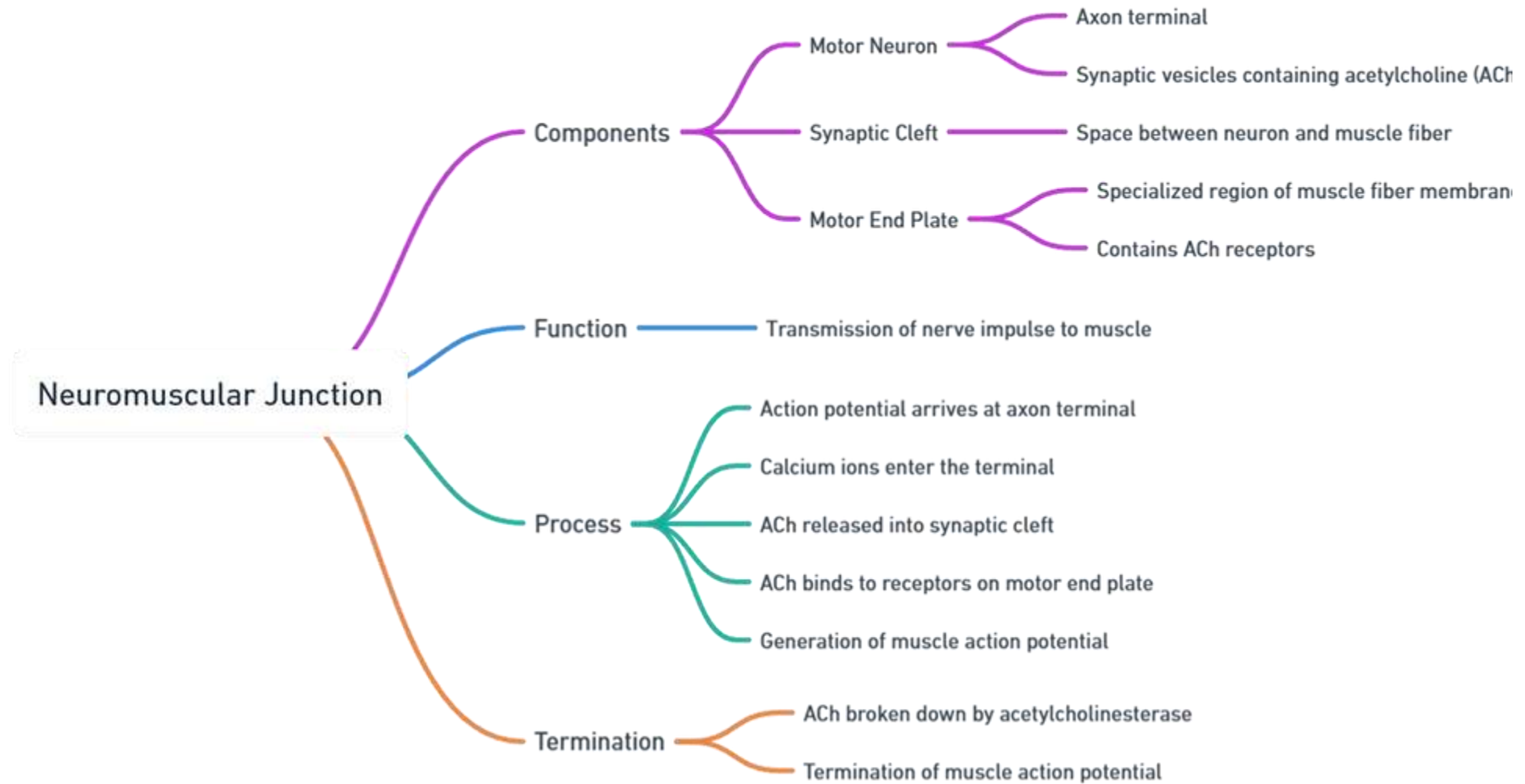
Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi. Coimbatore -641035

COURSE NAME : HUMAN ANATOMY & PHYSIOLOGY (BP301 T)

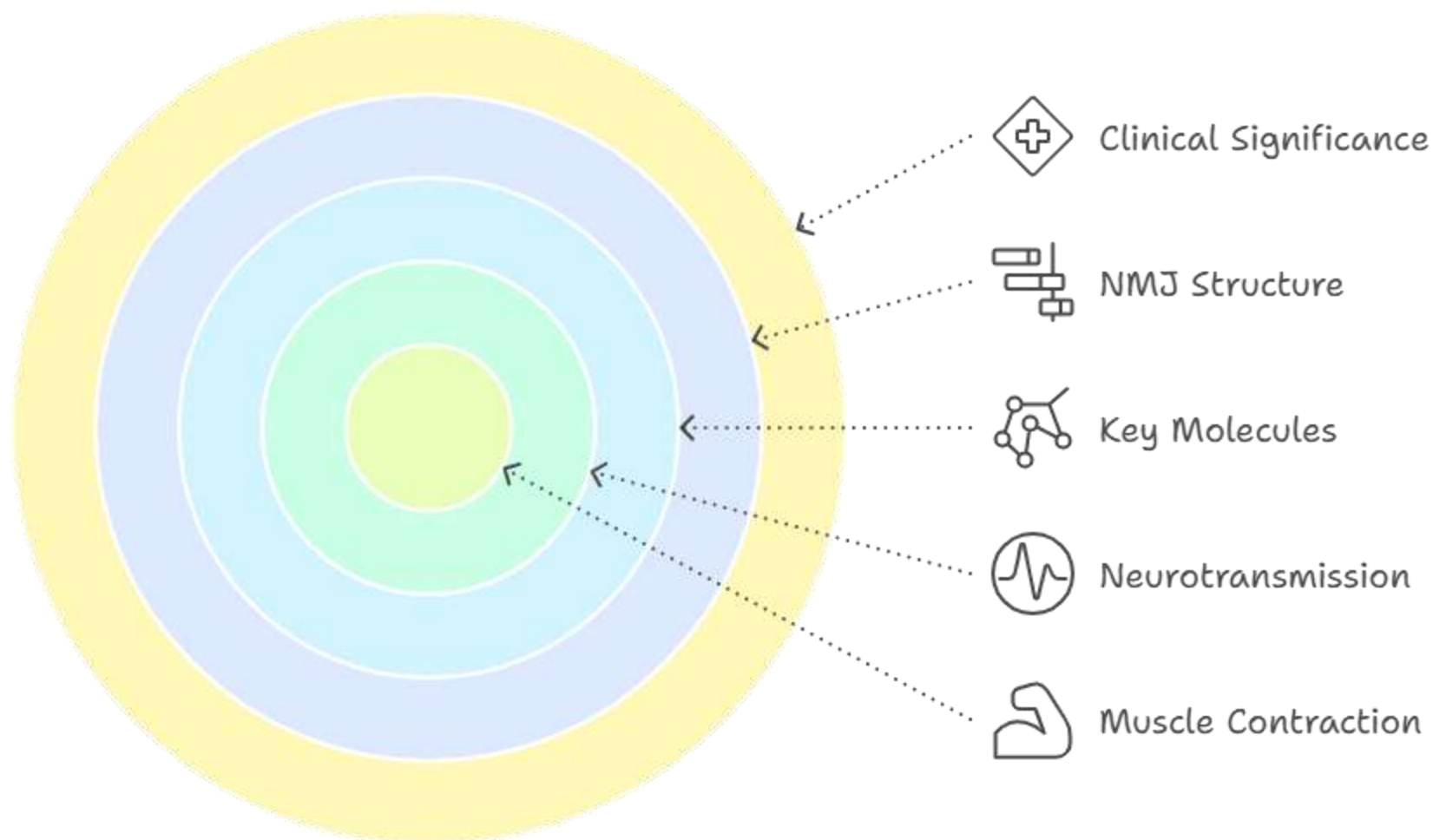
YEAR : I SEM/I YEAR

TOPIC : NEUROMUSCULAR JUNCTION

MIND MAP



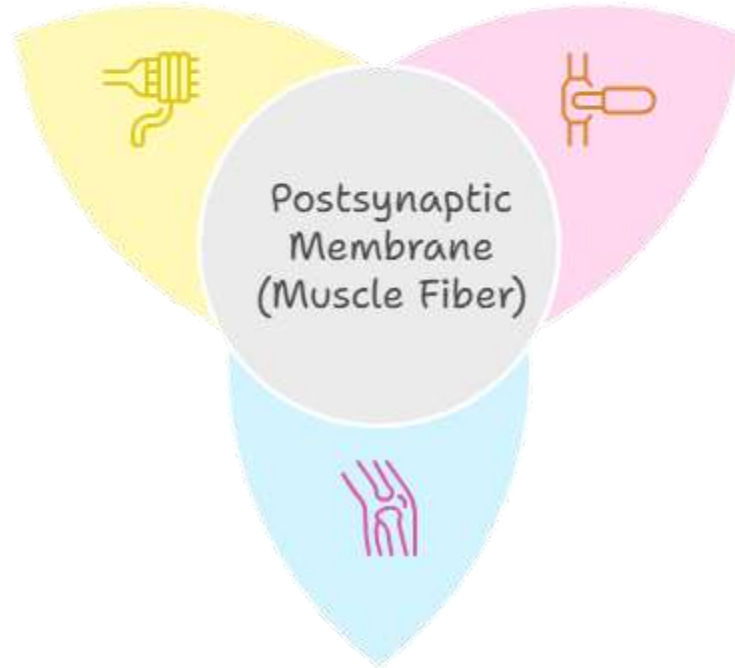
Neuromuscular Junction Overview



Essential Components for Neuromuscular Transmission

Presynaptic Terminal (Motor Neuron)

Releases neurotransmitter



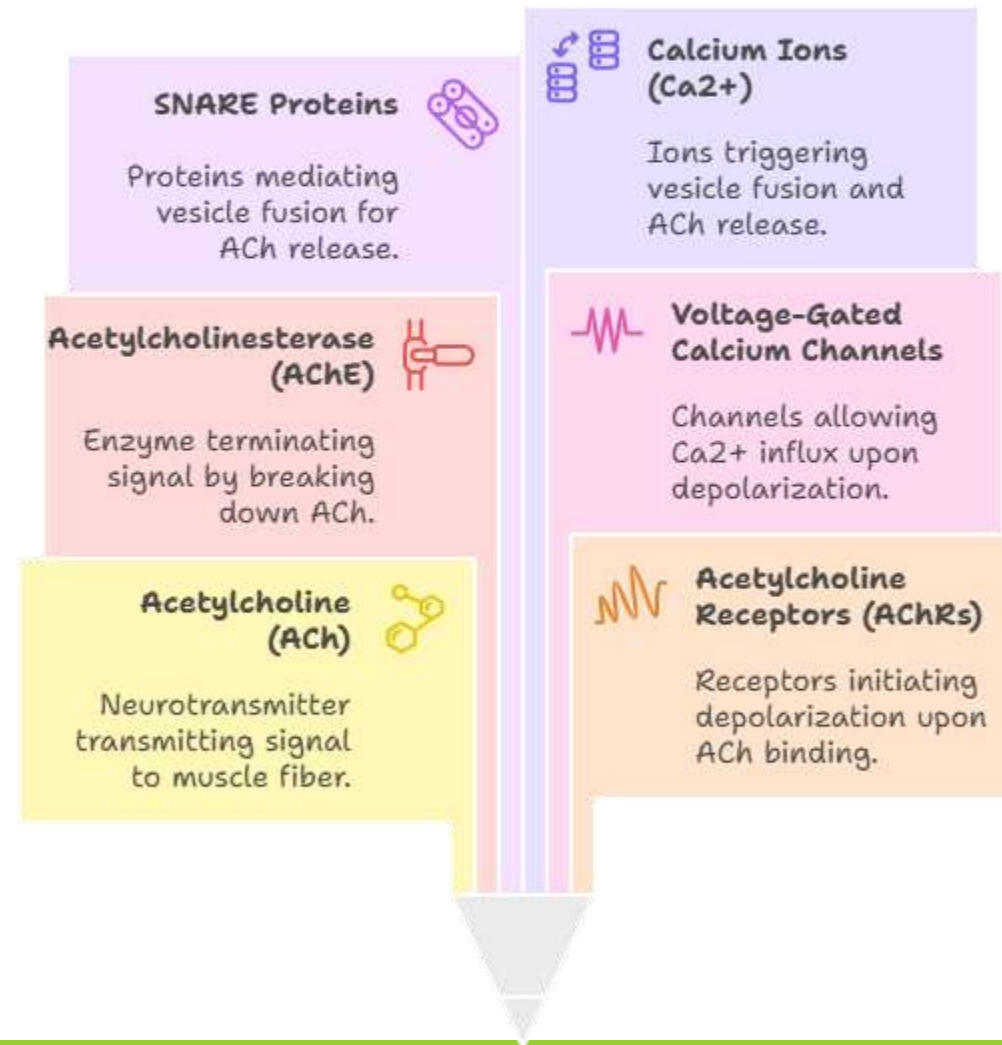
Neurotransmitter Release

ACh release into the synaptic cleft

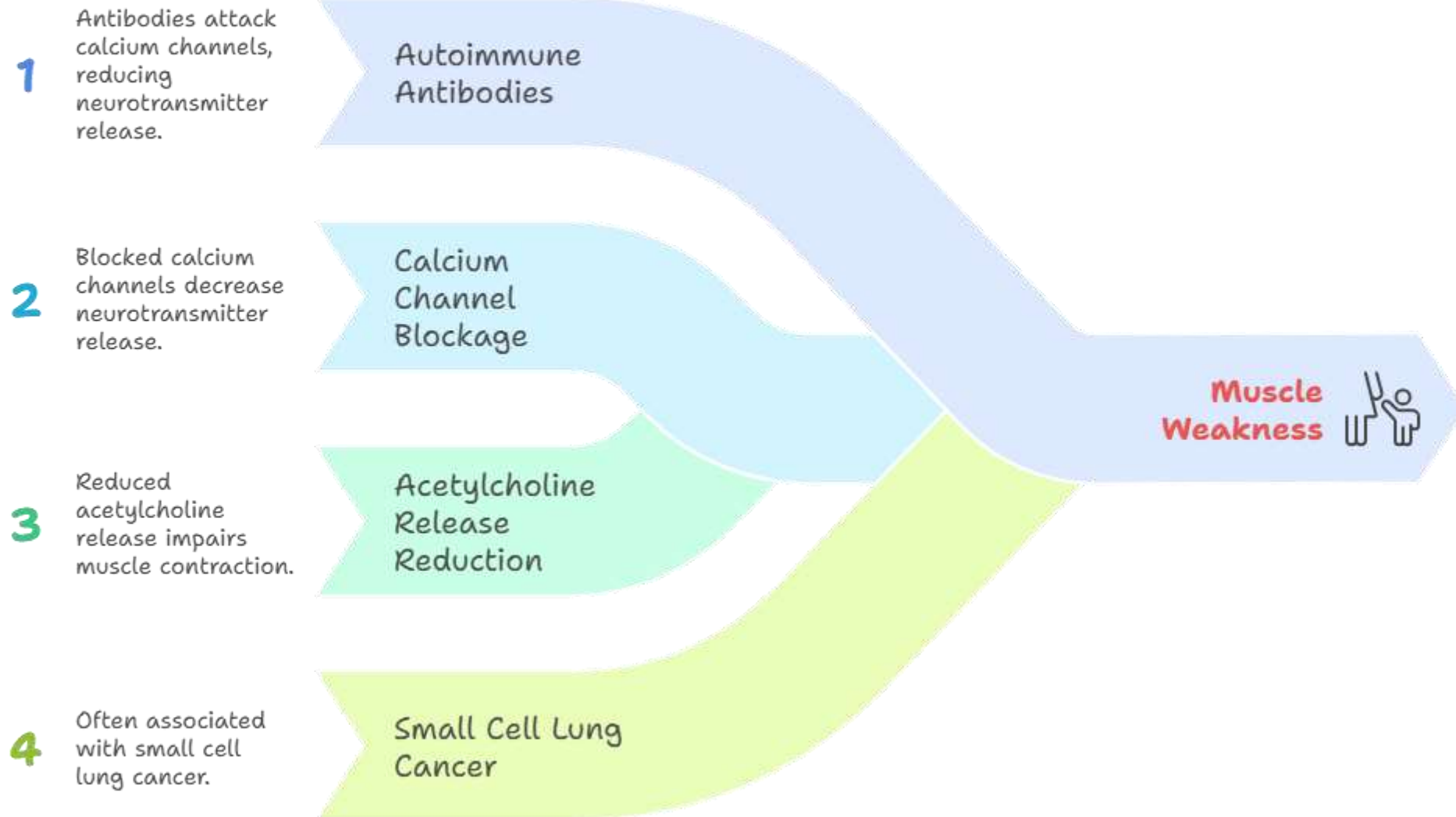
Synaptic Cleft

Space for neurotransmitter diffusion

Orchestrating Neuromuscular Communication



Pathways to Muscle Weakness



Organophosphate Poisoning Mechanism

AChR Overstimulation

Excessive activation of acetylcholine receptors

Organophosphates

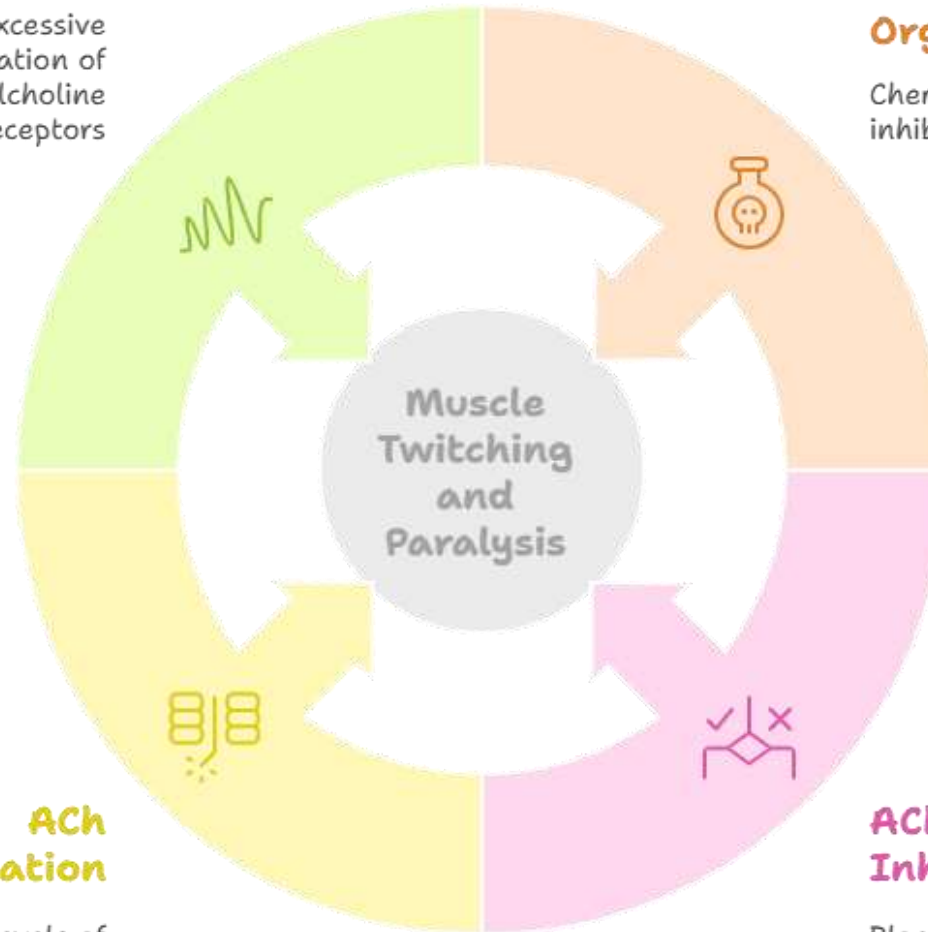
Chemicals that inhibit AChE

ACh Accumulation

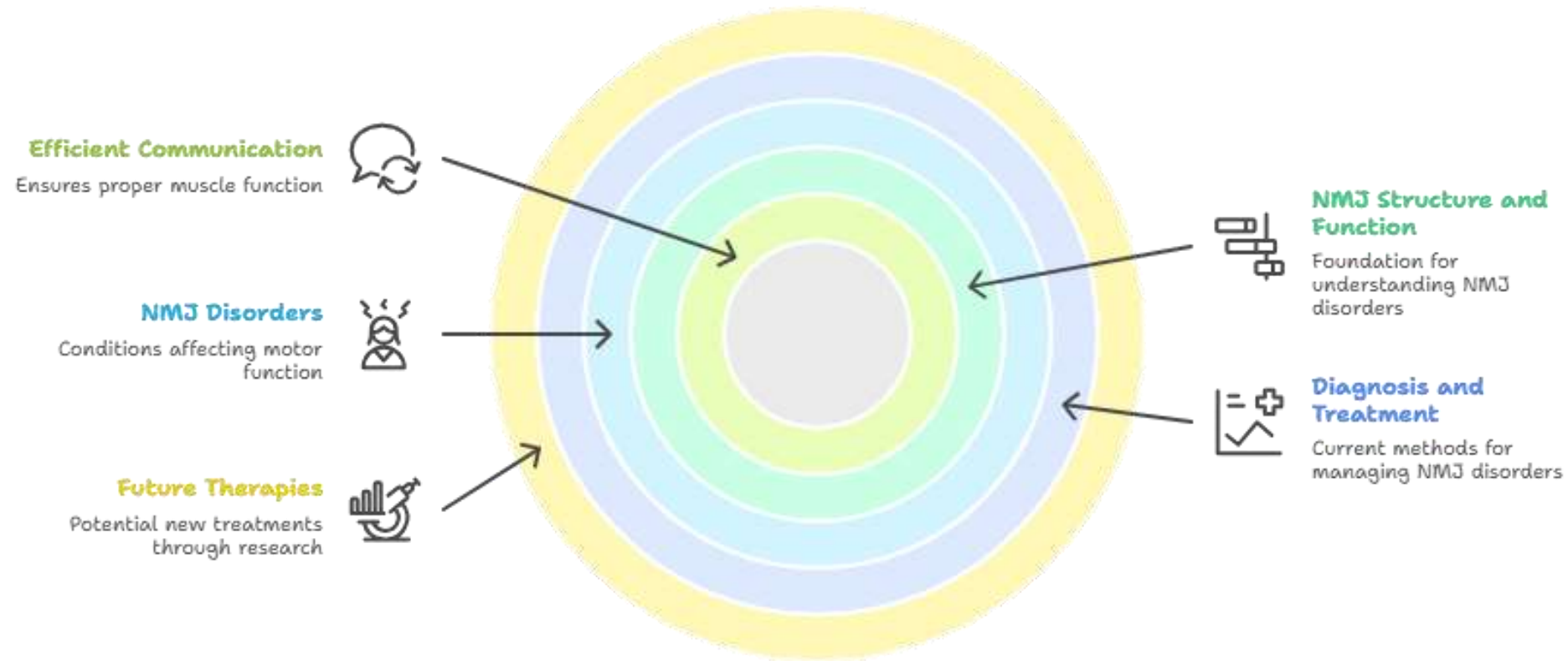
Increased levels of acetylcholine in the synapse

AChE Inhibition

Blocking the enzyme that breaks down ACh



Neuromuscular Junction Importance



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Nerve Conduction Studies (NCS)

What are Nerve Conduction Studies (NCS)?

They measure the speed and amplitude of electrical signals traveling along nerves.

What do they show in NMJ disorders?

NCS may show a decrease in the amplitude of the compound muscle action potential (CMAP) with repetitive nerve stimulation.



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Which diagnostic test is most suitable for evaluating muscle activity in NMJ disorders?



**Electromyography
(EMG)**

Measures muscle electrical activity

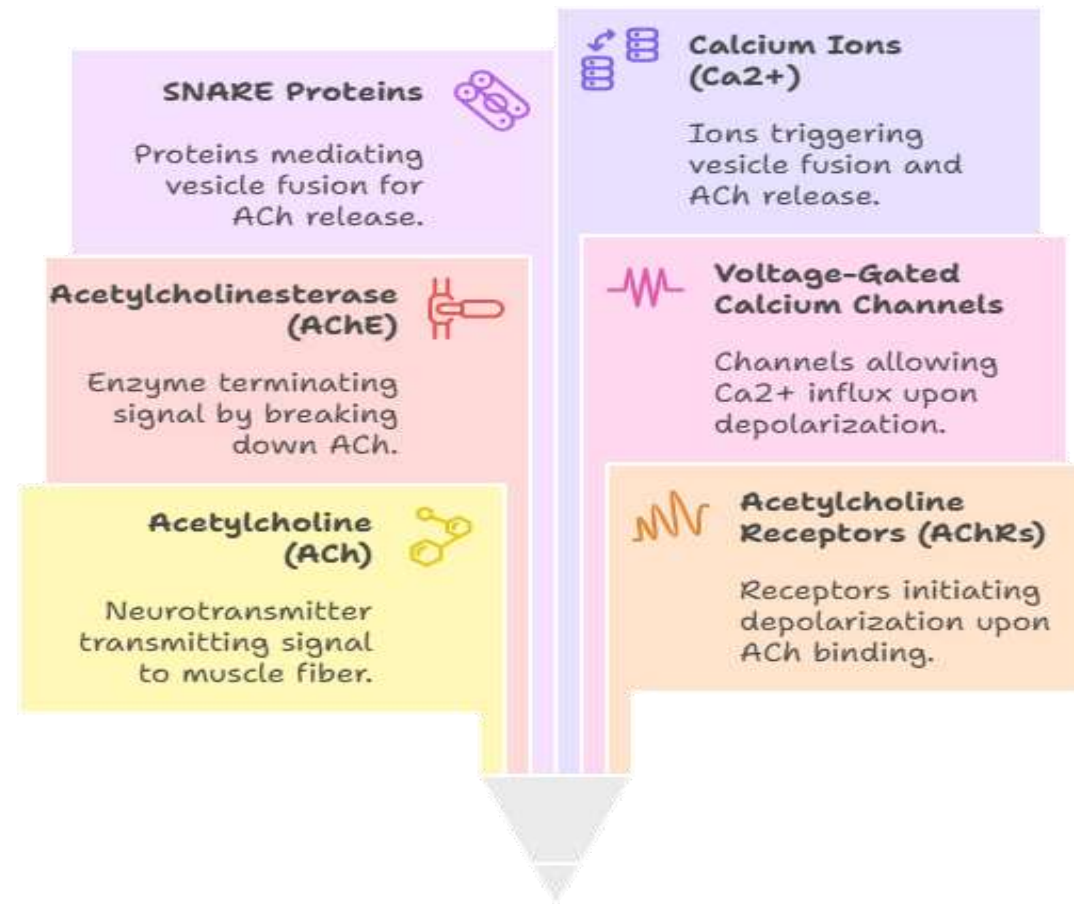


**Nerve Conduction
Studies (NCS)**

Measures nerve signal speed and amplitude

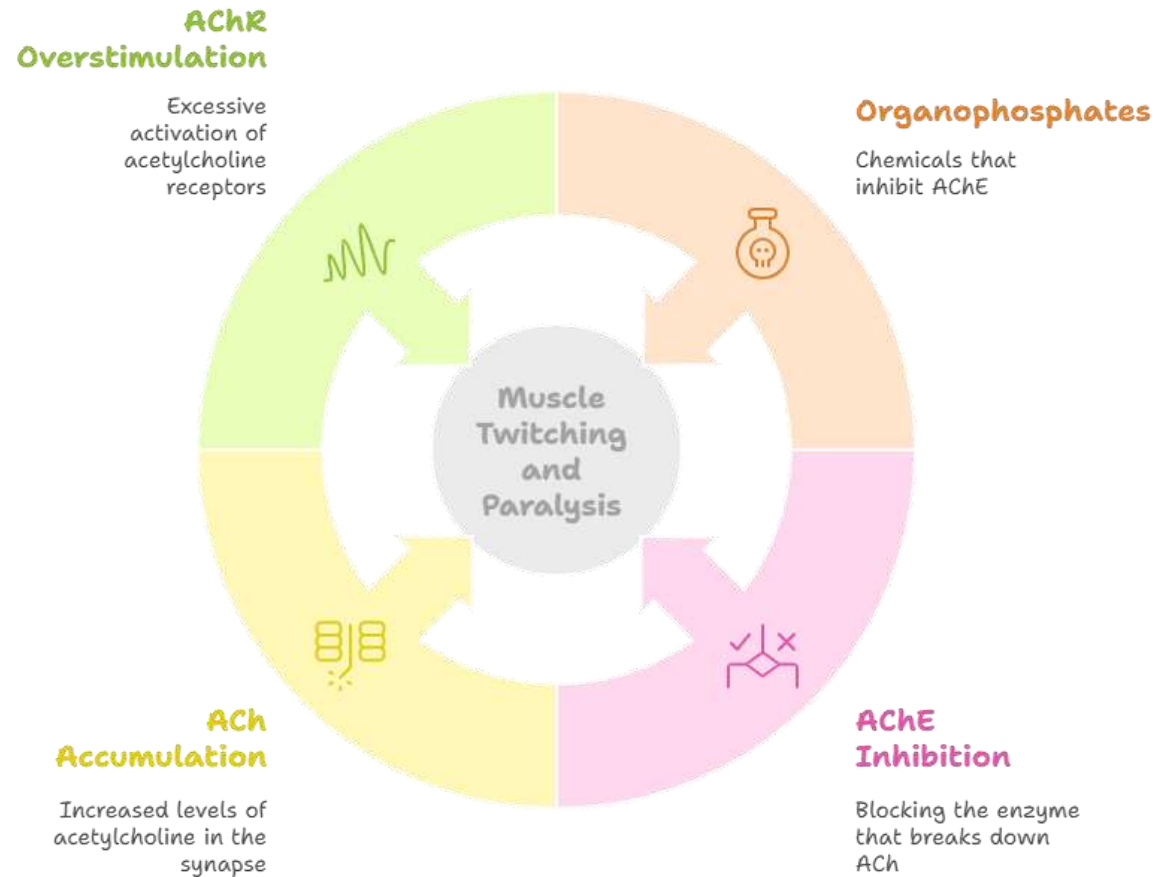
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Orchestrating Neuromuscular Communication



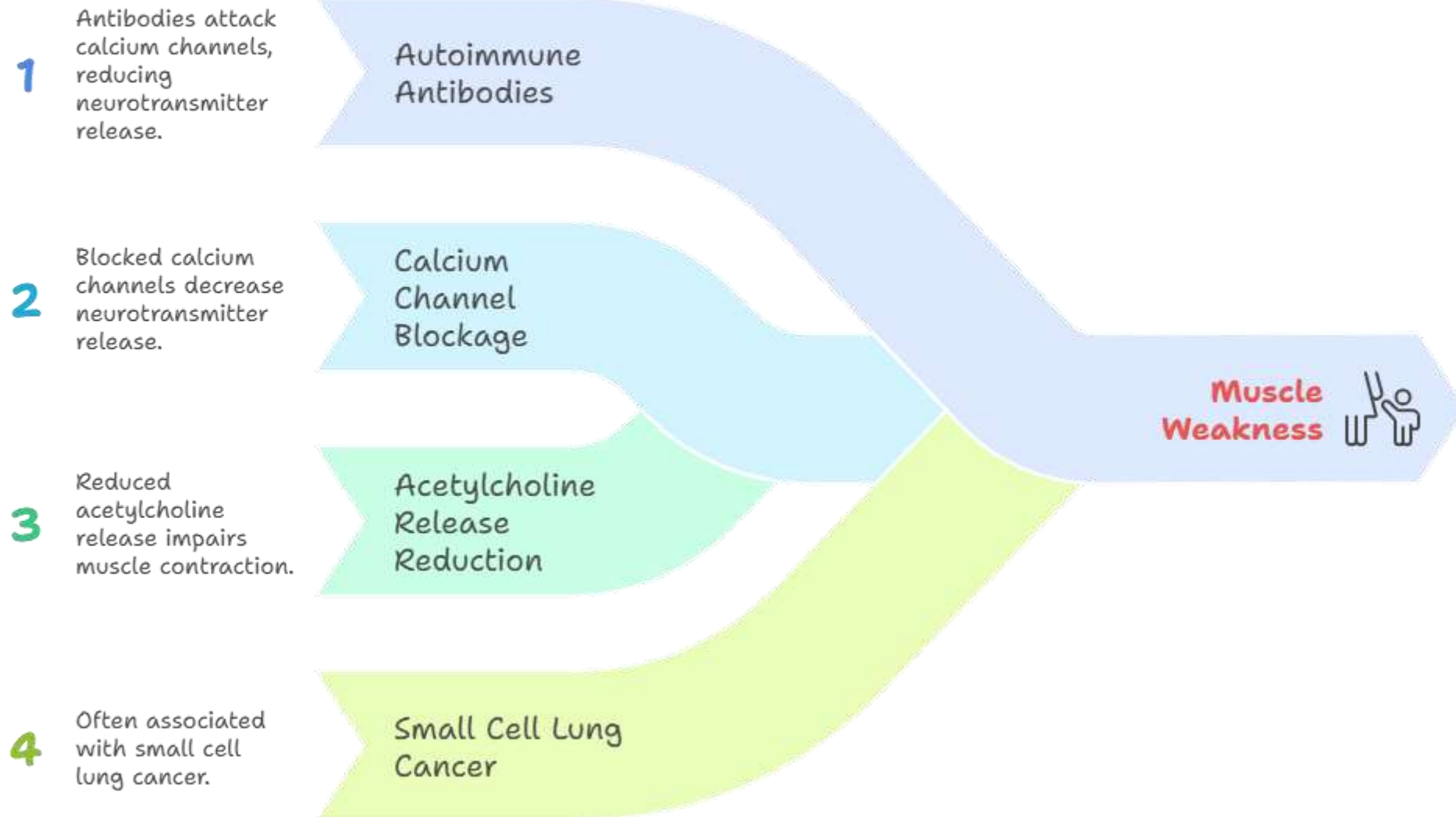
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Organophosphate Poisoning Mechanism

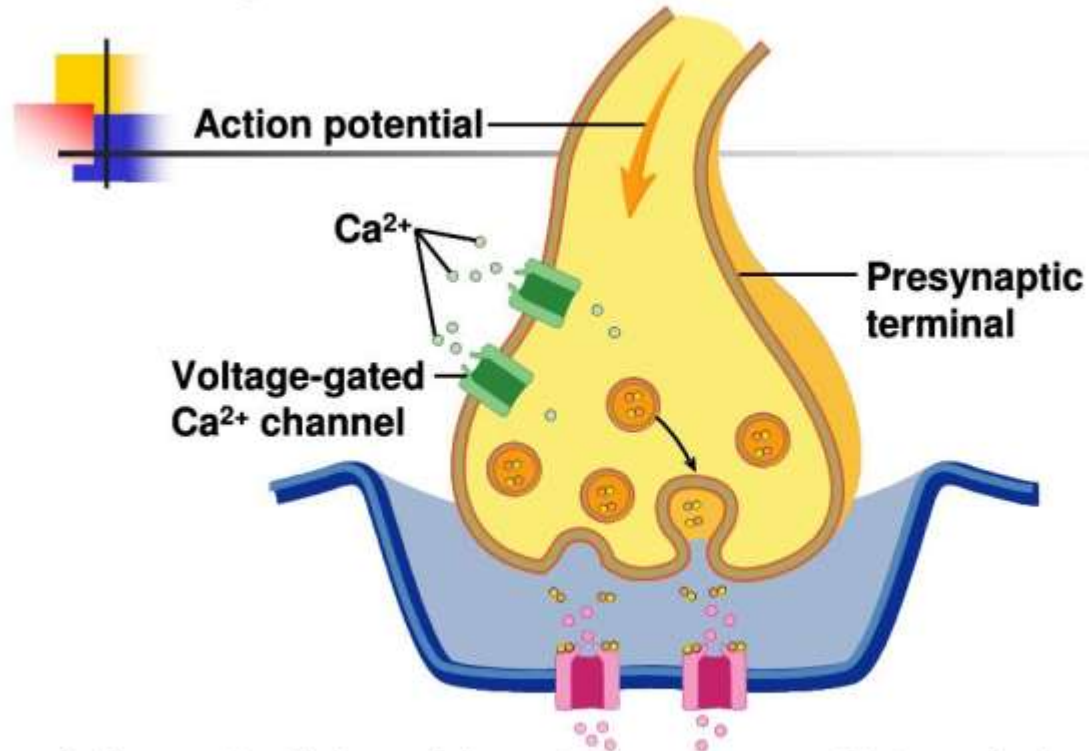


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Pathways to Muscle Weakness



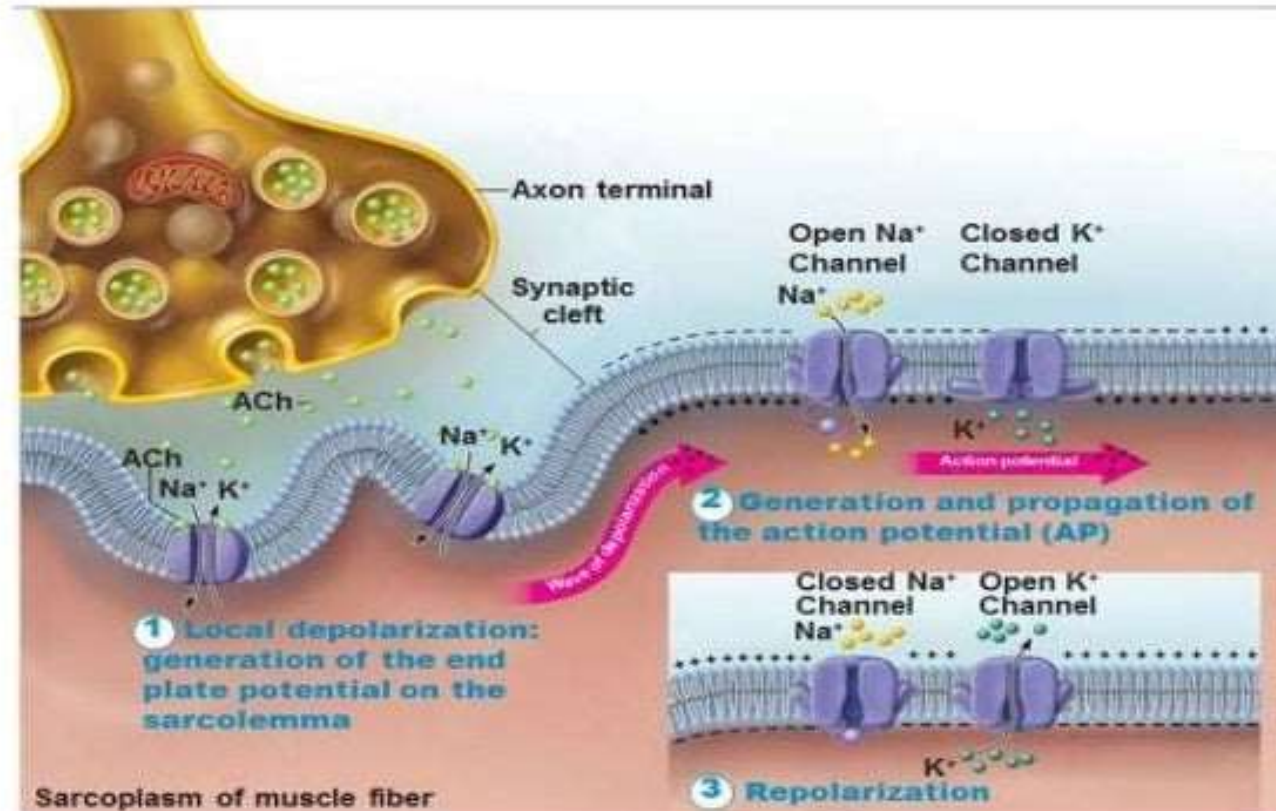
Sequence Of Events At Neuromuscular Junction



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

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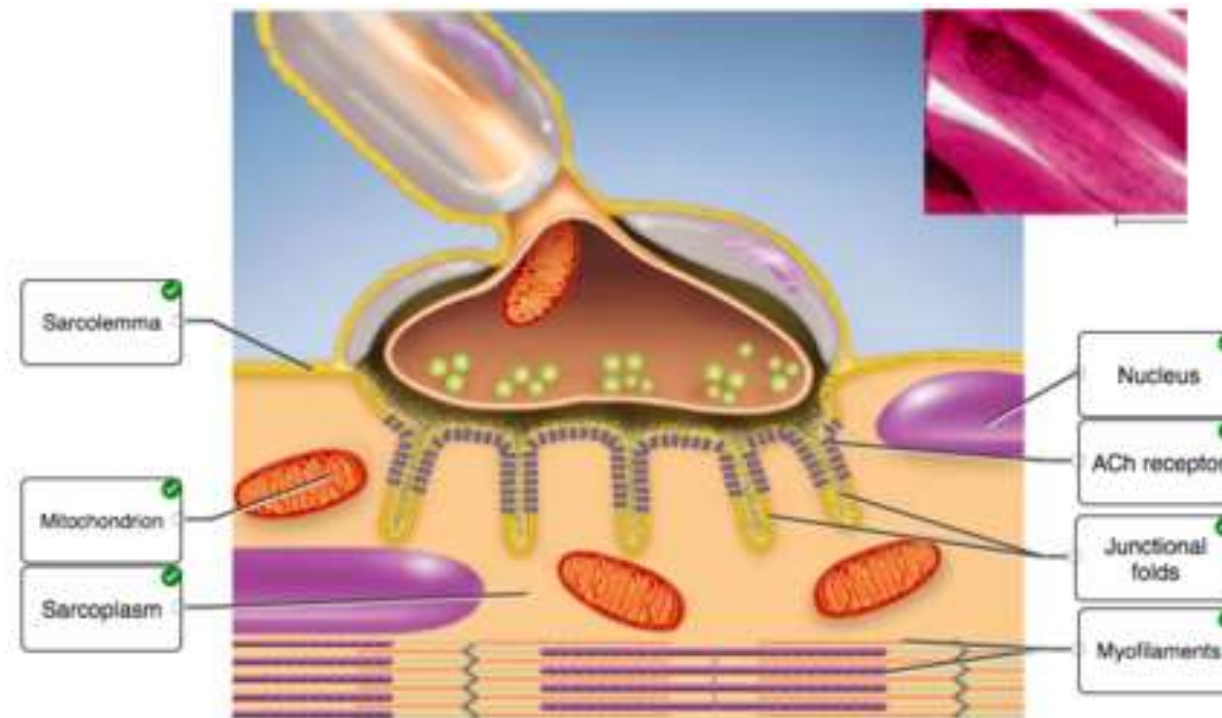
Development of end plate potential





CLASS ASSESSMENTS

Write the physiology using this diagram?

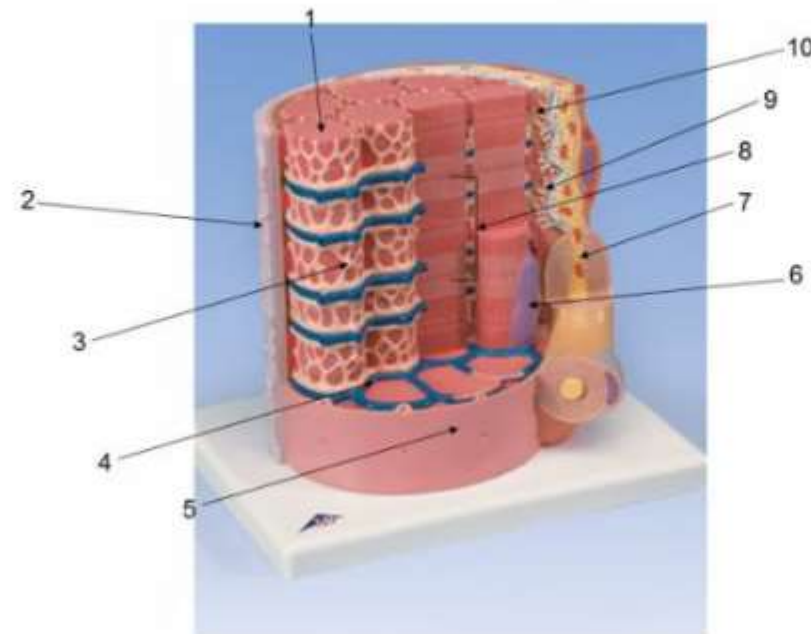


CLASS ASSESSMENTS



Label the parts in neuromuscular junction?

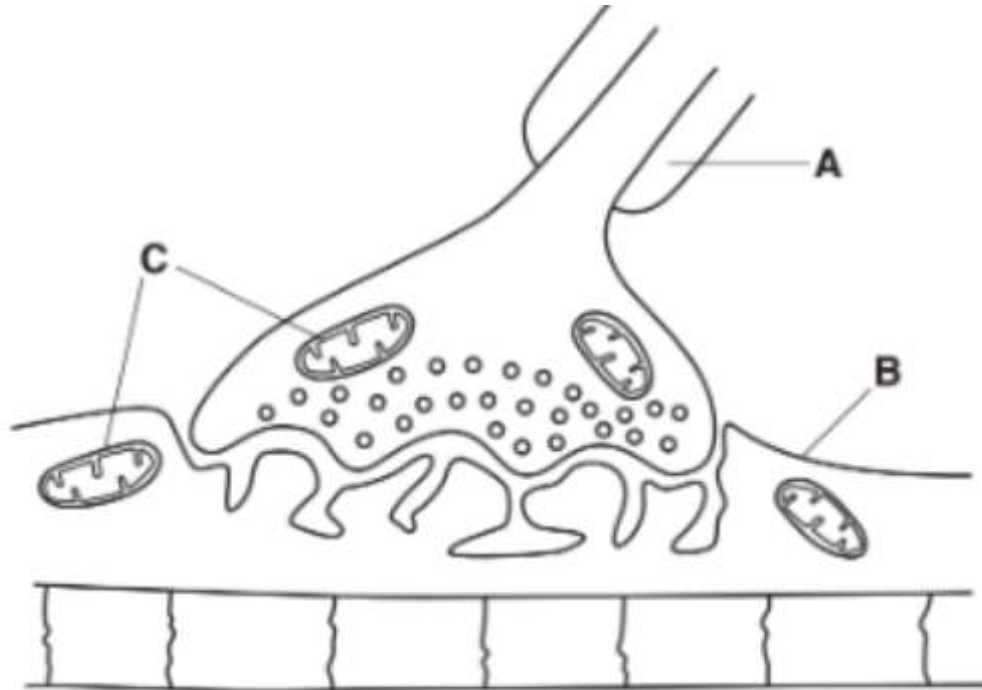
Neuromuscular junction



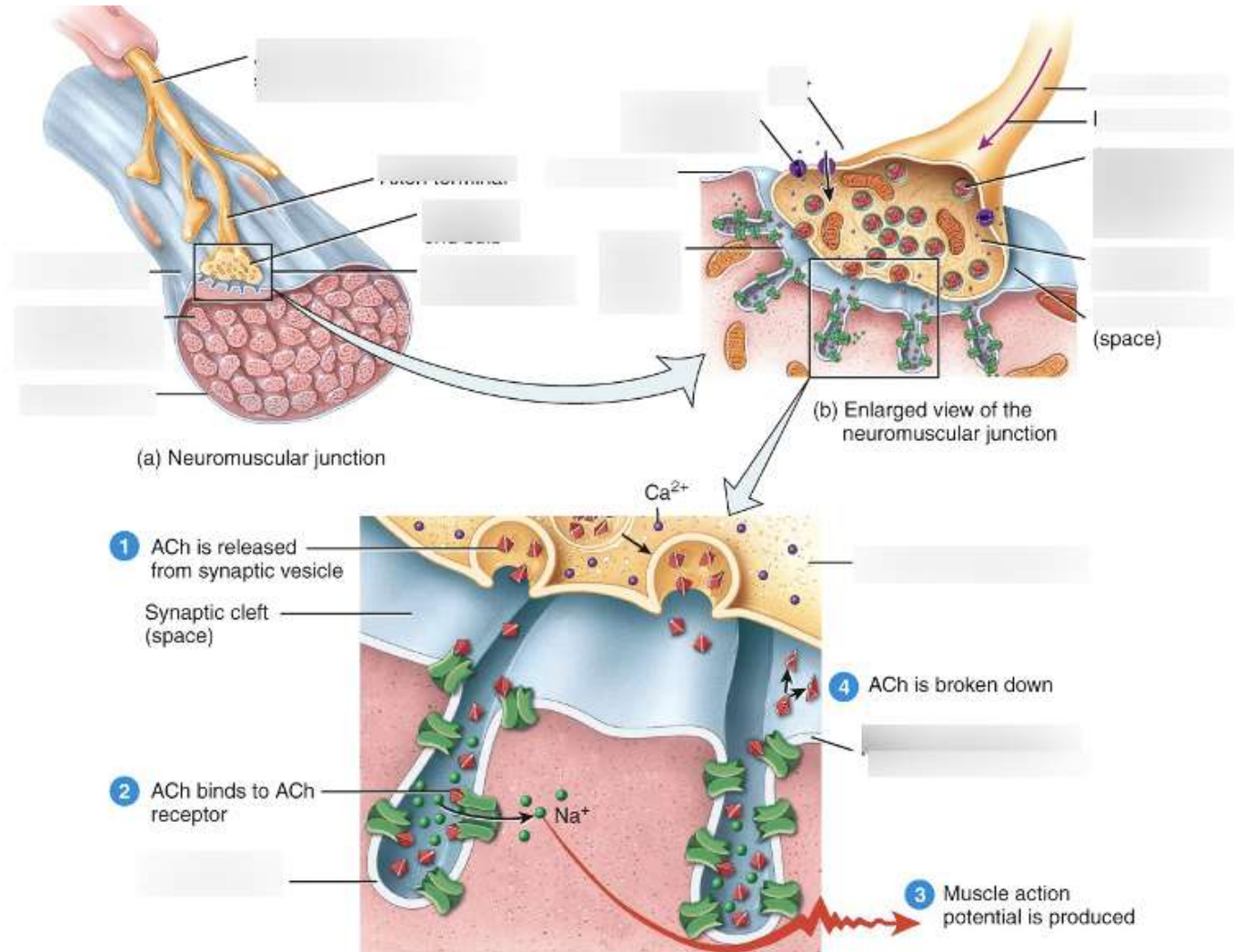
CLASS ASSESSMENTS



Label the parts in neuromuscular junction?



SUMMARY



REFERENCE

- ✓ Essentials of Medical Physiology, K. Sembulingam & P. Sembulingam (Jaypee Brothers Medical Publishers)
- ✓ A Textbook of Human Anatomy and Physiology-I, SIA Publishers
- ✓ Human Anatomy & Physiology Gerard J. Tortora & Bryan H. Derrickson (Wiley)
- ✓ Ross and Wilson anatomy and physiology in health and illness, Anne Waugh & Allison Grant.

