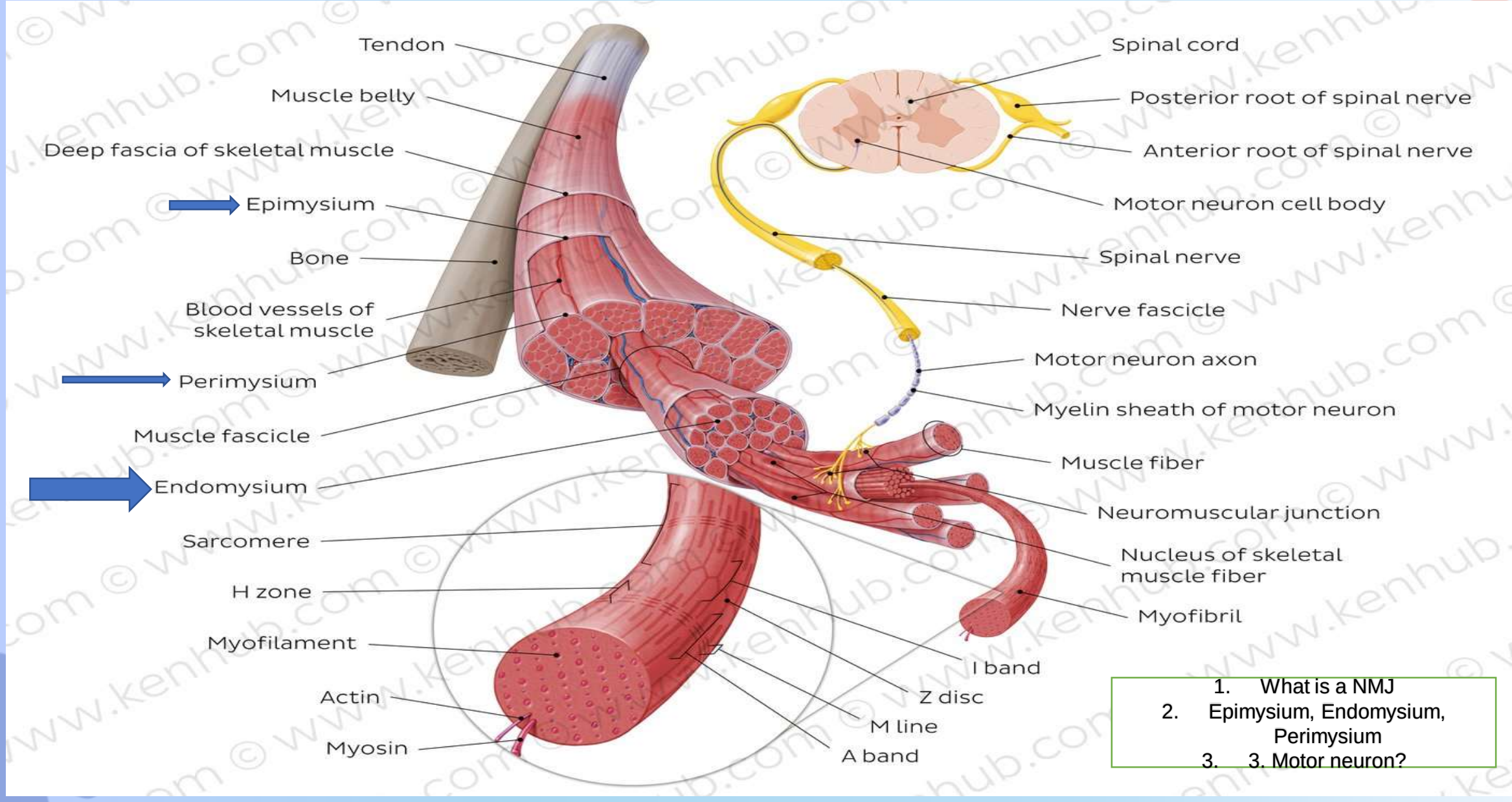
NEURO-MUSCULAR JUNCTION

By Vasvi Sadhwani

Overview

1) Structure and Function of the Neuromuscular Junction
2) Events in Neuromuscular Junction Transmiss
3) Action of Acetylcholinesterase (AchE)
4) Neuromuscular Junction Dysfunctions
    1) Curare
    2) Bungarotoxin
    3) Succinylcholine
    4) Botulinum Toxin
    5) AchE Inactivators
6) Disorders of the Neuromuscular Junction
    1) Myasthenia Gravis
7) Questions !

What even is the Neuromuscular Junction?



1. What is a NMJ
2. Epimysium, Endomysium, Perimysium
3. 3. Motor neuron?

MOTOR UNIT

Include all the muscle fibers innervated by a single motor neuron

INNERVATION RATIO (Delicate vs Coarse movements)

Lower the ratio – Finer the control of movements

4. Motor unit?
5. Innervation ratio?
6. IR is high/low for writing
7. High or low for walking

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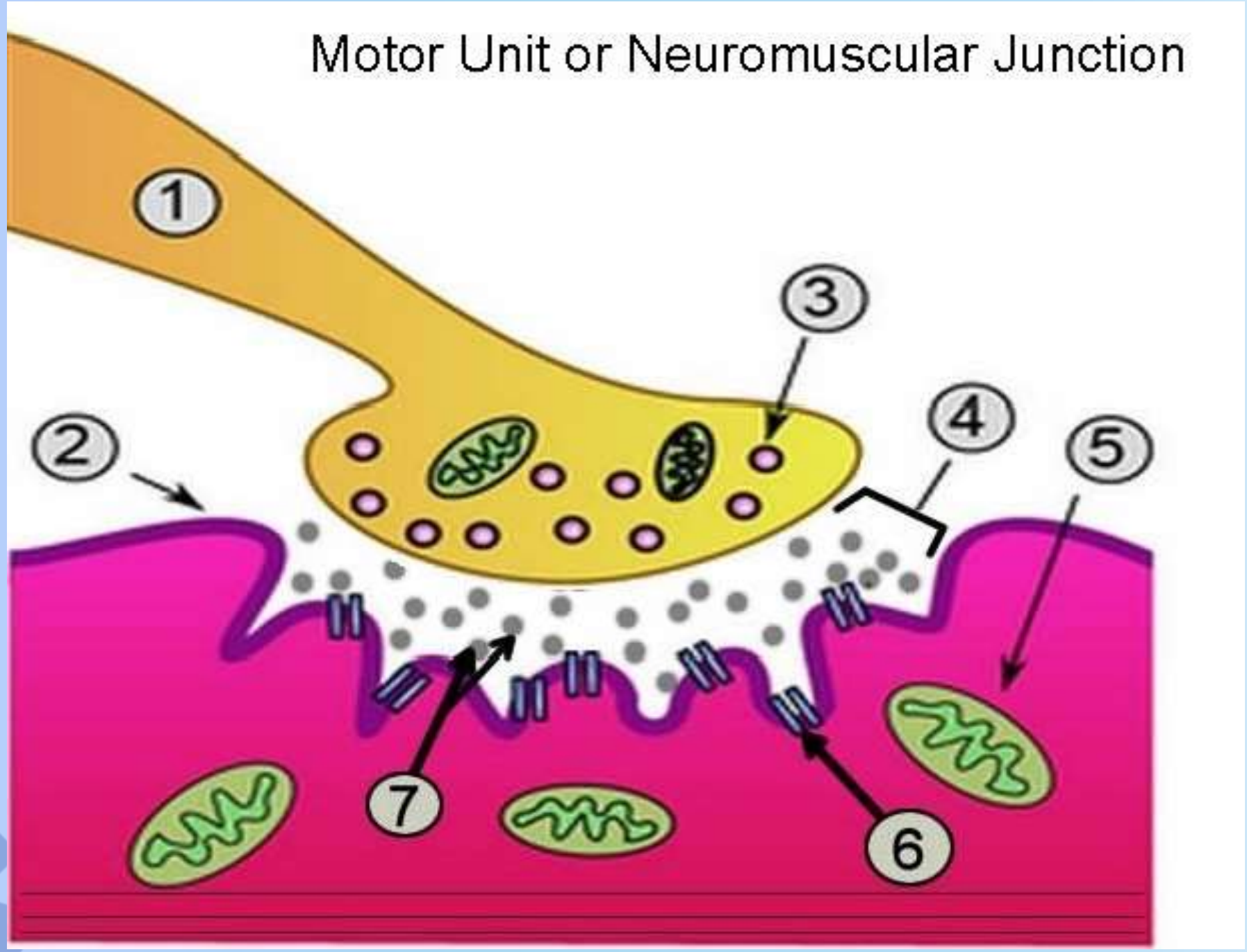
Motor Unit or Neuromuscular Junction



8. Name 1- 7

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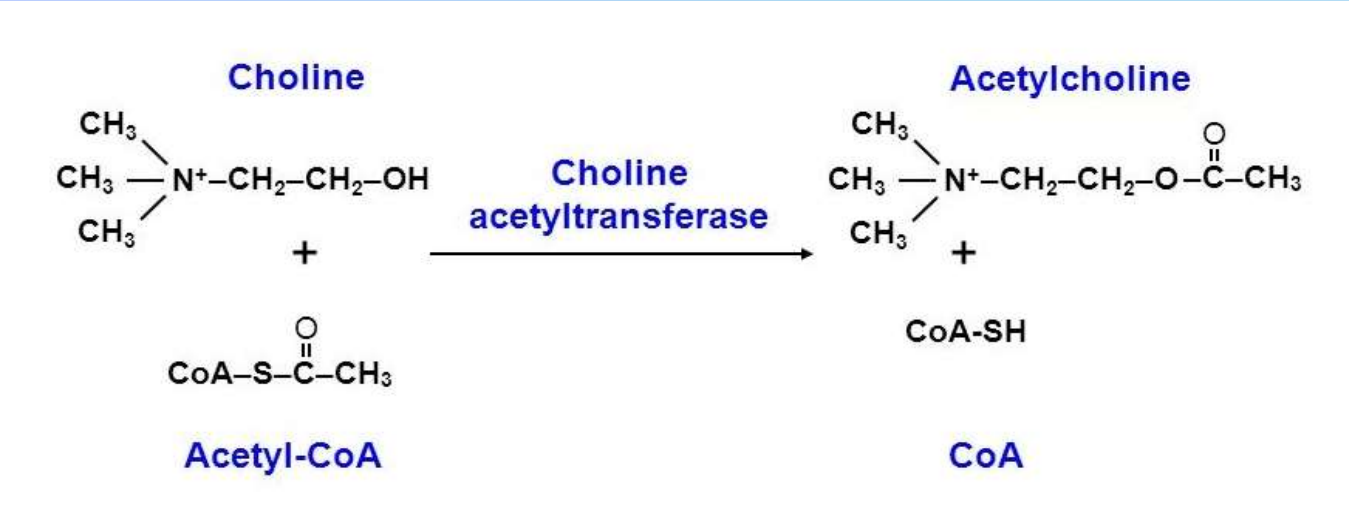
What is Acetylcholine?

1) Neurotransmitter aiding in contraction of muscle
2) Present in cholinergic (Acetylcholine producing) neurons
3) Components of AcH



9. Other functions of ACH
10. Where is choline derived from
11. Where is acetylcoA coming from
12. What facilitates this reaction?

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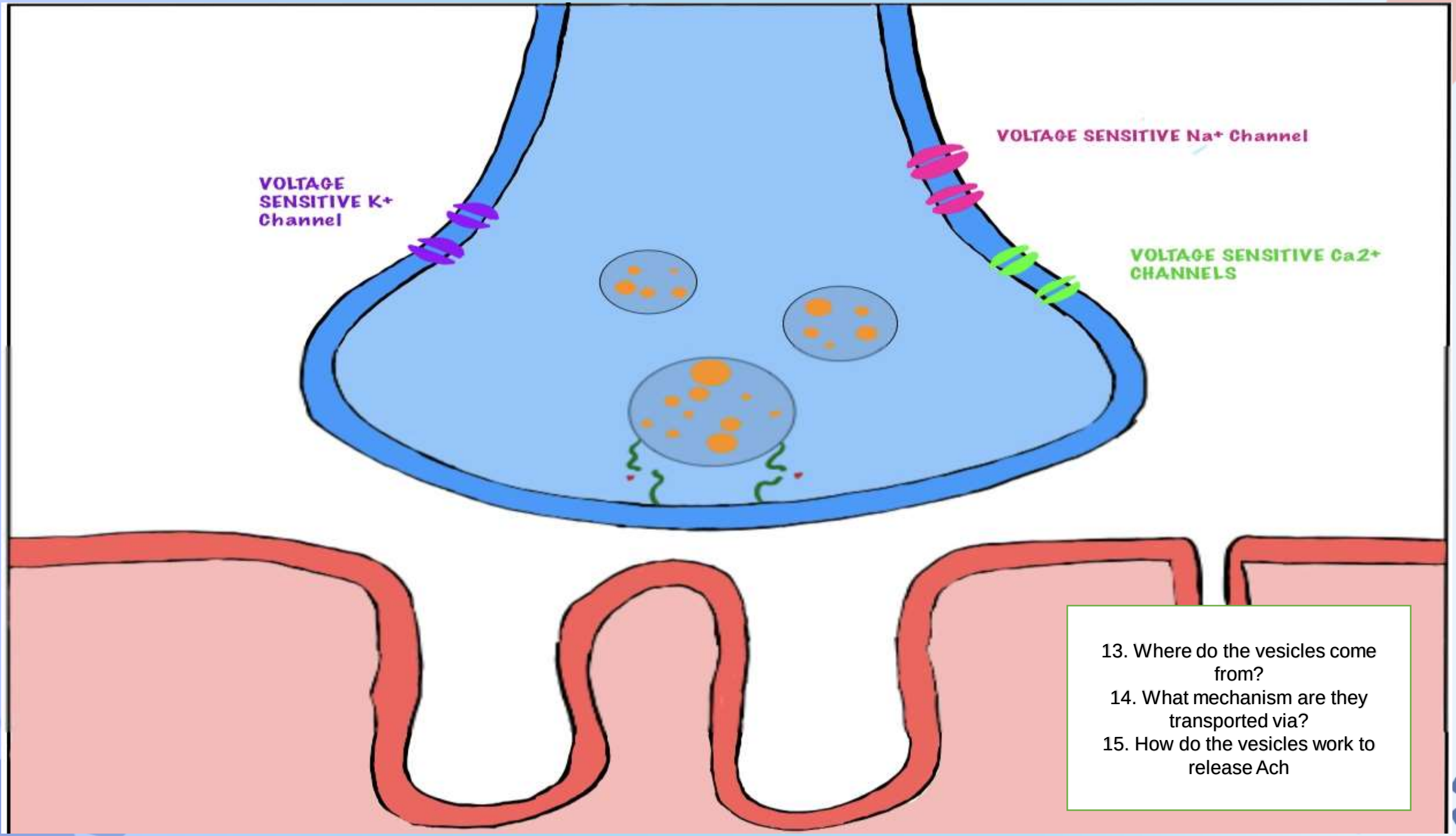
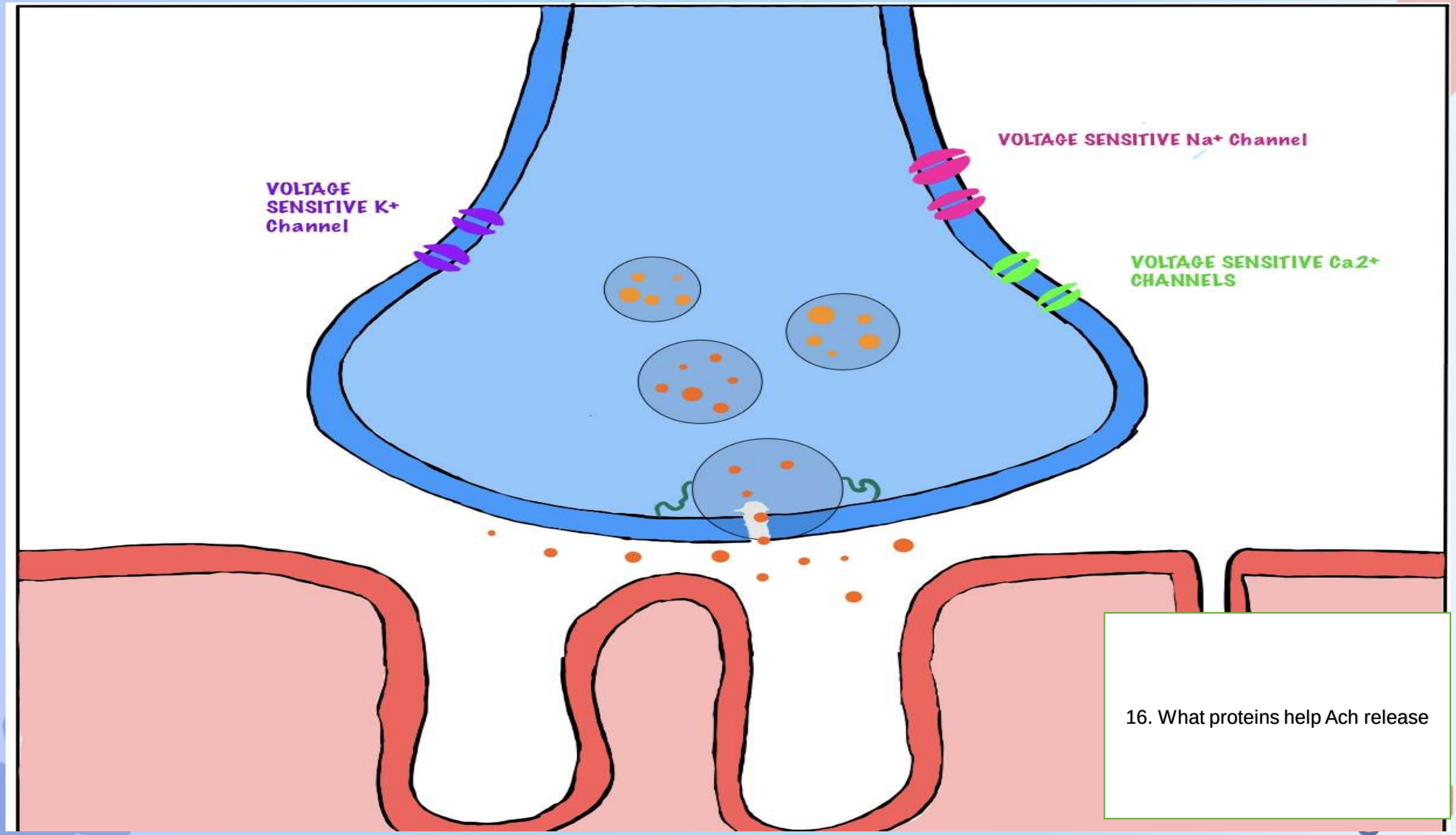
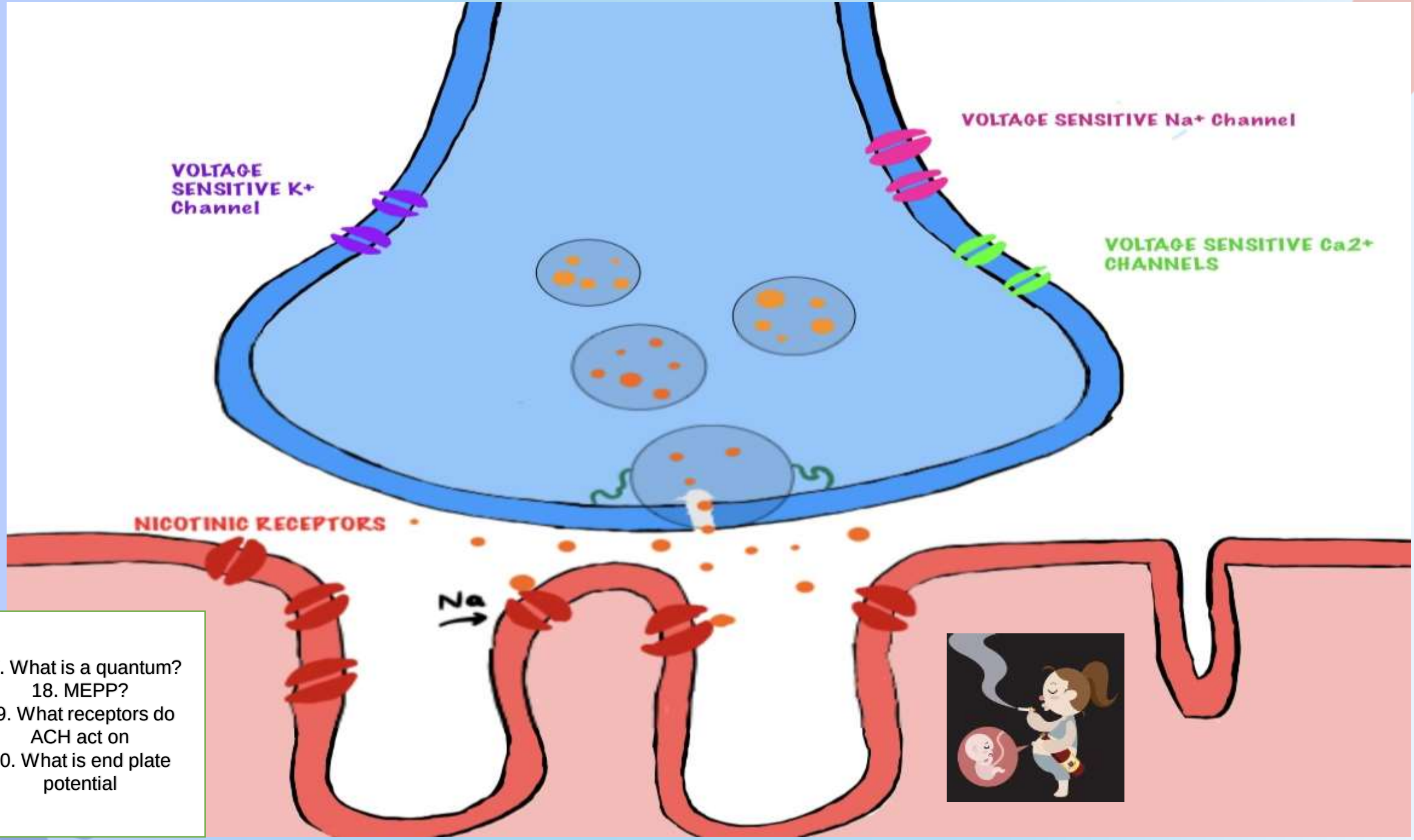


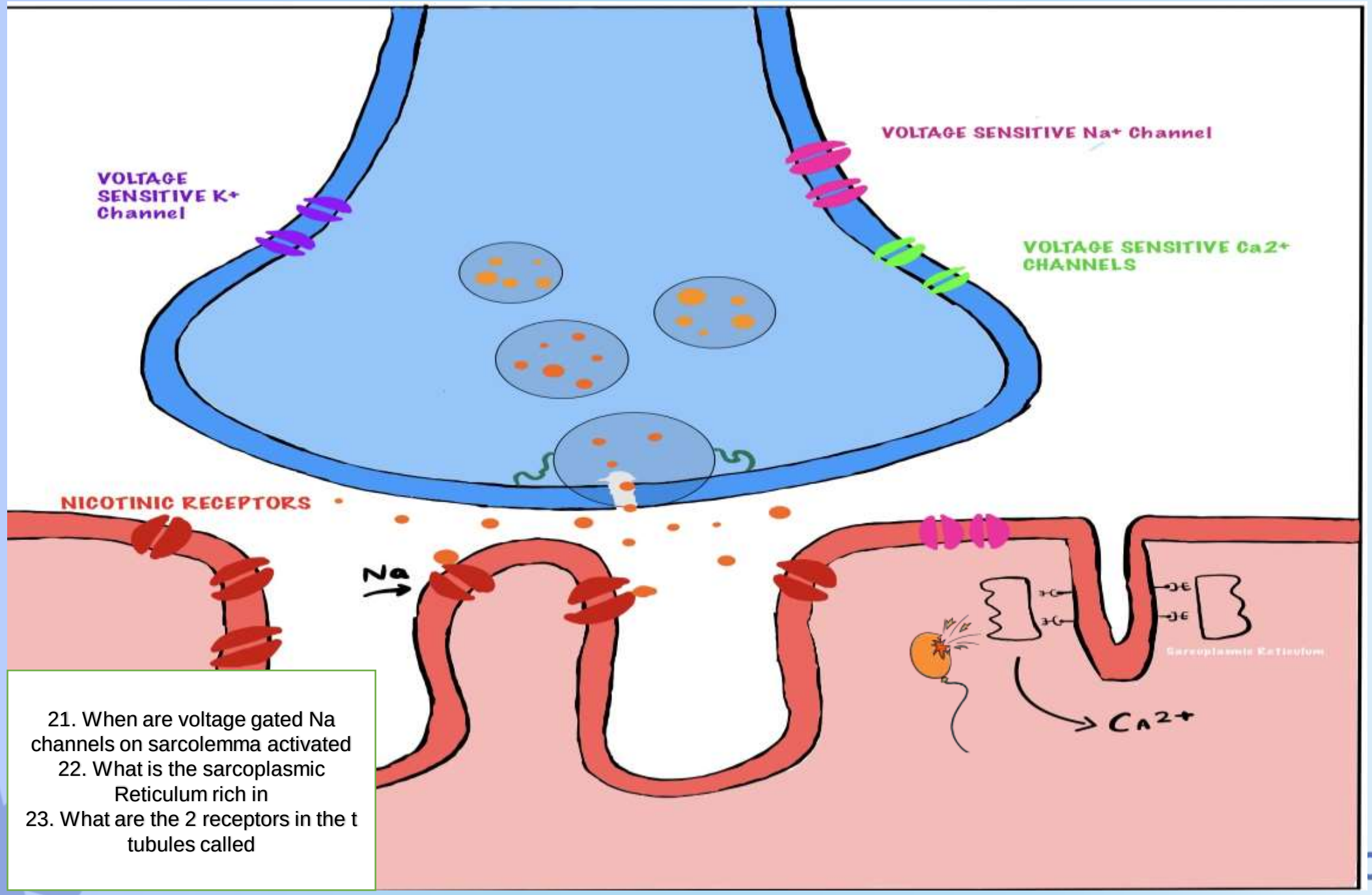
13. Where do the vesicles come from?
14. What mechanism are they transported via?
15. How do the vesicles work to release Ach



16. What proteins help Ach release



17. What is a quantum?
18. MEPP?
19. What receptors do ACH act on
20. What is end plate potential



21. When are voltage gated Na channels on sarcolemma activated
22. What is the sarcoplasmic Reticulum rich in
23. What are the 2 receptors in the t tubules called

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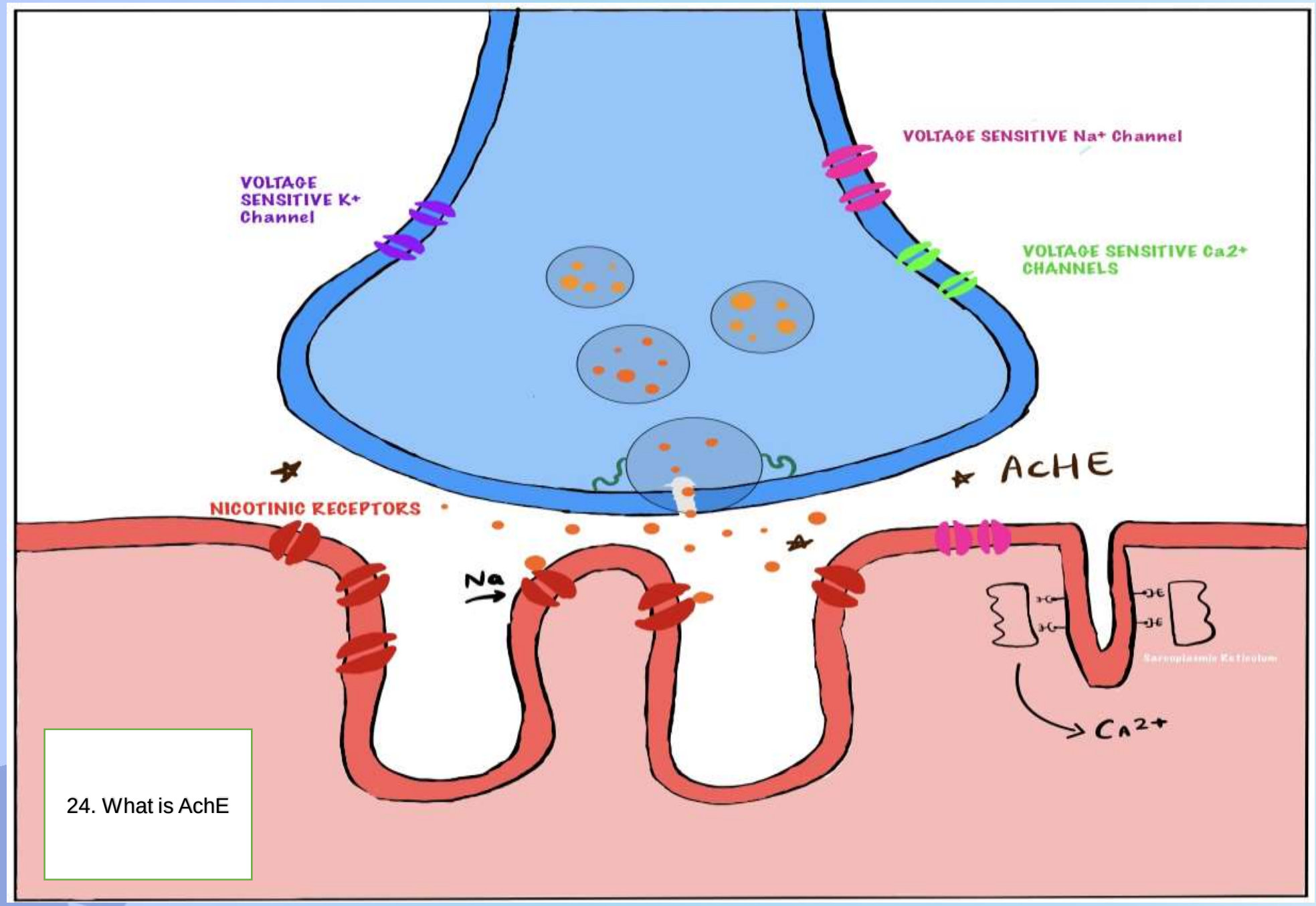

24. What is AchE

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Neuromuscular Junction Dysfunctions- CURARE

- Plant based poison
- Causes Muscle paralysis by binding to and blocking ACh receptors

25. How does curare cause muscle dysfunction?
26. How does it cause death

Neuromuscular Junction Dysfunctions- BUNGAROTOXIN

Prevents AcH from binding to receptors

27. How does bungarotoxin cause muscle dysfunction?

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Neuromuscular Junction Dysfunctions- SUCCINYLCHOLINE

- Adjunct to general anesthesia
- Intubation, Mechanical Ventilation, Surgical Procedures
- Acts like AcH
- Not destroyed by AcHE so results in prolonged depolarized state

28. How does succinylcholine cause muscle dysfunction?

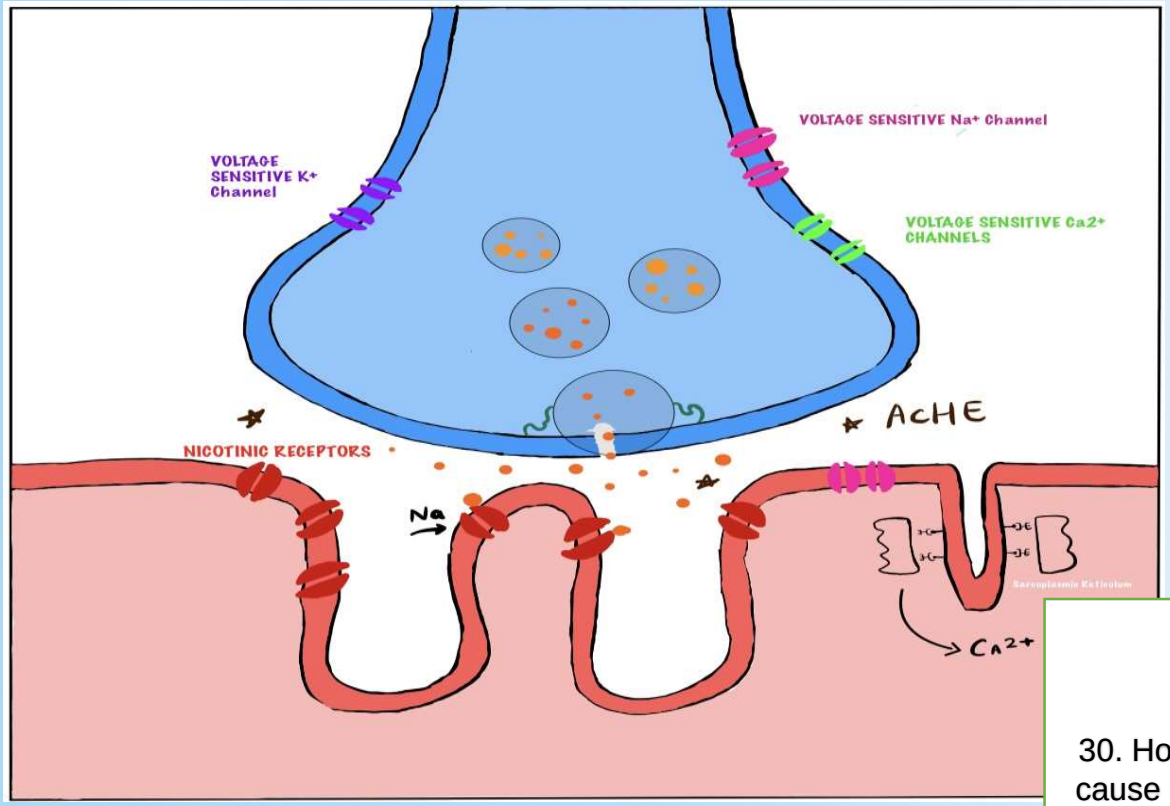
Neuromuscular Junction Dysfunctions- BOTOX

- Derived from Clostridium Botulinum
- Prevents release of ACH completely so no transmission so no muscle contraction at all.

29.. How does botox cause muscle dysfunction?

Neuromuscular Junction Dysfunctions- AChE Inhibitors (Neostigmine, Pyridostigmine)

- These drugs inhibit AchE
- Continous and repeated stimulation of muscle
- Laryngeal Spasms



30. How does neostigmine cause muscle dysfunction?

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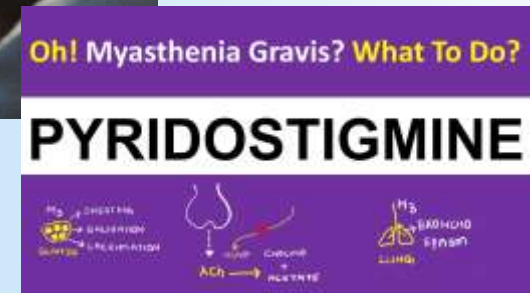
MYASTHENIA GRAVIS

- Antibodies against Nictotinic receptors
- Insufficient end plate potential leading to muscle paralysis
- Treatment : Neostigmine (AchE inhibitor)

31. What happens in myasthenia
32. How can patient without treatment die
33. What is the treatment




When you're STUDYING PHYSIOLOGY and a tear rolls into ur mouth
GOOD SOUP

QUIZ

- NMJ22VASVI