# Cogs 17: Section

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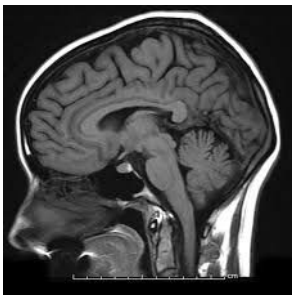
7.6.17

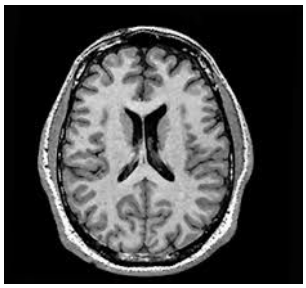
## Outline

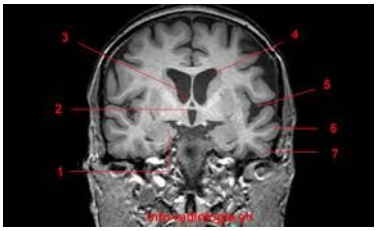
- Brief Anatomy
- Neurons and other cells
- Action Potentials
- Synapses
- Neurotransmitters
- Memorization and Study Tips

# Brief Anatomy

## Which are these 3 planes?

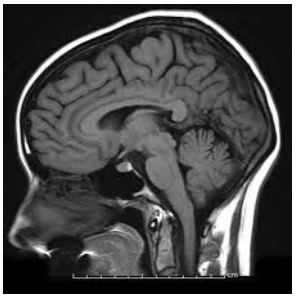




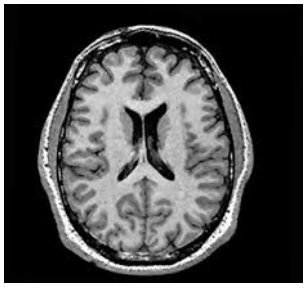



A. _____ B. _____ C. _____

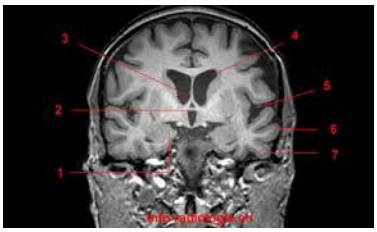
## Which are these 3 planes?



A. **Sagittal**

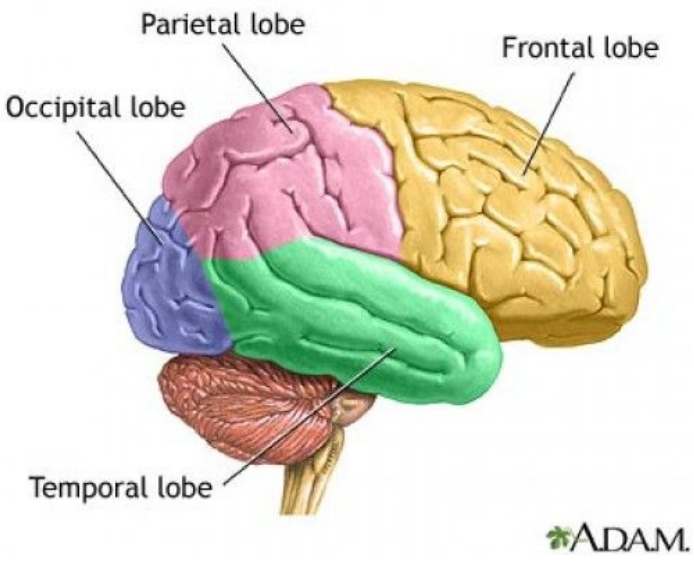


B. **Horizontal**




C. **Coronal**

## Describe the lobes of the brain



## What do these terms mean?

*"The visual cortex receives information directly from its **ipsilateral** LGN that receives signals from the **contralateral** visual field."*

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*"The visual cortex receives information directly from its **ipsilateral** LGN that receives signals from the **contralateral** visual field."*

- Ipsilateral - same side
- Contralateral - opposite side

# Neurons and other cells

## What is the function of these cells?

- Neuron -

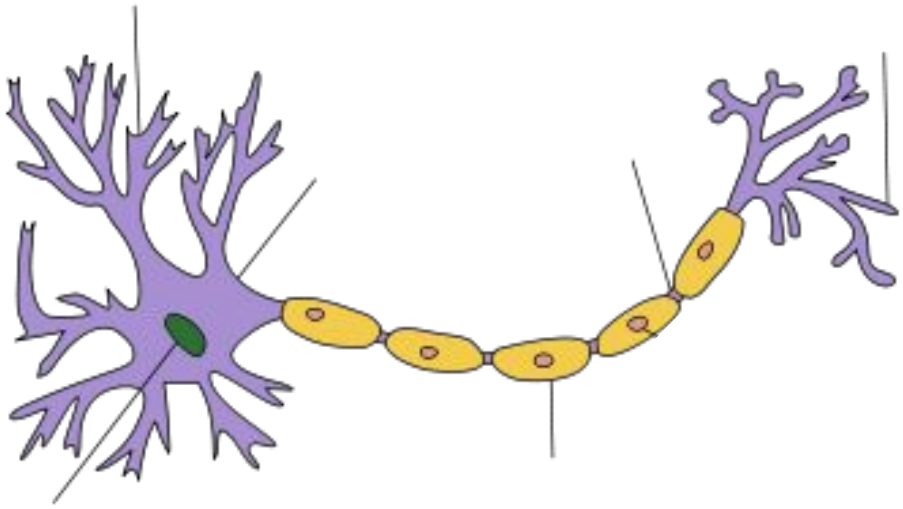
- Glia cell -

## What is the function of these cells?

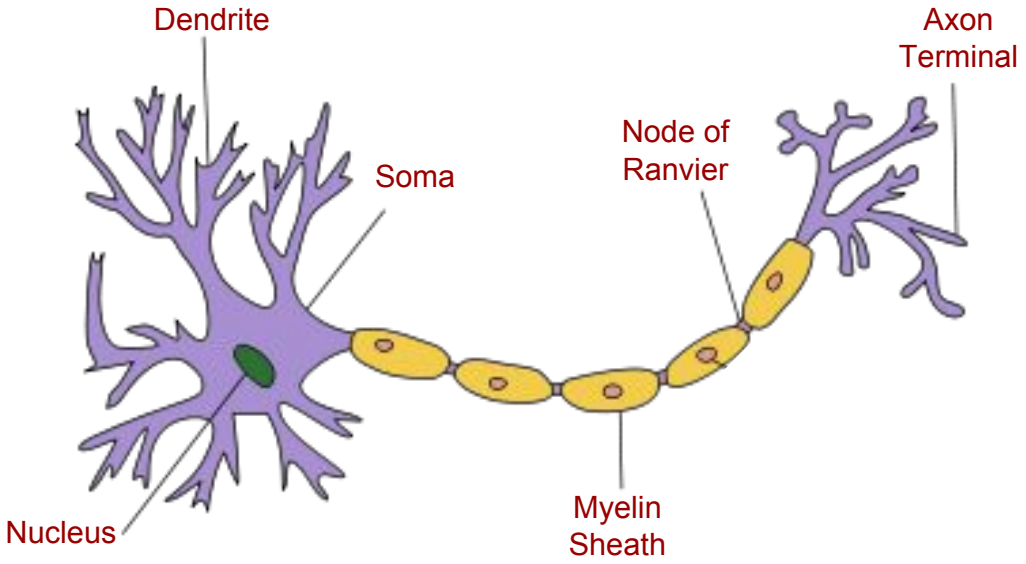
- Neuron - Transmitting information from cell to cell

- Glia cell - Support, feeding, recycling, development, myelination, etc.

## Label these neuron parts



## Label these neuron parts




# Action Potentials

## How do cells maintain equilibrium in our bodies?

- _____ - Difference in amount of a given chemical inside/outside a cell

- _____ - Difference in charge inside/outside cell

## How do cells maintain equilibrium in our bodies?

- **Concentration gradient** - Difference in amount of a given chemical inside/outside a cell

- **Electrical gradient** - Difference in charge inside/outside cell

## What is the symbol for these ions?

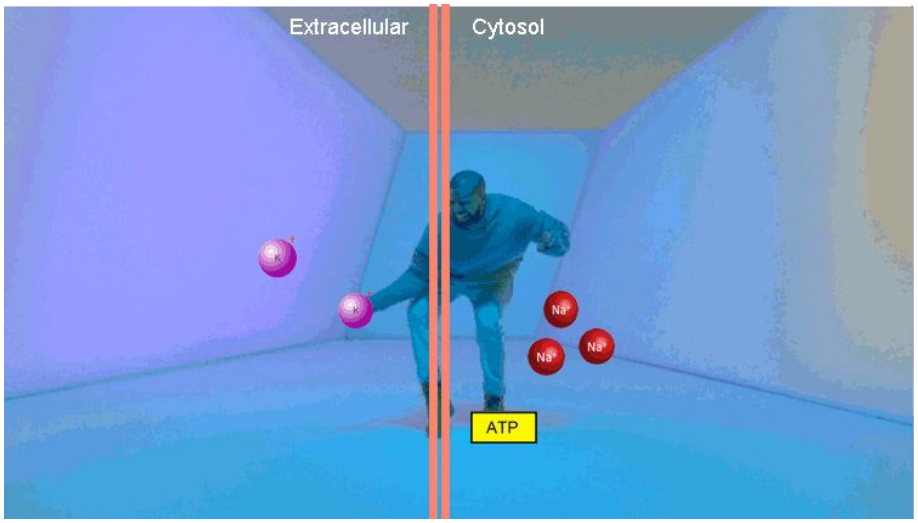
- Sodium:
- Potassium:
- Calcium:
- Chloride:

## What is the symbol for these ions?

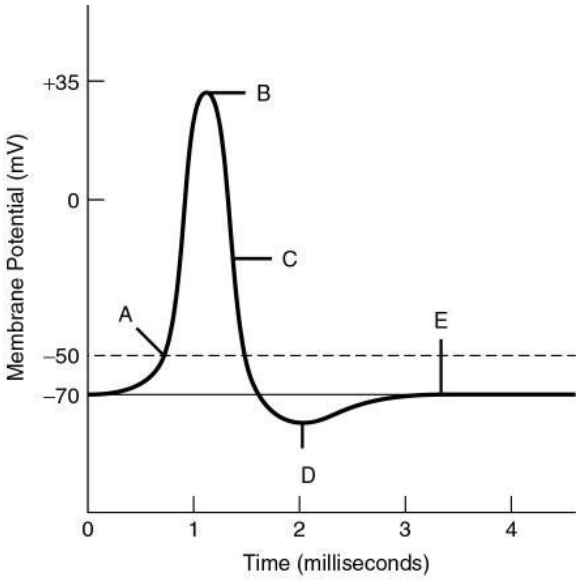
- Sodium: **Na+**
- Potassium: **K+**
- Calcium: **Ca++**
- Chloride: **Cl-**

## What is the Sodium-Potassium Pump?

## 3 Na+ OUT/2 K+ IN



## Label and describe the steps of an action potential

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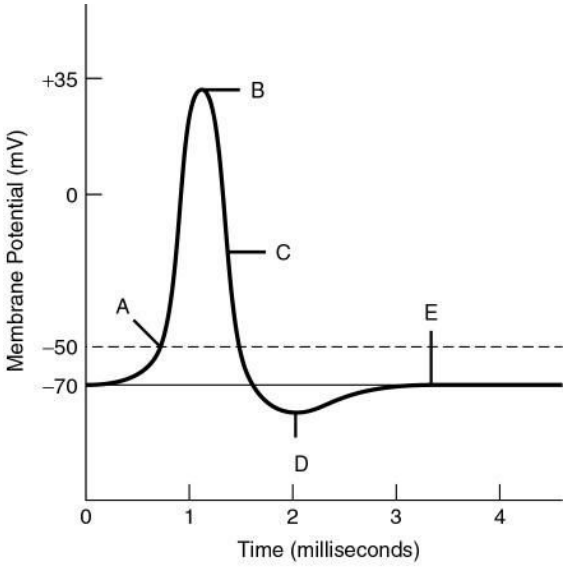



A. Threshold
B. Action potential - Ca++ enters cell
C. Repolarization - K+ leaves cell
D. Hyperpolarization
E. Restoring the resting potential

## Other Key Terms and Concepts

- Refractory period -

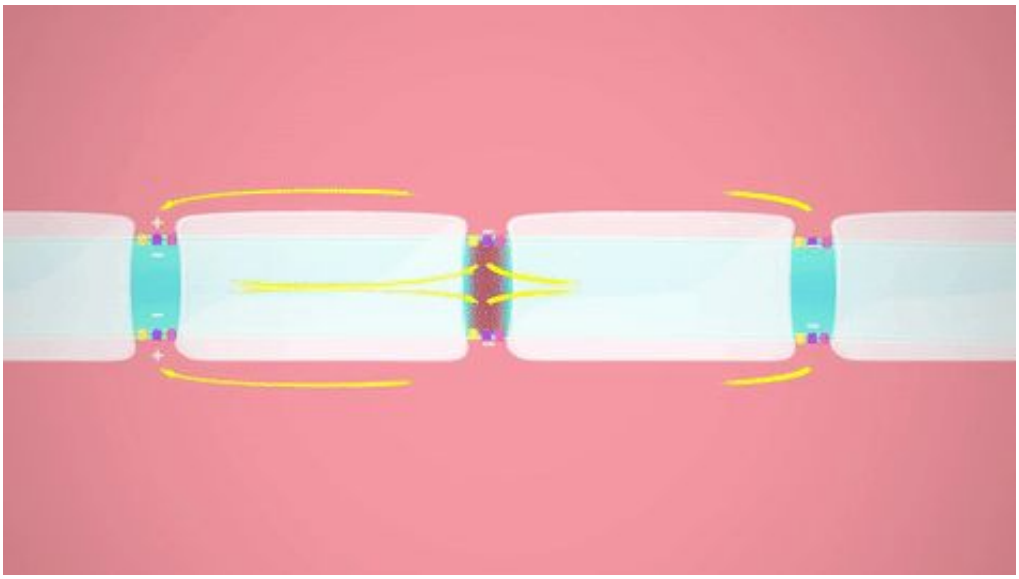
- All-or-none law -

## Other Key Terms and Concepts

- Refractory period - Period in which a cell is being re-polarized and cannot fire an action potential again

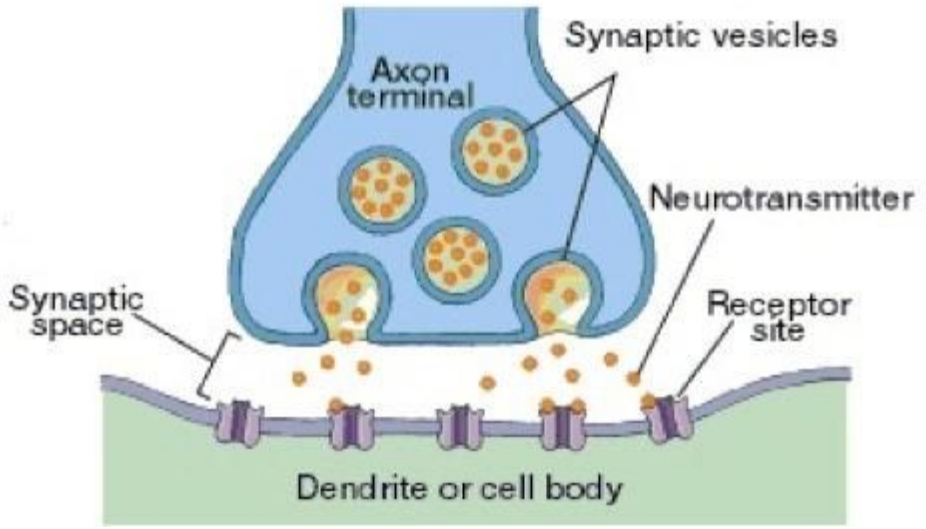
- All-or-none law - if an action potential fires, it always has the same amplitude or velocity, regardless of stimulus

**How does myelin aid in conduction velocity?**



# Synapses

## How are NTs transferred between neurons?




## NTs can have 2 effects on postsynaptic cell

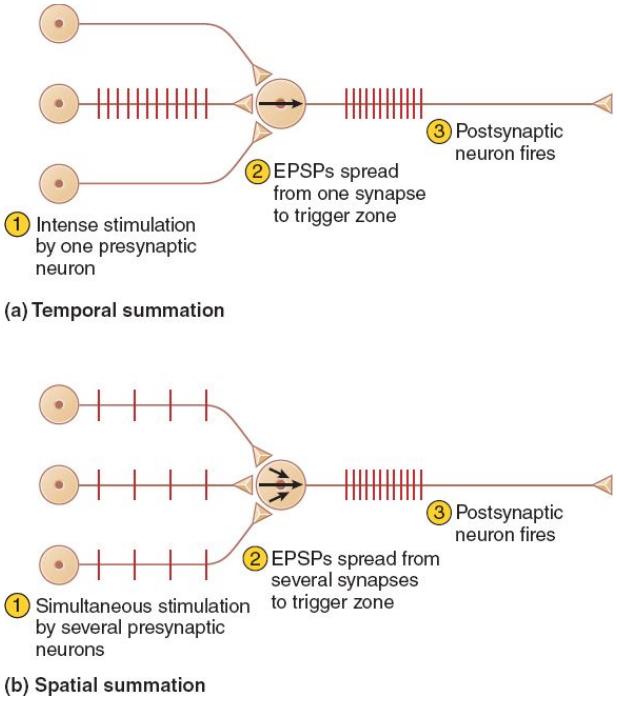
- EPSP -
- IPSP -

## NTs can have 2 effects on postsynaptic cell

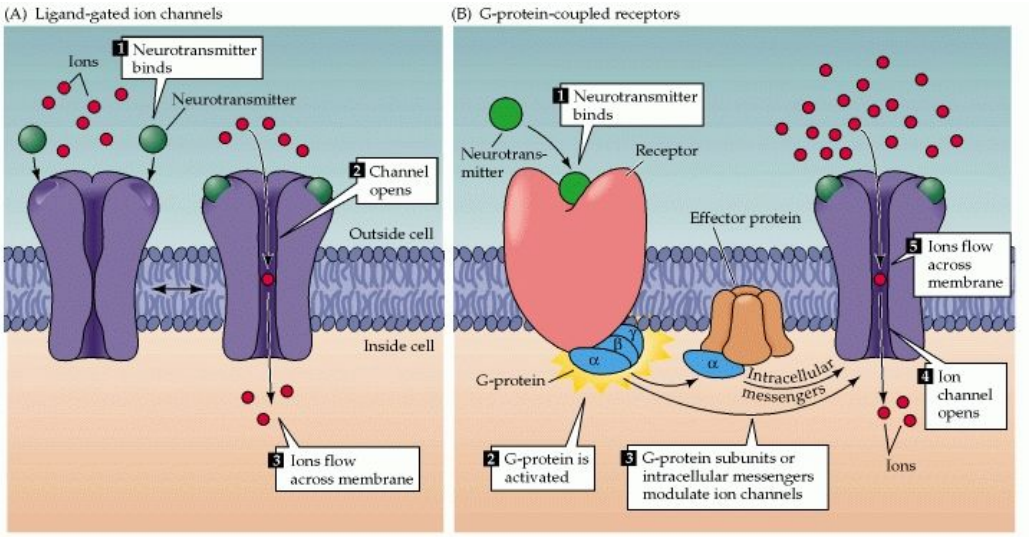
- EPSP - Excitatory Post-Synaptic Potential; increases likelihood of releasing NT because cell becomes *hypo-polarized*

- IPSP - Inhibitory Post-Synaptic Potential; decreases likelihood of releasing NT because cell becomes *hyper-polarized*

## What is the difference between temporal and spatial summation?



## 2 mechanisms for how NTs affect the postsynaptic cell




# Neurotransmitters

## What's the difference between agonists and antagonists?

- Agonist -
- Antagonist -

## What's the difference between agonists and antagonists?

- Agonist - agonist increases effect of NT
- Antagonist - antagonist decreases effect of NT

## Main Neurotransmitters

- ACh - neuromuscular junction, arousal
- GABA - suppresses cortical activity, regulate anxiety
- Glutamate - learning, perception
- Serotonin (5-HT) - sleep, mood regulation
- Dopamine - reward, reinforcement
- Norepinephrine/Noradrenaline - arousal, attention
- Substance P - pain
- Endorphins - counteract substance P
- Hormones - e.g. oxytocin, insulin, cortisol