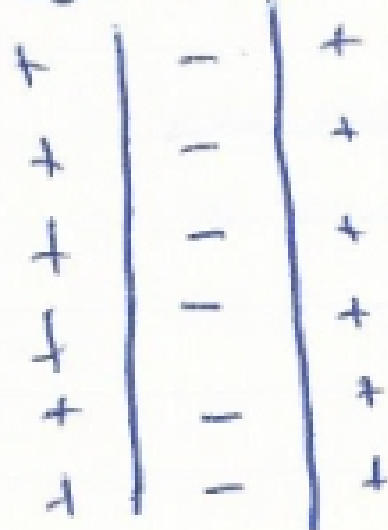


# Electrochem / AP

Neuron



RMP = -70mV

Ion begins polarized

$\text{Na}^+$  in = EPSP     $\text{Cl}^-$  in = **EPSP**

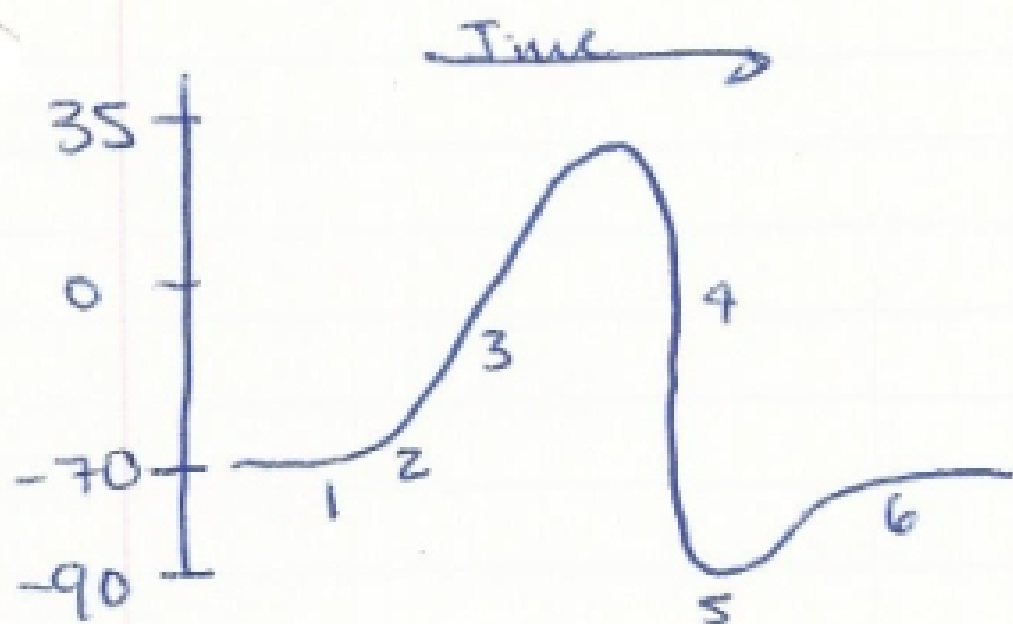
Axon Hillock

Sums action potentials

- Spatial Summation = 2 EPSPs near each other add up

- Temporal Summation = potentials close in time add up.

\* Threshold, all-or-nothing, AP = +35mV



1. EPSP Summation + ligand gated  $\text{Na}^+$  channels
2. Threshold reached, Voltage gated  $\text{Na}^+$  channels
3. Depolarization,  $\text{Na}^+$  floods in.  $\text{Na}^+$  closes, Volt  $\text{K}^+$  opens
4. Repolarization,  $\text{K}^+$  leaves. Cell can't fire again,  $\text{Na}^+$  chan. deactivated
5. Hyperpolarization, prevent backflow
6.  $\text{K}^+$  close,  $\text{Na}^+/\text{K}^+$  pumps restore concentration gradient

- TTX blocks  $\text{Na}^+$  gate, cell can't fire
- $\text{K}^+$  blockers, cell stays depolarized

MS = demyelination of axons

# AP and NTM

10/11/20

When voltage ~~is~~ Action potential reaches axon terminal, voltage gated  $Ca^{2+}$  rushes in, triggers NTM vesicles release



# Neurotransmitters

Acetylcholine: attn/memory  
Basal Nucleus  
Projects to Frontal, hippocampus  
Enhanced by Caffeine

Acetyl = sugars      choline = from Lecithin

Alzheimer's D. = loss of ACh neurons, treatment  
blocks acetylcholinesterase

Norepinephrine: arousal  
Locus Coeruleus  
projects to cortex, cerebellum, Hypothal.  
Made from diet → dopa → Nore

LC regulates level of arousal  
Nore regulates link b/w brain + metabolism

Serotonin: Sleep, dreaming, mood  
raphae nucleus in B. stem  
Projects everywhere  
made from tryptophan

Serotonergic Neurons: active rapidly when awake,  
slow w/ SWS, NONE in REM

~~Hallucinogens turn off Serotonergic neurons~~

Hallucinogens turn off Serotonergic neurons,  
stimulate 5HT<sub>1A</sub>

Synesthesia: Individ. has multimodal perceptual  
experiences.

Serotonin levels linked w/ anxiety + depression