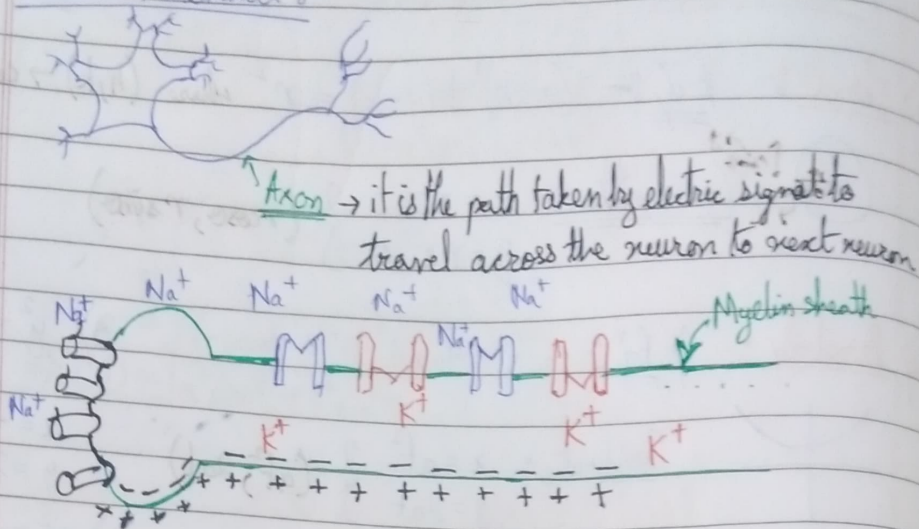
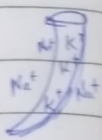


Action Potential:-



In the outside we have higher concentration of Na^+
In the inside we have higher concentration of K^+



- During rest phase :- The neuron is not actively transmitting a signal.

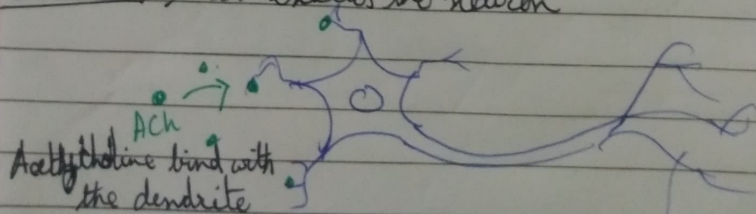
\therefore Its membrane potential = -70mV

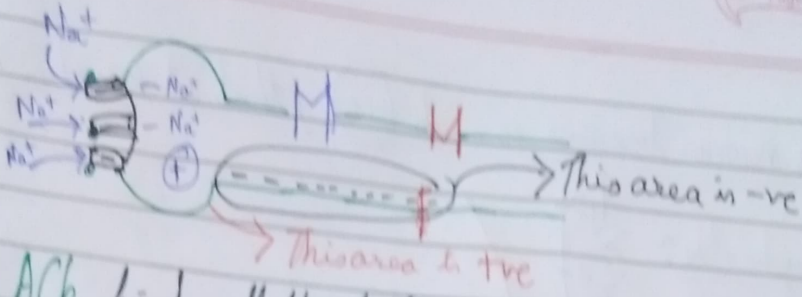
How do we excite the neuron?

- During excited phase :- The neuron is actively transmitting an action potential.

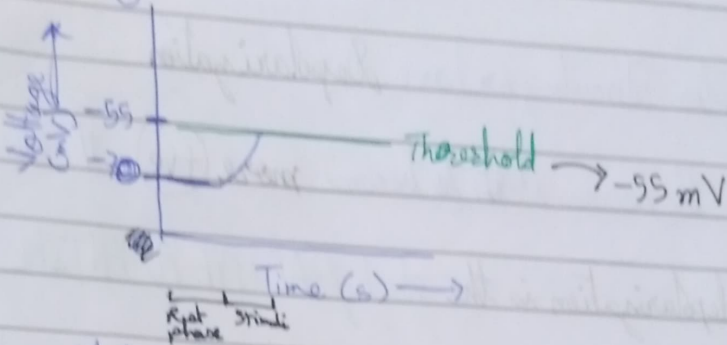
Eg:- For movement of our arms, we have Acetylcholine (ACh). It is a neurotransmitter that plays important role in muscle movement and brain function.

For action potential to be generated, there has to be a stimulus that excites the neuron





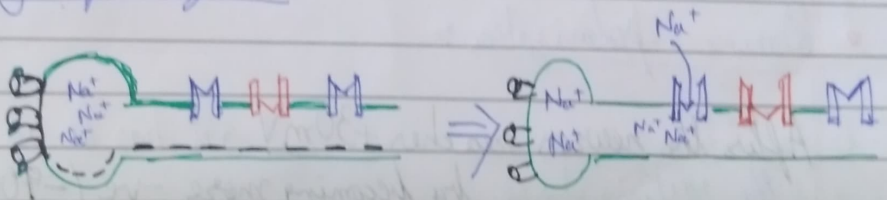
The ACh binds with the dendrites to allow Na^+ ions to flow into it
graphically:-



The more Na^+ ions flow into the neuron,
The more (+ve) the neuron gets and reaches threshold

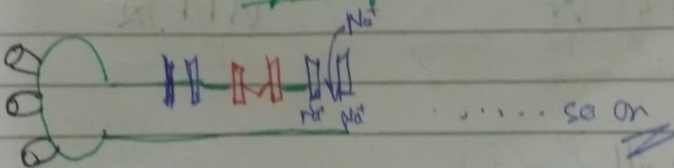
When the neuron gets +ve enough to reach -55 mV
the action potential is likely to fire.

• During Depolarization:-

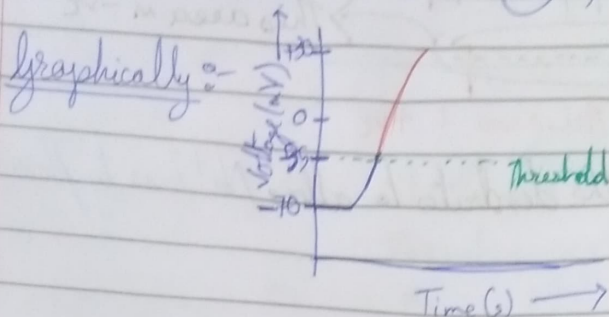


These Na^+ ions are gonna trigger ~~the~~ sodium-gated voltage channels that go all along the axon.

More Na^+ ions enter into the neuron through the opened voltage gate of sodium. Then, these Na^+ ions trigger the next voltage gated sodium channel to open up



The neuron became so much (+ve), that it reaches $+30\text{mV}$

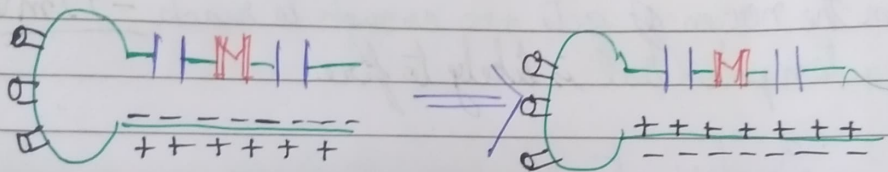


After Stimuli, we have Depolarization

When the neurons starts to become more (+ve), the neuron is depolarized

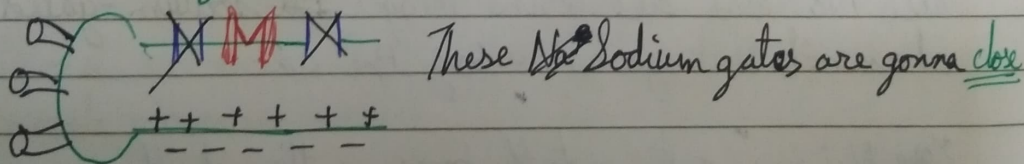
This depolarization is the start of ACTIVE POTENTIAL

This means the Na^+ ions rushes into the neurons and create more +ve in the inside, causing it to become more -ve on the outside

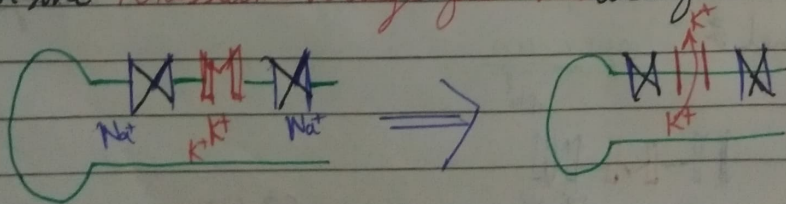


During Repolarization :-

After the neuron reaches $+30\text{mV}$ it has to go back to the resting phase by becoming more -ve (-70mV)

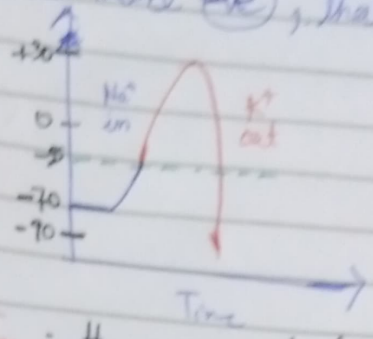


Then the Potassium voltage gated ions are gonna open up



The K^+ ions will flow out

The neuron becomes more $-ve$, that it reaches graphically :-



• **Repolarization** is the process of closing sodium voltage gate and opening the potassium voltage gate to allow the K^+ ions to flow out

Q. During Hyperpolarization :-
Why it becomes $-90mV$ and not $-70mV$

→ In order for neuron to become more $-ve$

Ans:- This is because :-

- i) We have a lot of K^+ ions leaving the cell
- ii) It takes longer time for potassium voltage gates to close, that in the graph, it undershoots & reach $-90mV$

• This phase is called **Hyperpolarized / Refractory period**

In this phase, the neuron is recharging and makes it harder for neuron to generate another active potential

• Goes Back to Resting Phase :-

