

# Action Potentials

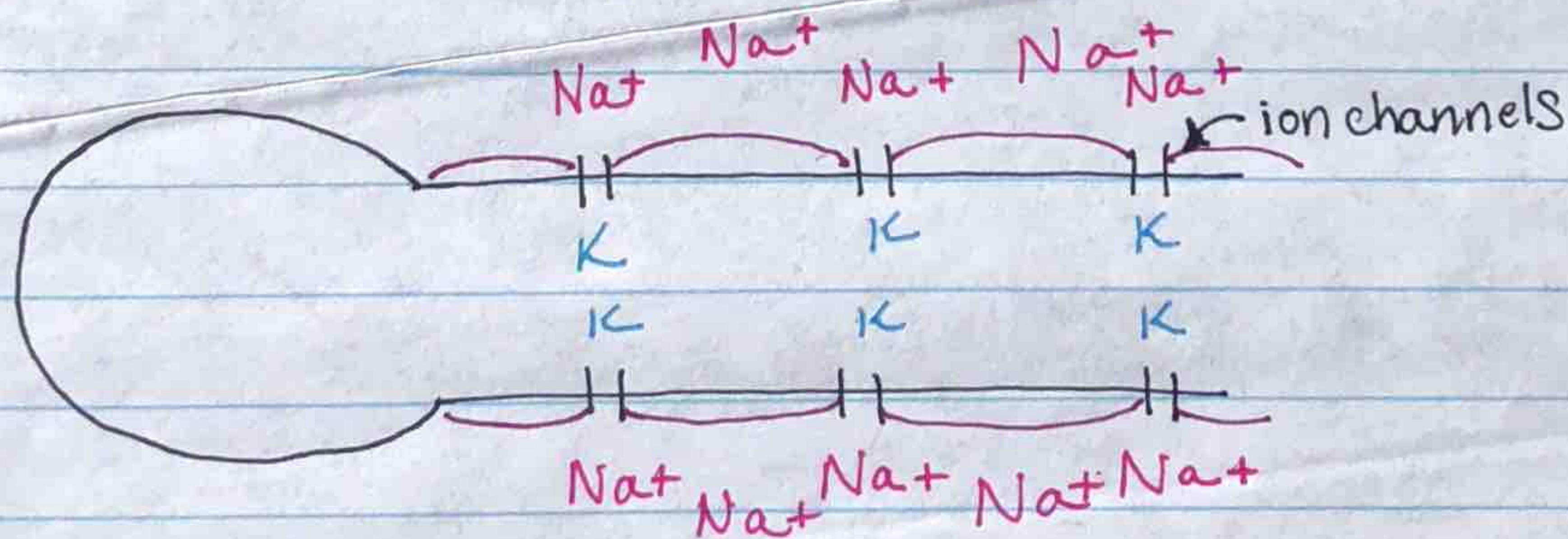
When a neuron gets enough stimulation it sends an electrical impulse (signal)... action potential!

- all signals are the same strength/speed
- Signals vary in frequency depending on what it's trying to relay

## 5 Stages

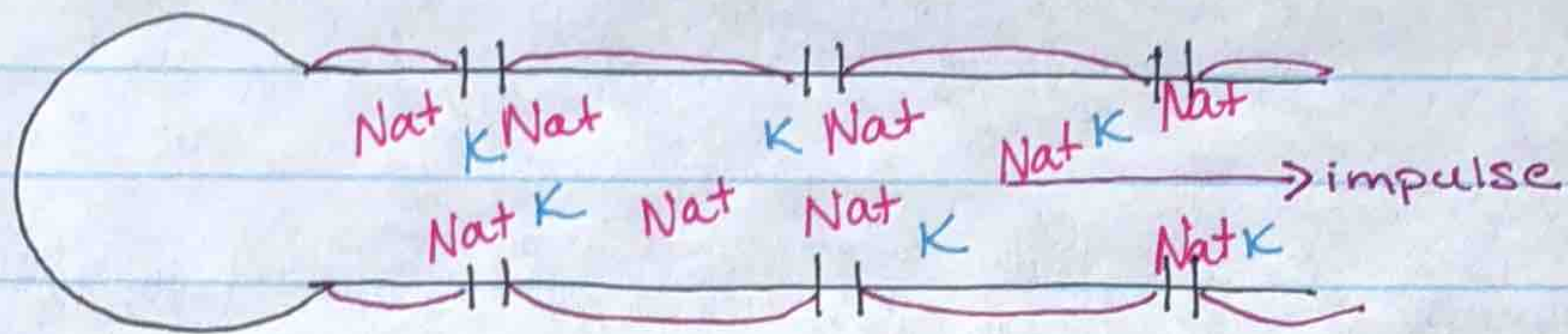
### 1. Resting membrane potential

- no impulse
- Sodium (Na<sup>+</sup>) in high concentration on the outside, Potassium (K<sup>+</sup>) high concentration on the inside with negatively charged proteins



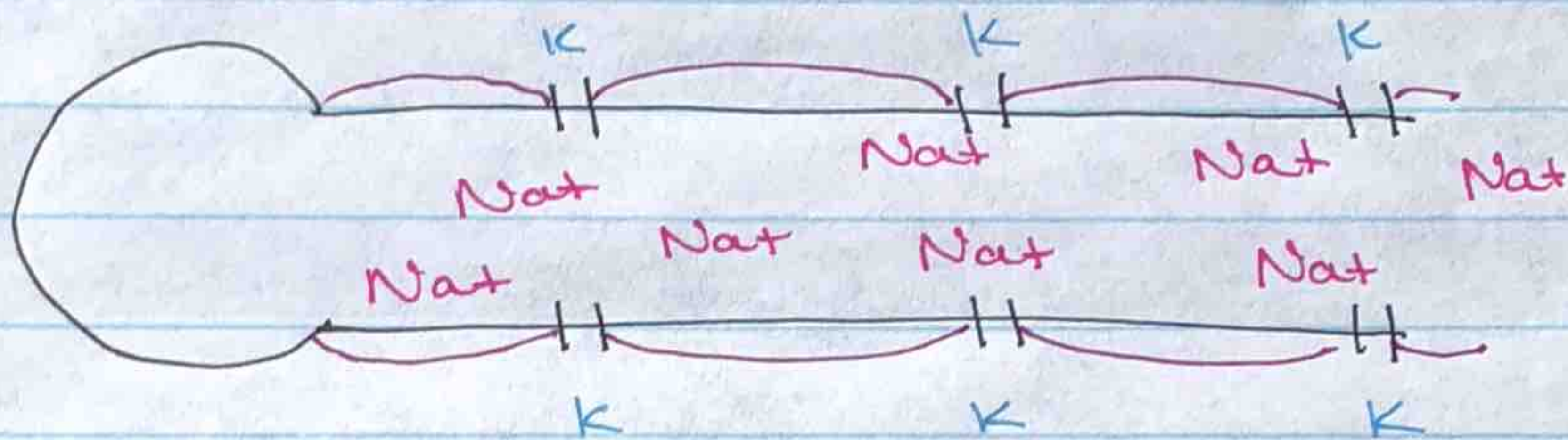
### 2. Depolarization

- stimulus occurs and opens sodium channels
  - if enough  $\text{Na}^+$  crosses it triggers an action potential and as the impulse moves it triggers more channels and  $\text{Na}^+$  rushes in
- ↳ "All or nothing" if the stimulus is too weak it goes back to resting



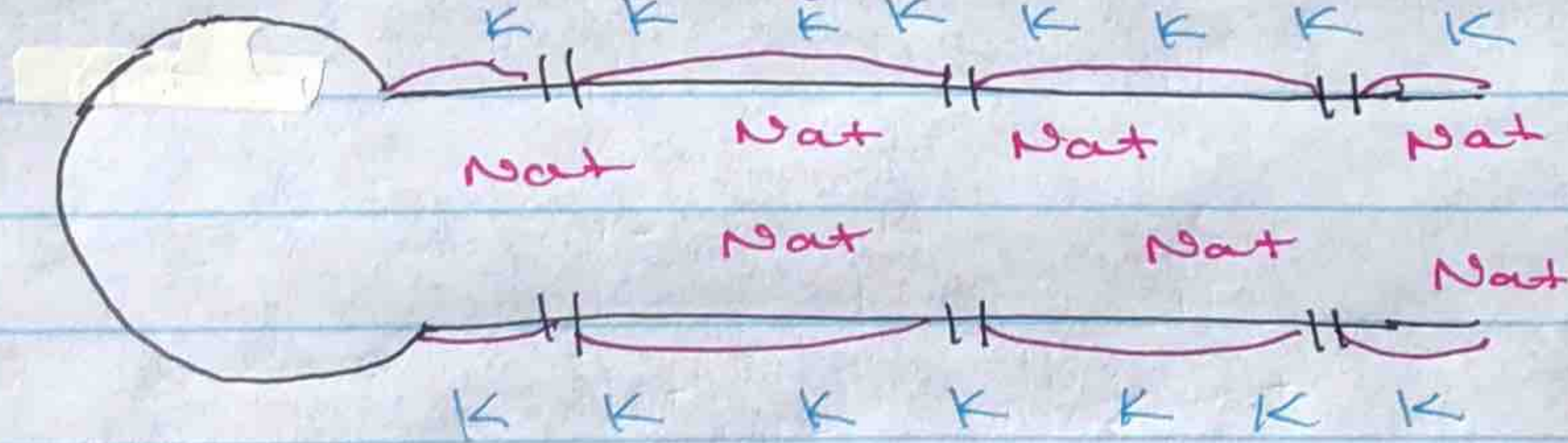
### 3. Repolarization

• in an attempt to rebalance the charges potassium (K) channels open up and let K out



### 4. Hyperpolarization

• cell has released too many K ions and becomes more negative inside than resting



### 5. Refractory Period

• sodium potassium pump helps reset everything, pumps out 3 Na+ and 2 K each time

