

Membrane potential

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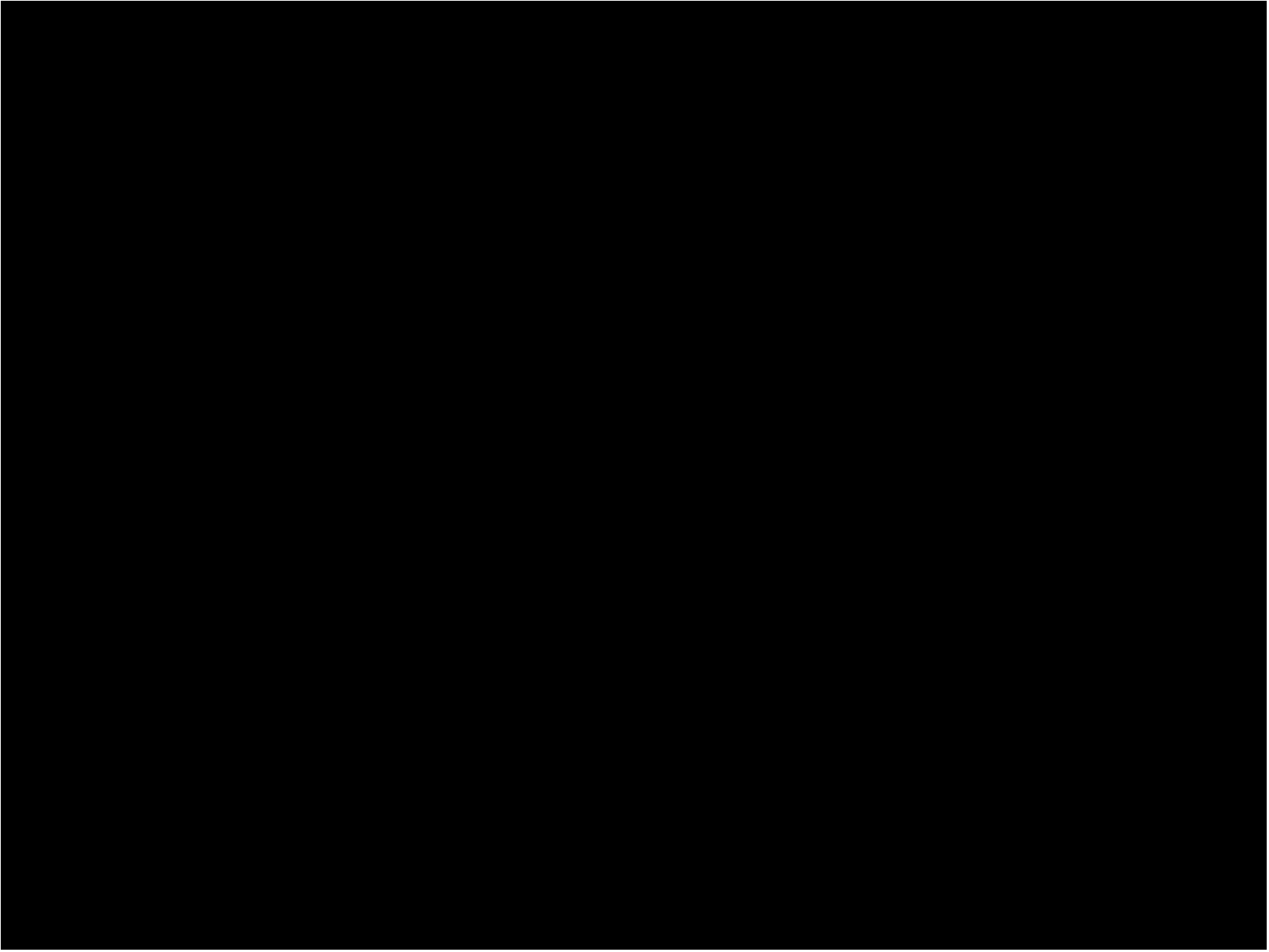
Department of Biophysics

Membrane potential

- In all type of cells, there is an **electrical potential difference** between the inside of the cell and the surrounding extracellular fluid. This is termed the **membrane potential** of the cell.

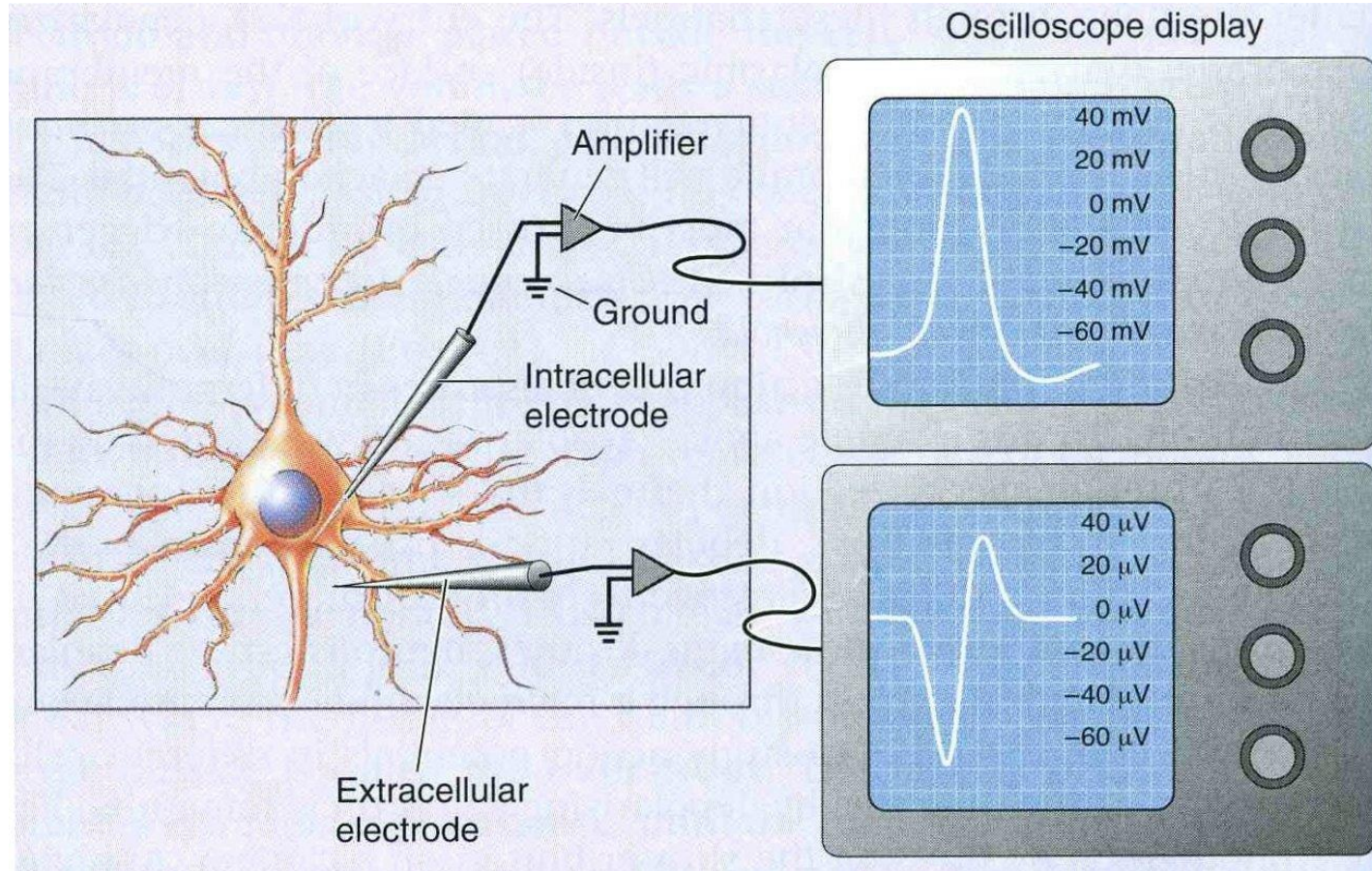
Membrane potential

- Membrane potentials in cells are determined primarily by three factors:
- **1)** the concentration of ions on the inside and outside of the cell;
- **2)** the permeability of the cell membrane to those ions (i.e., [ion conductance](#)) through specific [ion channels](#);
- **3)** by the activity of **electrogenic** pumps (e.g., [Na⁺/K⁺-ATPase](#) and [Ca⁺⁺ transport pumps](#)) that maintain the ion concentrations across the membrane.



Action potential Properties

Measurement



Action potential Properties

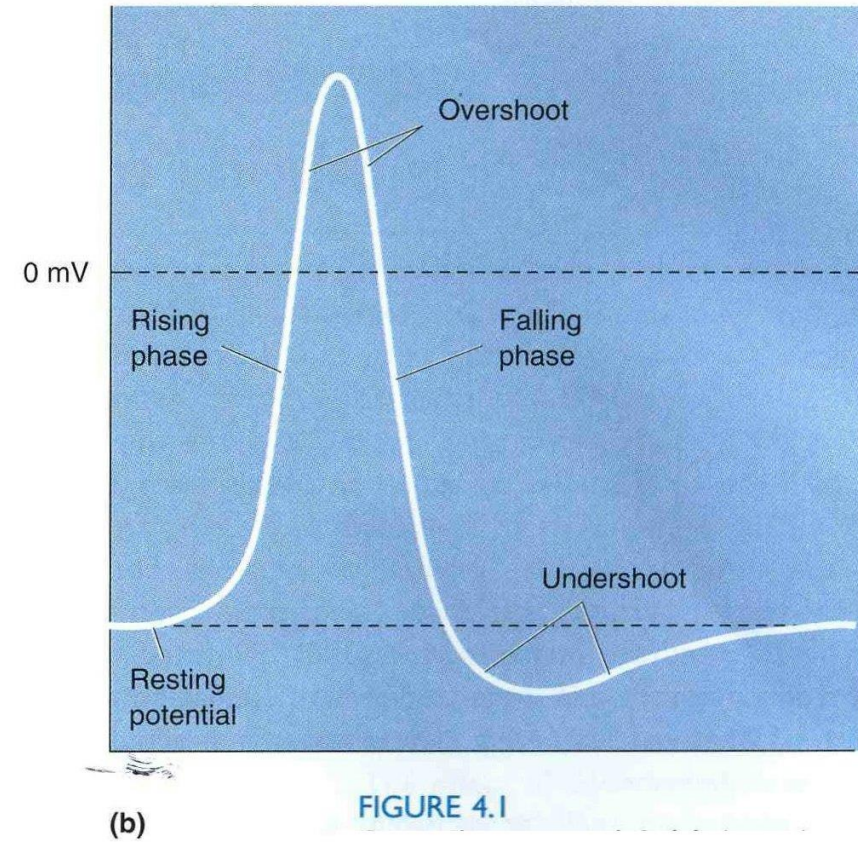
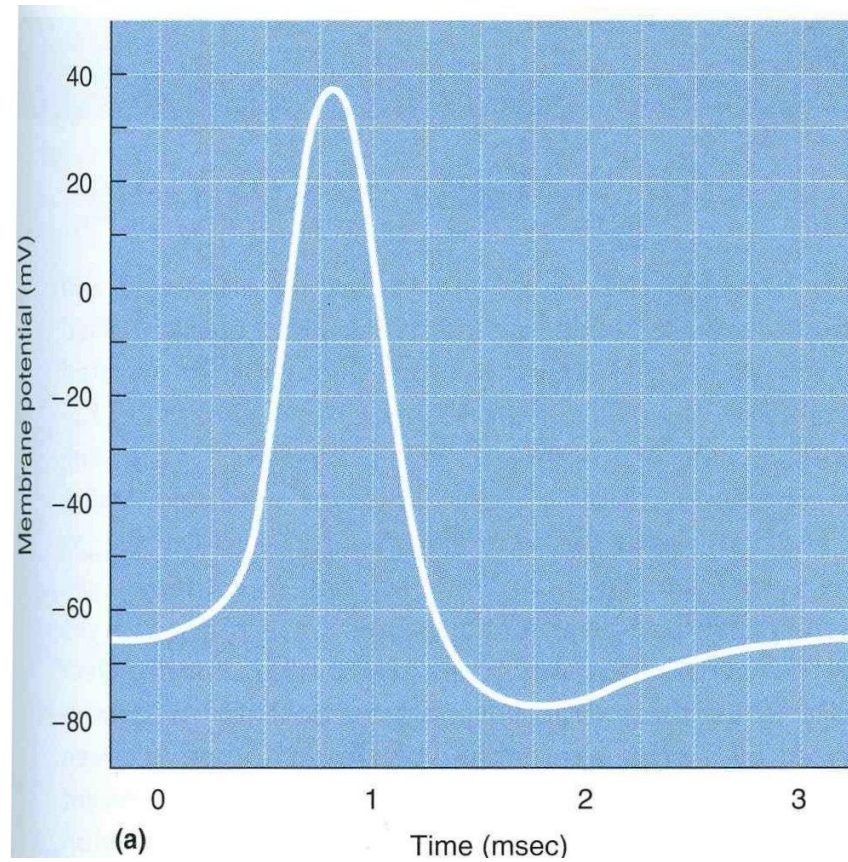
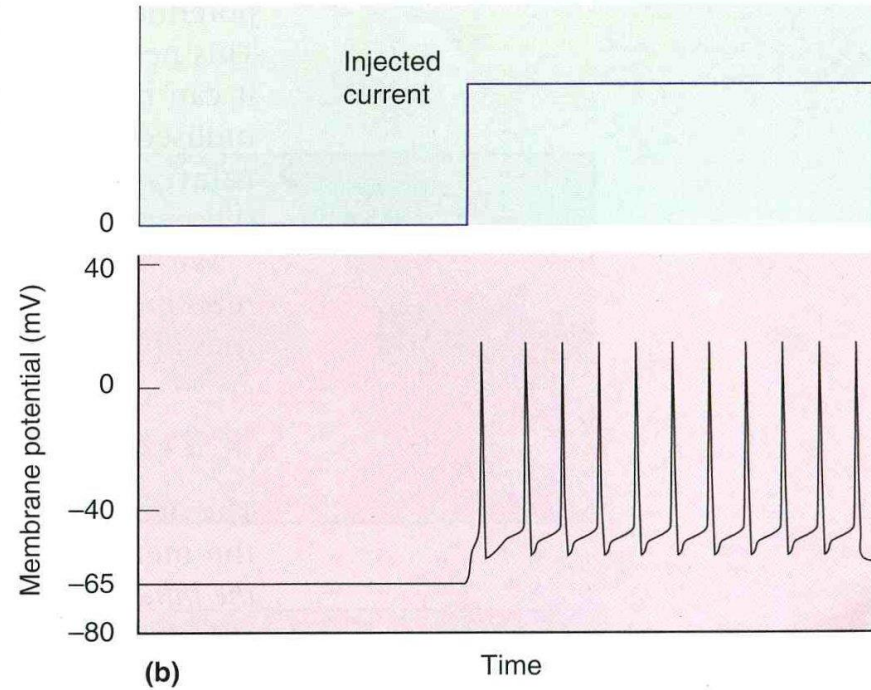
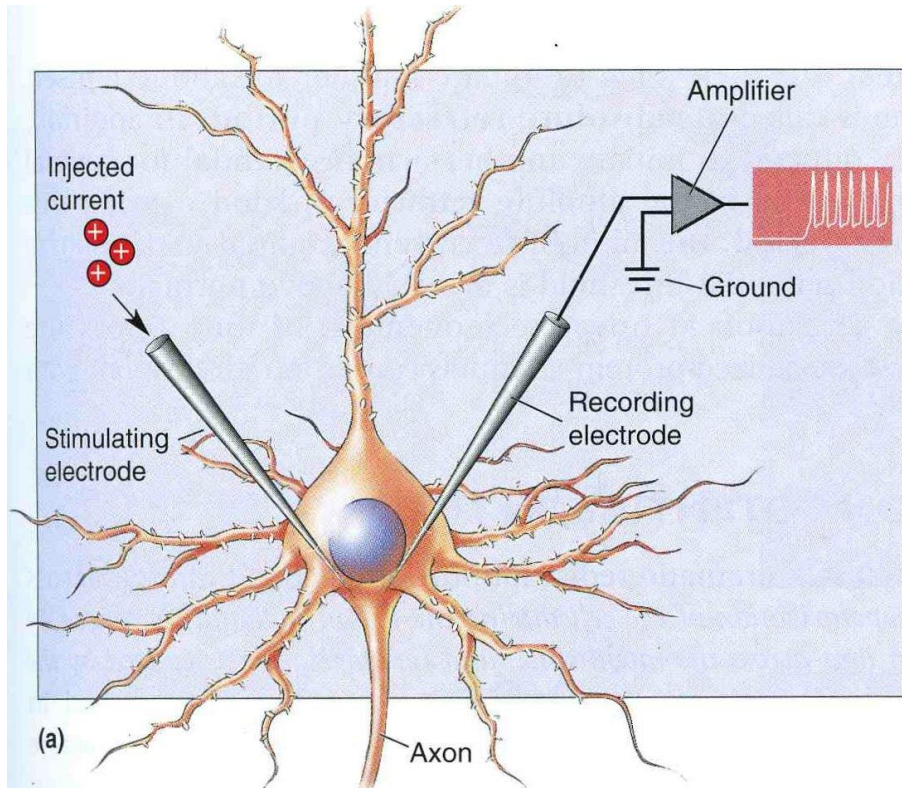


FIGURE 4.1

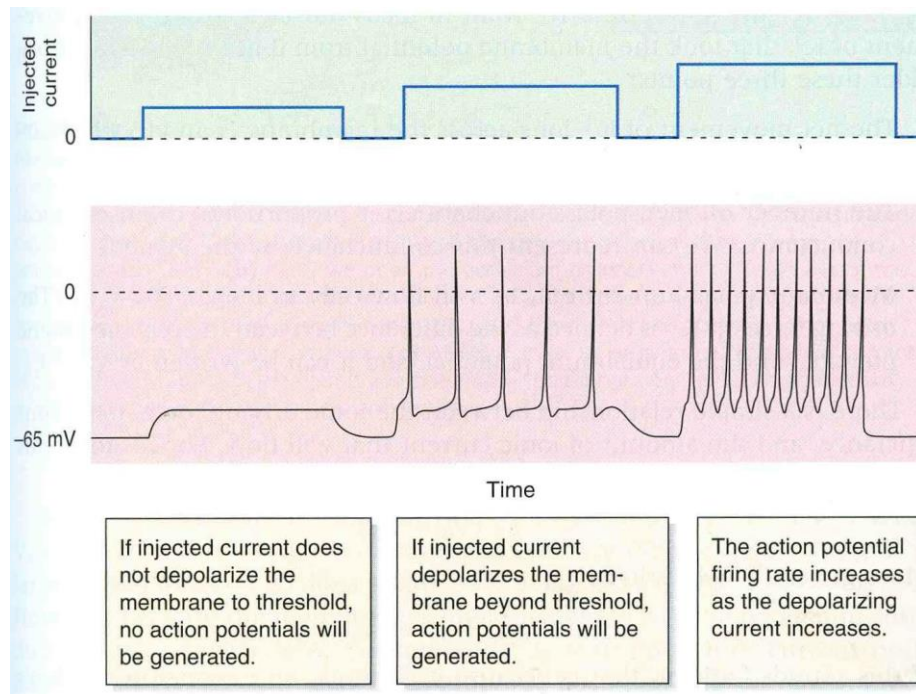
Action potential Properties

Generation

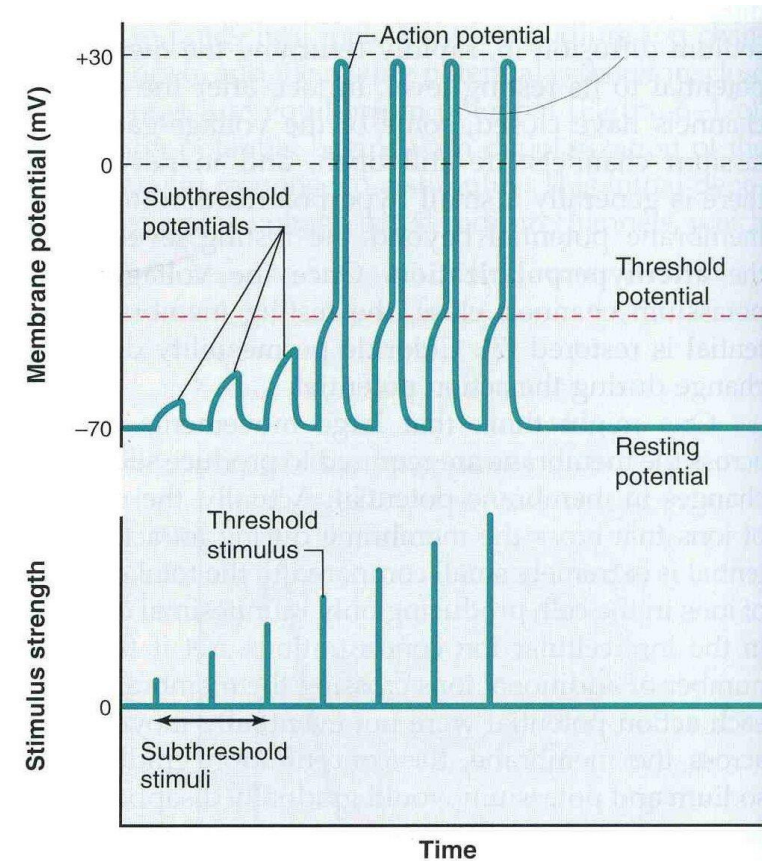


Action potential Properties

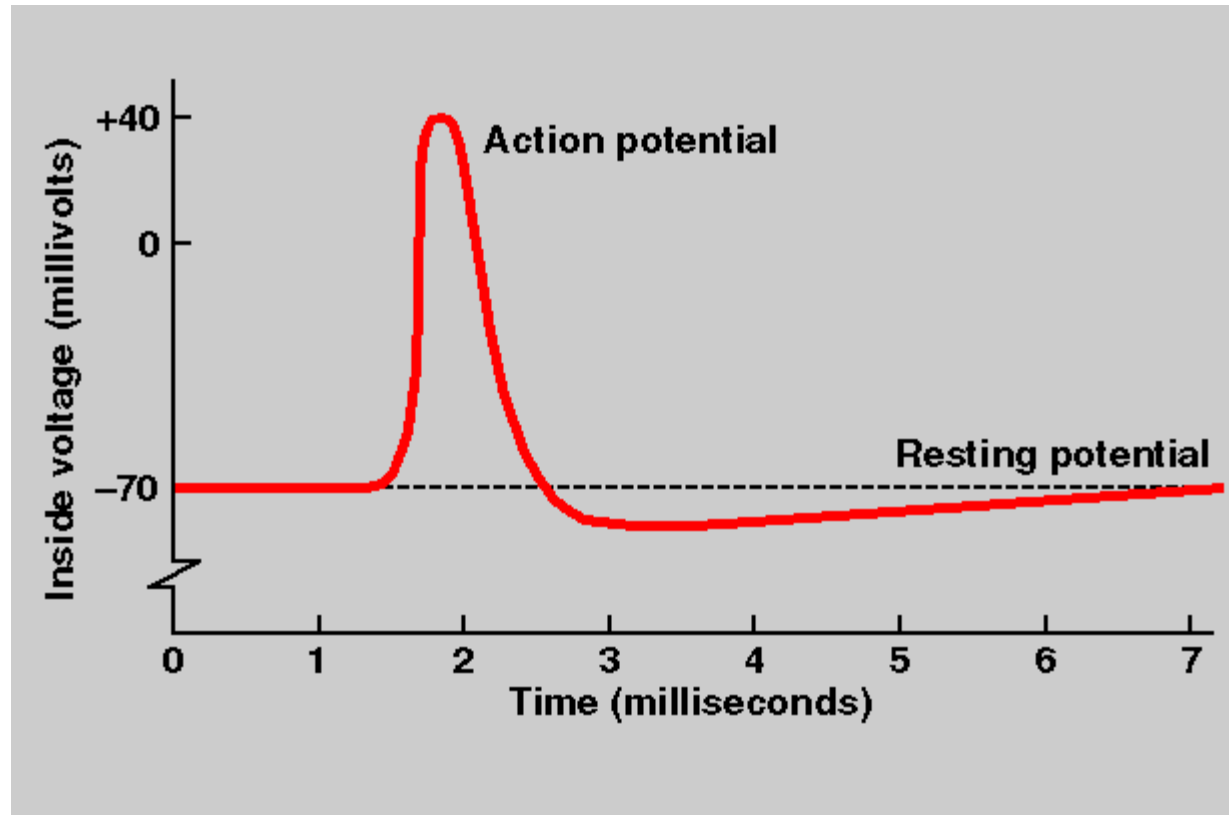
- **Concept of threshold**
- **Concept of all-or-none**



Generation



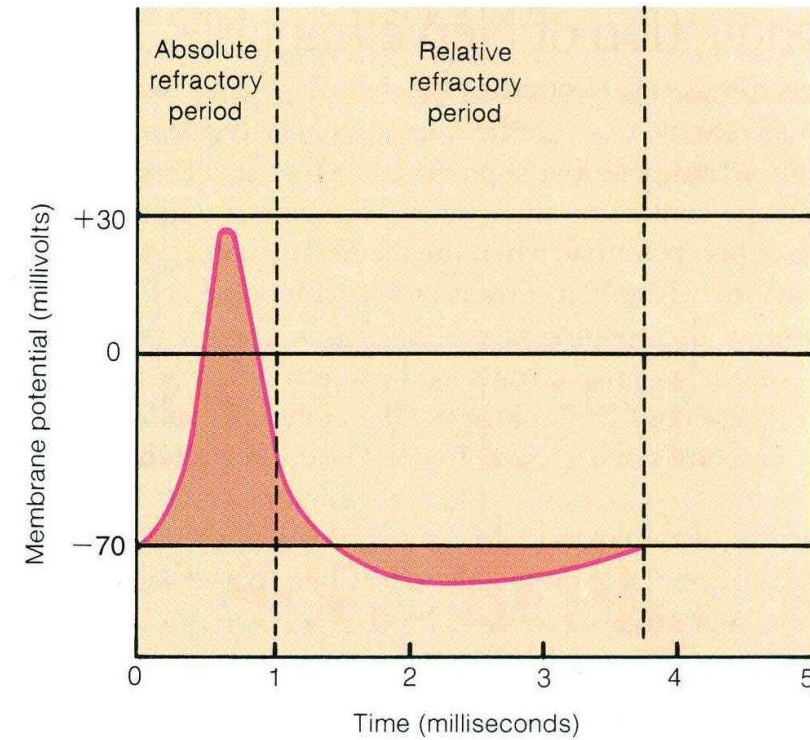
Action Potential = ALL x NOTHING



Action potential Properties

Generation

- **Absolute refractory period**
- **Relative refractory period**



action potential propagation

