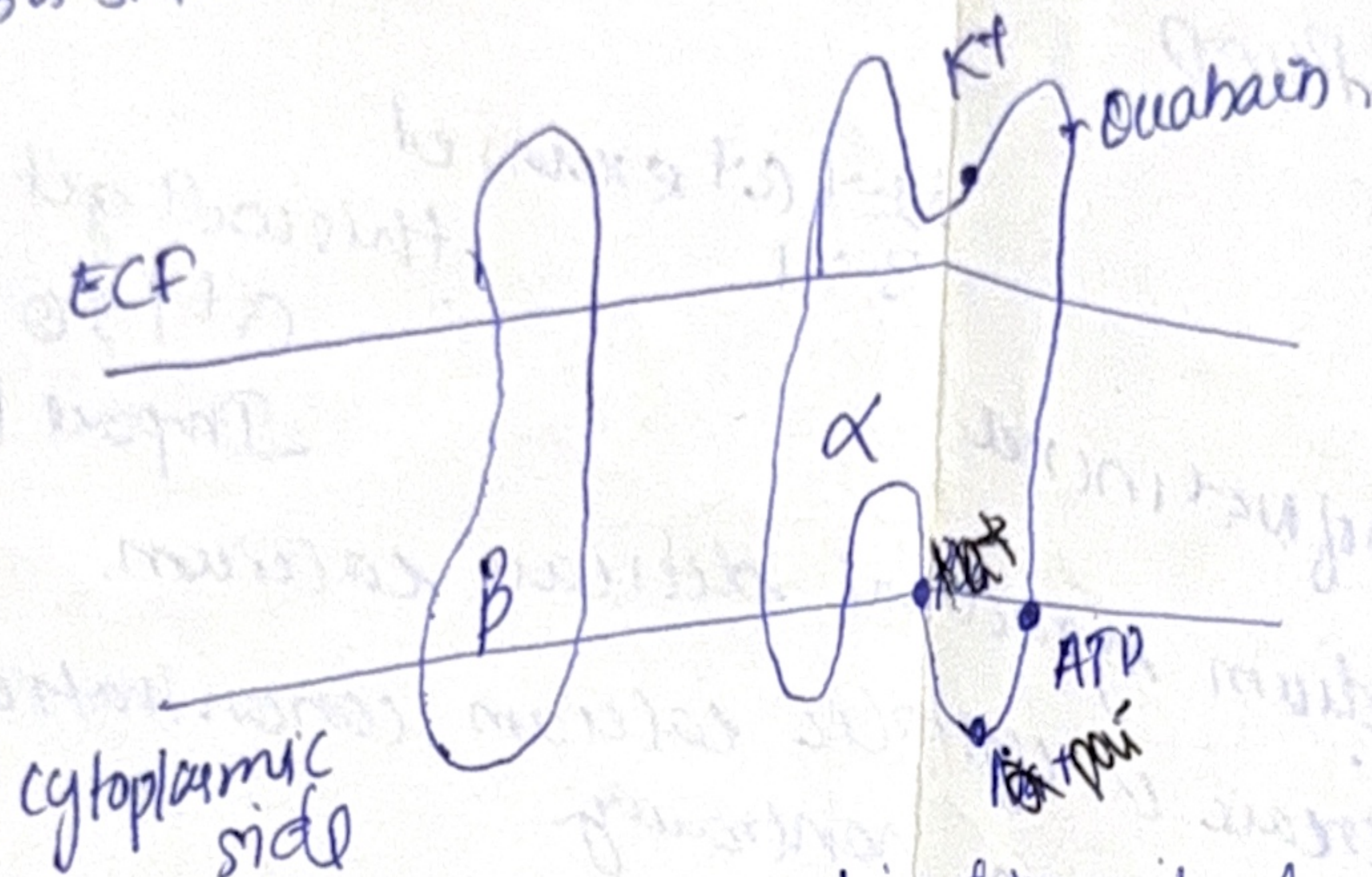


$\text{Na}^+ - \text{K}^+$ ATPase:

It is present in all eukaryotic cells. This is an antiporter that pumps K^+ into the cell and Na^+ out of the cell against their concentration gradient. This Antiporter transport system is primarily responsible for maintaining the high K^+ and low Na^+ conc.

⇒ It is a heterodimeric protein consisting of two subunits α and β .
 α is large - 109,000
 β is smaller - 55,000.



⇒ α subunit has ATPase activity, binding site for 3Na^+ , ATP and phosphate in cytoplasmic side.

⇒ Extracellular side has binding site for 2K^+ and ouabain.

⇒ On Activation, they pump 3Na^+ and 2K^+ into the cell.

⇒ It hydrolyzes ATP → ADP and uses energy to pump 3Na^+ out of the cell and 2K^+ into the cell for each mole of ATP hydrolyzed.

∴ It is an electrogenic pump.

Imp of electrogenic pump: creates the electrical potential across the membrane which is the basic requirement for nerve and muscle fibers for transmitting electrical signals.

Functions:

- ① Cytolysis con → It maintains the high conc of K^+ and low conc of Na^+ in the cell.
- ② Cell volume: It regulates water movement across the cell membrane. It maintains intracellular water content and ∴ the cell volume. Failure of pump can lead to cell swelling and Rupture.