

Active Transport-1

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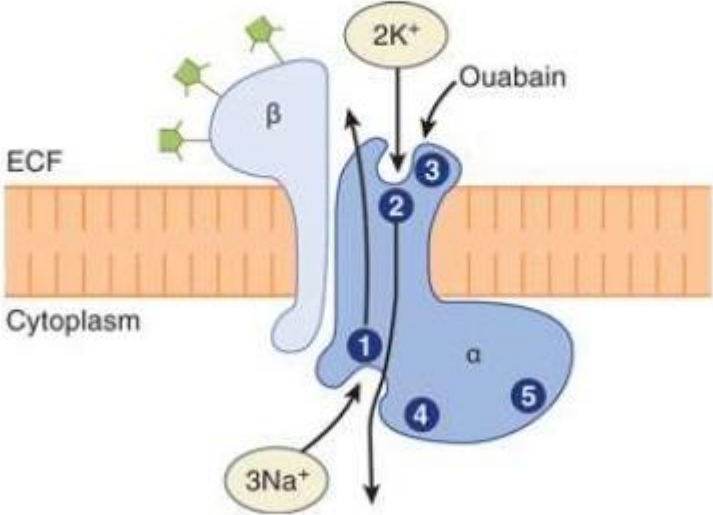
Active Transport

- Active transport is divided into two types according to the source of the energy used to cause the transport:
 - 1. Primary active transport
 - 2. Secondary active transport.

Primary active transport

- They use the energy directly from the hydrolysis of ATP.
 - Sodium potassium Pump
 - Calcium pump
 - Hydrogen Potassium pump
 - Hydrogen / Proton pump

Sodium potassium pump



Sodium potassium pump

- present in all eukaryotic cells

Functions:

1. Maintains sodium potassium concentration difference across the cell membrane.
2. Maintains volume of the cell.
3. Causes negative electrical charge inside the cell – electrogenic pump
4. Essential for oxygen utilization by the kidneys

Calcium pump

- Calcium ions are normally maintained at extremely low concentration in the intracellular cytosol of virtually all cells in the body, at a concentration about 10,000 times less than that in the extracellular fluid.
- This is achieved mainly by two primary active transport calcium pumps.
- One is in the cell membrane and pumps calcium to the outside of the cell.
- The other pumps calcium ions into one or more of the intracellular vesicular organelles of the cell, such as the sarcoplasmic reticulum of muscle cells and the mitochondria in all cells.

Hydrogen Potassium pump

H⁺-K⁺ ATPase

- Gastric glands - parietal cells - hydrochloric acid secretion – pumps hydrogen ions into the gastric lumen in exchange for potassium
- Renal tubules - intercalated cells in the late distal tubules and cortical collecting ducts – secretion of hydrogen ions & reabsorption of potassium ions.

Proton pump

H⁺ ATPase

- Present in lysosome and endoplasmic reticulum
- Pumps proton from cytosol into these organelles.