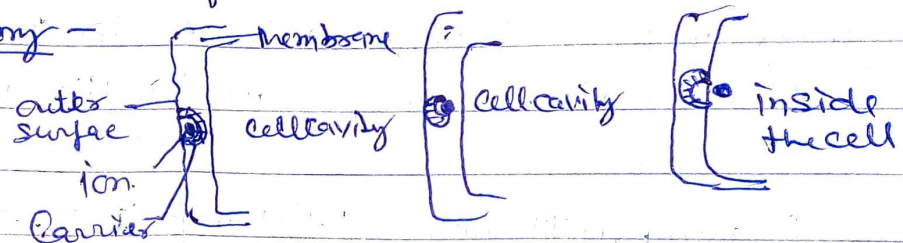


## Active Absorption —

The absorption and accumulation of salts or their ions within the plant cells against the concentration gradient, Against the law of diffusion is characteristic feature of active absorption.

The absorption of minerals with involvement of energy <sup>derived</sup> ~~obtained~~ from metabolic processes of plant. In active absorption molecule or ions cross a protoplasmic membrane from its lower to higher concentration.

### The carrier concept theory —



The total volume of cell ~~set~~ can be divided into three parts.

- outer free surface - which includes the space which allow free diffusion of ions.
- inner surface - it is the space in which ions penetrate with the aid of metabolic energy.
- intermediate space - This is the middle of cytoplasm which is impermeable to free ions.

According to carrier concept theory some carrier molecules get as carrier ions. This molecule combines with ion in outer free space and forms carrier-ion complex. This moves into inner space where it release ions. The carrier compounds return back to outer space to pick up fresh ions.

anion (-)  
cation (+)

several theories of mineral absorption have been given from time to time based on carrier concept.

(Lundegardh 1933) A cytochrome pump theory may act as anion carriers. The transport of anion is mediated through cytochrome oxidase system. The transport of cation is a passive process.

According to carrier mechanism involving ATP the lecithin (phospholipid) acts as a carrier which enables ions to move inside through cell membrane otherwise it is impermeable to ions.

Electro-chemical gradient hypothesis - According to this hypothesis (Mitchell 1968). The anions are transported by

the generation of an electro-chemical gradient across the membrane. The enzyme ATPase play an important role in the process. It hydrolyses ATP to ADP + Pi, splitting water to H<sup>+</sup> and OH<sup>-</sup>. The membranes are oriented in such a manner that H<sup>+</sup> are excreted outside while OH<sup>-</sup> are transported to the inner side of the membrane. Because of this a proton gradient is generated in the membrane. Ion transport is occur if an anion is exchanged for a OH<sup>-</sup>. Cations may be transported through carrier mediated active uptake and the carrier may be ATPase itself.

