## Co-transport and absorption of glucose in the ileum

#### Increasing the rate of movement across membranes

Epithelial cells contain microvilli which provide increased surface area for the insertion of carrier proteins through which diffusion, facilitated diffusion and active transport can take place. Another mechanism to increase the rate of movement is by increasing the number of protein channels and carrier proteins in any given area of membrane.

## The role of diffusion in absorption

Diffusion is the net movement of molecules or ions from a region of high conc to one of low conc.

As carbohydrates and proteins are being digested constantly, there is a larger concentration of glucose and AA within the ileum than the blood. Therefore the substances move down the gradient by facilitated diffusion from in the ileum into the blood. Due to a constant blood flow, the glucose absorbed into it is constantly being removed by the cells as they use it up during respiration helping maintain the conc gradient increasing the rate of movement.

#### Role of active transport in absorption

As diffusion causes equilibrium in and out of the ileum active transport is required to transfer the rest of the glucose and AA in the ileum into the blood. This an example of co-transport as the substances are drawn into the cells along with sodium ions that have been actively transported out by the Na-K pump.

Process: sodium ions are transported out of the epithelial cells, by the surprise the blood. This takes place in one type of protein molecule found in the orl Correce membrane of the epithelial cells meaning a larger conc gradient of Na ions. The ions window into the epithelial cells down the concentration gradient through a different type of carrier protein. As the sodium ions diffuse in through this second carrier notein, they carry either anine acid molecules or glucose molecules into the cell with them. The glucose/AA was and the blood plasma by facilitated diffusion using a different type or carrier.

The sodium ion provides the power for the movement of glucose against the conc gradient. Inherit form of active transport.

# Questions

- 1. As glucose provides energy as it is a substrate released by respiration and it causes the uptake of sodium ions from the intestine.
- 2. The sodium ions replace ones lost from the body and they also increase the use of glucose carrier proteins to absorb more sodium ions.
- 3. To kill any bacterial pathogens.
- 4. Potassium ions lost in the body are replaced and they stimulate an appetite from the person.
- 5. Banana tastes good and is easily digested.
- 6. As water potential measures the conc of solute and therefor a lot of glucose will lower the water potential compared to epithelial cells causing water to move out by osmosis making the person more dehydrated.
- 7. Starch is large and insoluble.
- 8. Break it down using enzymes into smaller molecules to make it less viscous.
- 9. As different species and organisms have different characteristics and may react differently.
- 10. As a control so it can be used a comparison for those who actually took the drug.