

4.5 Co-Transport and Absorption of Glucose In the Ileum

Increasing the Rate of Movement Across Membranes

- Epithelial cells lining the ileum possess microvilli
- Microvilli = finger like projections of the cell surface membrane about 0,6 um in length and collectively called the brush border as under a microscope they look like bristles on a brush
- Microvilli provide more SA for insertion of carrier proteins through which diffusion, facilitated diffusion and active transport take place
- Also increase number of protein channels and carrier proteins

Role of Diffusion in Absorption

- As carbohydrates and proteins are being digested continuously there is normally great concentration of glucose and amino acids within the ileum than the blood
- Therefore there is a concentration gradient down which glucose moves via facilitated diffusion from inside the ileum to the blood
- Blood is constantly being circulated by the heart the glucose absorbed into it is continuously being removed but the cells as they use it up during respiration helping to maintain the concentration gradient between the inside of the ileum and the blood
- This means that the rate of movement by facilitated diffusion across epithelia cell surface membranes is increased

Role of Active Transport in Absorption

- Glucose and amino acids are absorbed by active transport into the blood
- Glucose and amino acids are absorbed from the small intestine = co-transport as they are drawn into cells along with sodium ions that have been actively transported out by the sodium potassium pump

Sodium Potassium Pump

1. Sodium ions are actively transported out of epithelia cells by the sodium potassium pump into the blood. This takes place via carrier molecules found in the cell surface membrane of epithelial cells
 2. This maintains a much higher concentration of sodium ions in the lumen of the intestine than inside the epithelial cells
 3. Sodium ions diffuse into the epithelial cells down this concentration gradient through a co transport protein. As the sodium ion diffuse through the second carrier protein it carries either an amino acids or glucose molecule into the cell with them
 4. glucose/amino acids pass into the blood plasma by facilitated diffusion using another type of carrier protein
- Sodium, amino acids and glucose move into the cells
 - Sodium ions move down the concentration gradient