

Edexcel (B) Biology A-level

4.2 - Cell transport mechanisms

Flashcards

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Why do cells have a membrane?



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- To regulate movement of substances in and out of the cell.
- To protect the organelles inside.



What is meant by the fluid mosaic model?



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Cell membranes are formed of a phospholipid bilayer, described as fluid. It also contains many proteins e.g. transport, receptors, enzymes. This is described as a mosaic.



Define passive transport and give three examples of this.



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The movement of particles down a concentration gradient (high to low), meaning no energy is required. Diffusion, facilitated diffusion, and osmosis are all passive.



Define diffusion and name factors that affect its rate.



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The movement of particles from an area of high concentration to an area of low concentration. Affected by surface area, temperature, concentration, membrane thickness.



Define facilitated diffusion and give the type of substances that use this.



Define facilitated diffusion and give the type of substances that use this.

The movement of particles from high to low concentration through a carrier protein or channel protein. Used by charged substances (e.g. Na^+ , glucose) because the cell membrane repels them.



Define osmosis.



Define osmosis.

The movement of free water molecules from an area of high concentration to an area of low concentration, across a partially permeable membrane.



Define water potential.



Define water potential.

The tendency of water to move by osmosis. Pure distilled water has the highest water potential of 0. Osmosis occurs from high water potential to low.



How can water potential be calculated?



How can water potential be calculated?

Turgor pressure = inward pressure exerted by the cell wall, osmotic potential = the ability of water to move across a PP membrane.

Water potential = turgor pressure + osmotic potential.



How might certain properties of a molecule affect how it's transported?



How might certain properties of a molecule affect how it's transported?

- Solubility= lipid-soluble molecules pass through membranes more easily.
- Size= smaller molecules diffuse faster.
- Charge= charged molecules cannot diffuse by simple diffusion.



Explain the process involved in moving large molecules across a cell membrane.



Explain the process involved in moving large molecules across a cell membrane.

Requires vesicles. Endocytosis= cell extensions (pilli) engulf material to form a vesicle, which enters the cytoplasm.

Exocytosis= vesicle fuses with cell membrane to release contents from cell.



Define active transport.



Define active transport.

The movement of molecules against a concentration gradient (low to high), meaning energy is required. Also uses carrier proteins.



Explain the role of ATP in active transport.



Explain the role of ATP in active transport.

ATP binds to the carrier protein, providing enough energy for the protein to change shape, which carries the molecule in or out of the cell.



How does ATP release energy?



How does ATP release energy?

When ADP is phosphorylated to form ATP, this requires energy which is then stored in the molecule. Therefore when ATP is hydrolysed, the energy is released to be used where required.

