Simple vs Facilitated Diffusion

Small non-polar molecules diffuse through the bilayer; ions need channel or carrier proteins, still passively.



Key terms

simple diffusion	net movement down a concentration gradient directly through the phospholipid bilayer; for small, non-polar molecules.
facilitated diffusion	passive movement down a gradient through channel or carrier proteins; no ATP.
channel protein	a protein with a pore that lets specific ions through.
carrier protein	a protein that changes shape to move a specific molecule across.
polar / charged	does not dissolve in the hydrophobic tails, so cannot cross the bilayer directly.
rate of diffusion	faster with greater surface area, more channel or carrier proteins and a steeper concentration gradient.

I can...

- [ ] Simple diffusion and limitations imposed by phospholipid bilayer
- [ ] Facilitated diffusion via carrier proteins and channel proteins
- [ ] Factors affecting rate: surface area, number of channel or carrier proteins and gradient of concentration

EXAM TRAP

Ions are not blocked because they are "too big": they are charged, so cannot pass the hydrophobic tails. Facilitated diffusion is passive, down the gradient, no ATP.

4 marks: what earns them

1. Oxygen is small and non-polar / lipid-soluble, so it dissolves in / passes between the phospholipids (hydrophobic tails)
   Not: oxygen is small, alone; oxygen is polar
2. Sodium ions are charged / polar, so cannot pass through the hydrophobic core / tails of the bilayer
   Not: ions are too big; ions are blocked with no reason
3. Ions pass through channel proteins or carrier proteins, down the concentration gradient, without ATP (passive)
   Not: ions use ATP; ions go against the gradient
4. Increase the number of channel proteins or carrier proteins in the membrane (so more routes for ions)
   Not: make the membrane thinner; increase ATP

Remember

Small and non-polar: straight through.
Charged: needs a protein.
Facilitated = passive, no ATP.

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