

Osmosis (3) Osmosis and Aquaporins

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Osmosis & Aquaporins

Learning Outcomes...

1) UNDERSTAND that channel Proteins, AQUAPORINS facilitated the 'Movement' of H_2O across cell Membranes...

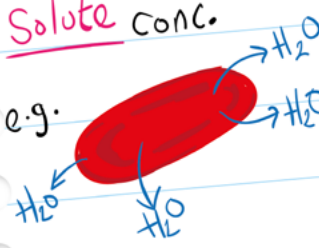


REMEMBER "The NET MOVEMENT of H_2O Molecules across a Partially-Permeable Membrane"
→ H_2O moves from a region of HIGH H_2O conc. (Low solute conc.) to LOW H_2O conc. (High solute conc.)

→ Until H_2O conc. on both 'sides' is EQUAL

REMEMBER...

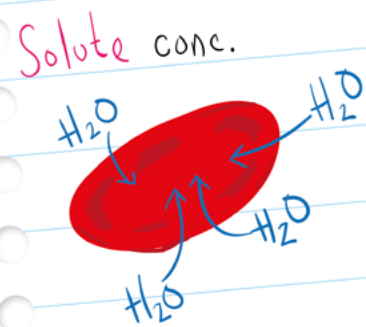
HYPERTONIC → there is a Higher Solute conc.
So, H_2O Moves OUT of the Cell!



i.e. ISOTONIC
→ NO NET MOVEMENT of H_2O INTO OR OUT of Cells / Solution.

However...

HYPOTONIC → there is a Lower Solute conc.

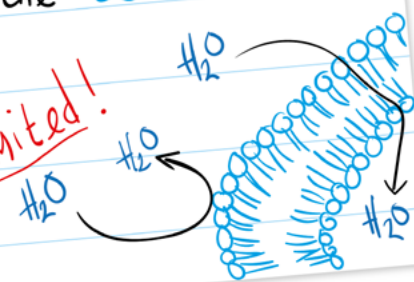


So, H_2O moves INTO the Cell!

So, Transport across the cell Membrane is quite Complex...

Despite H_2O being a Polar molecule, it CAN cross the cell MEMBRANE...

...But! Movement is Limited!



So! H_2O flow across the Membrane is FACILITATED!!

REMEMBER! Solute conc. e.g. IONS (Na^+ , K^+ , Cl^- ... etc.) → AFFECT π_w of cells...

∴ Affecting the NET Movement of H_2O across the cell Membrane!

However, Special Proteins called AQUAPORINS facilitate the Movement of H_2O ... IN the Direction

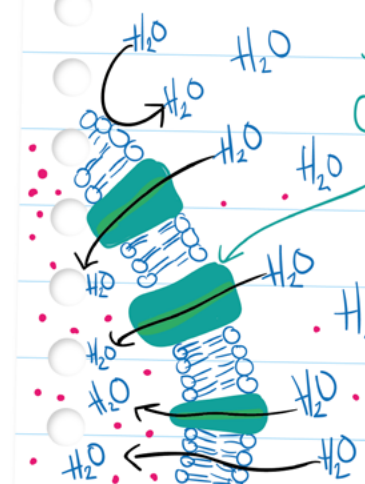
Dictated by ION conc. (Solute conc.)

* in fact a genetic Condition known as NDI (nephrogenic DIABETES INSIPIDUS) is due to non-functional

e.g. in the kidney Some cells have lots of AQUAPORINS which allow the cells to Reabsorb more H_2O

AQUAPORINS! which leads to a failure to Reabsorb H_2O and ∴ the Excretion of LARGE Vol. of Dilute URINE!

So, Aquaporins are Channel Proteins that increase the Rate of OSMOSIS!



useful to know in year 2!



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