

: **NET MOVEMENT of WATER from a DILUTE Solution to a more CONCENTRATED one across the PARTIALLY PERMEABLE MEMBRANE**

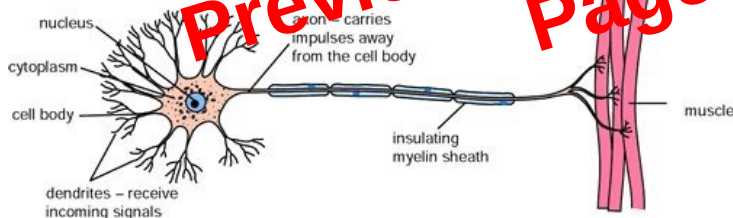
- Moves from a HIGHER Concentration of Water Molecules to a LOWER Concentration of Water Molecules
- : Still obeys laws of diffusion
- Especially important in PLANTS (e.g. in Plant Roots)

ACTIVE TRANSPORT

- When a cell **takes in a substance** even if there is only a **LITTLE AMOUNT outside of the cell**
- : It goes **AGAINST the Concentration Gradient**
- It uses the energy from RESPIRATION to TAKE UP the particles
- : e.g. a pump using energy to take liquid from A to B
- "Pumps" = Protein Molecules in Cell Membrane
- Example: Human **SMALL INTESTINE**
- : Active Transport allows GLUCOSE (in gut) is ABSORBED into cells
- **ROOTS of Plants take up Mineral Ions** like this

CELL DIVISION AND DIFFERENTIATION

- **MULTICELLULAR ORGANISMS** (e.g. plants, animals) start off as a single fertilised egg cell
- : Fertilised Egg Cell = **ZYGOTE**
- The cell divides continuously (from 2 to 4 to 8 etc.), into the millions = **MITOSIS**
- Cell Division = Zygote >>> **EMBRYO**
- : Certain cells will become specialised for certain functions = **DIFFERENTIATION**
- Different cells develop **DEPENDANT** on where they are
- : e.g. **NERVE CELL** in the **SPINE**, or **EPIDERMAL CELL** on the (outer layer of the) **SKIN**
- **NERVE CELL** has **AXON** to carry nerve impulses
- SPERM CELL has a TAIL so it can swim to egg



NERVE CELL

SPERM CELL



CELLS, TISSUES and ORGANS

Organelle >>> Cell >>> Tissue >>> Organ >>> Organ System >>> Organism

e.g. Nucleus >> Nerve Cell >>> Nervous Tissue >>> Brain >>> Central Nervous System >>> Human

- Cells with a **SIMILAR Function** that are grouped together = **TISSUE**
- : e.g. Muscle Tissue, Blood Tissue
- Many Tissue with a **SIMILAR Function** that are grouped together = **ORGAN**
- Different Organs working together = **ORGAN SYSTEM**
- : e.g. Digestive System, Respiratory System, Circulatory System, Excretory System