

Osmosis



Diffusion of water through a semi-permeable membrane

- Semi-permeable: permeable to solvents (WATER), but not to large molecules
- High [water] to low [water]



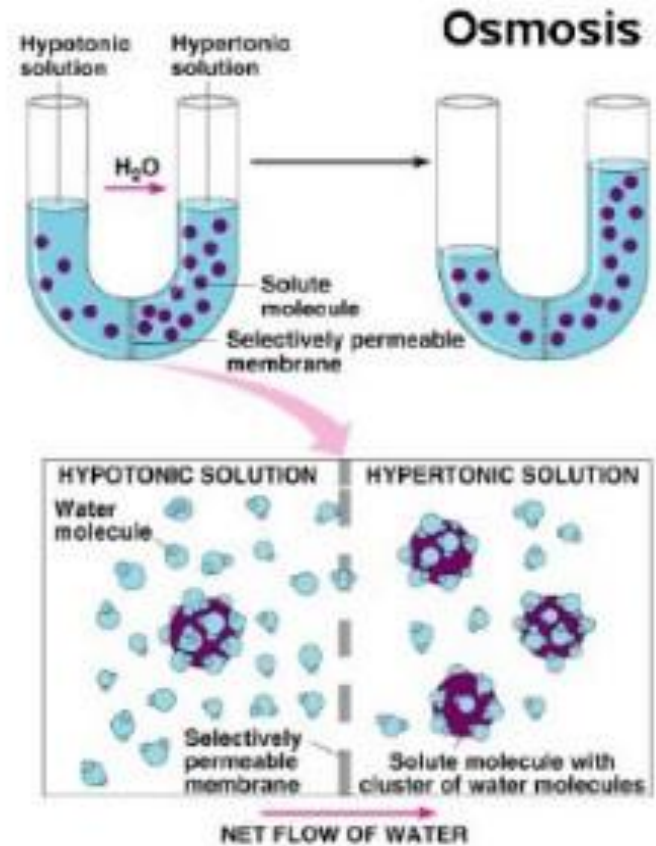
Dissolved molecules (i.e. glucose, starch) are called solutes



REMEMBER:

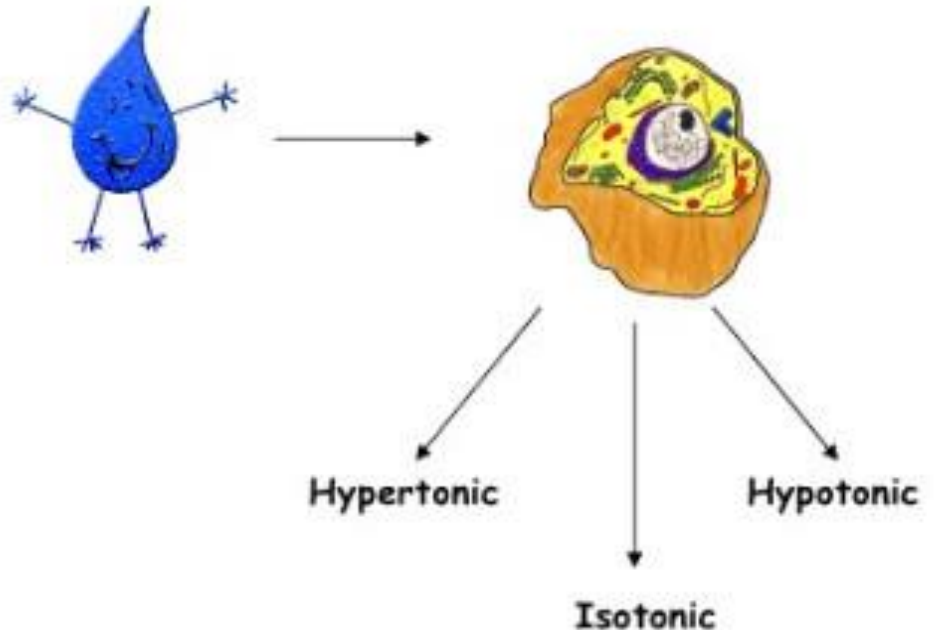
Water = solvent

Glucose, Starch = solutes

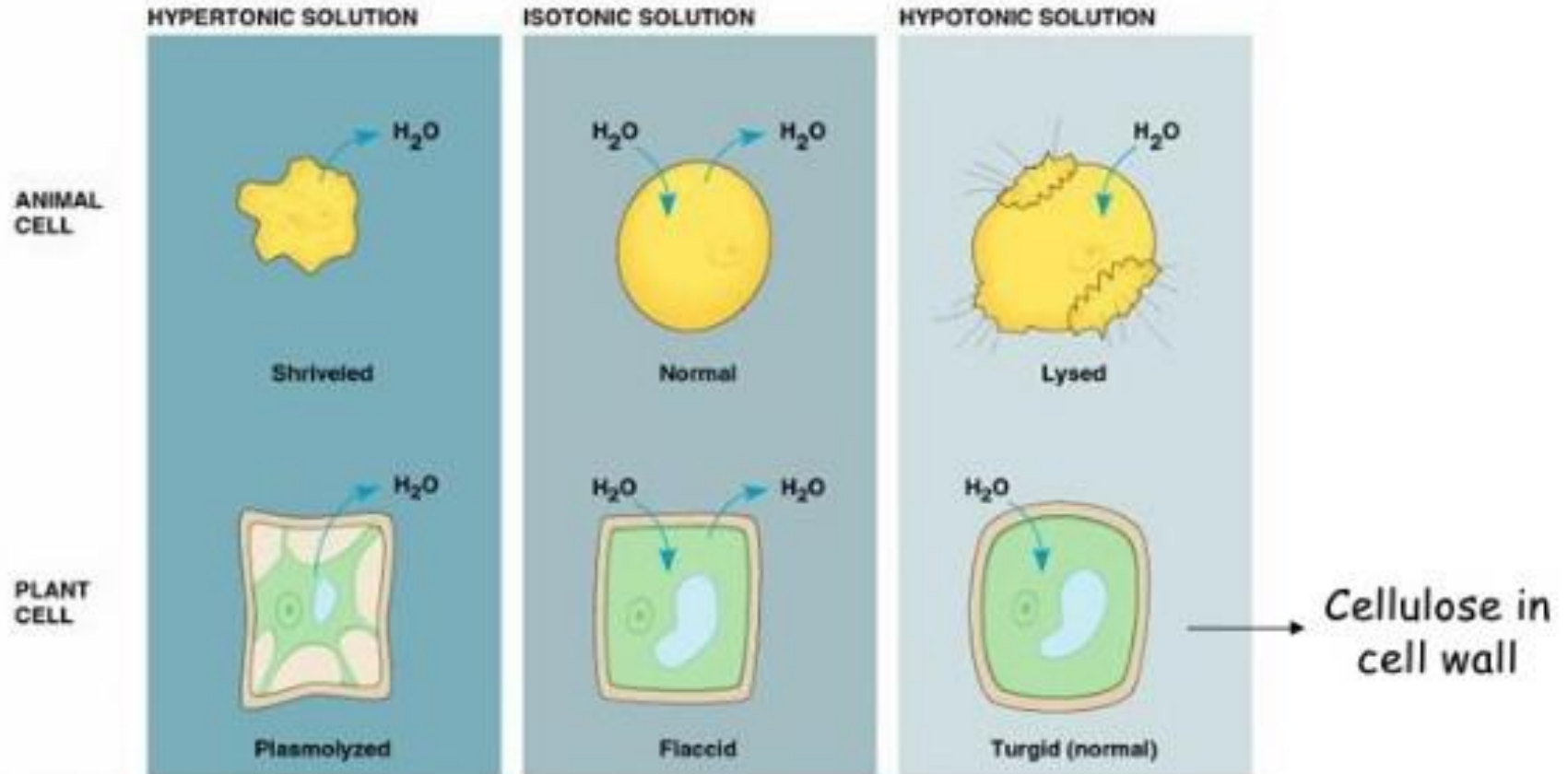


Effect of Water on Cells

- Hypertonic Environment
 - High [solute], low [water]
- Hypotonic Environment
 - High [water], low [solute]
- Isotonic Environment
 - [water] = [solute]



Osmosis in Living Cells



Osmosis in Red Blood Cells

- Observe sheep RBCs via a wet mount of the sample
- Aliquot one drop the following solutions with a $\frac{1}{2}$ drop of RBC to a slide

✓0.9% saline

✓10% NaCl

✓Distilled water

Predictions?

- Record observation in the table on page 85



Isotonic



Hypertonic



Hypotonic

Animations

Dialysis Bag Experiment

- <http://ccollege.hccs.cc.tx.us/instru/Biology/AllStudyF>

Elodea Cell

- <http://ccollege.hccs.cc.tx.us/instru/Biology/AllStudyF>

Osmosis

- <http://ull.chemistry.uakron.edu/genobc/animations/osmosis.mov>

Transportation of Molecules

- Passive Transport

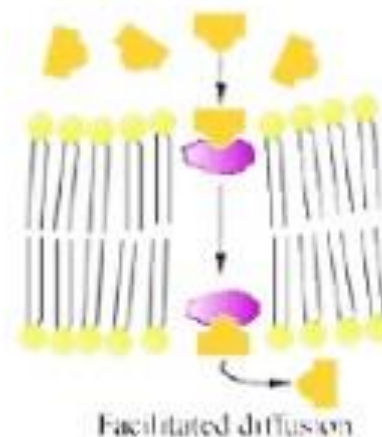
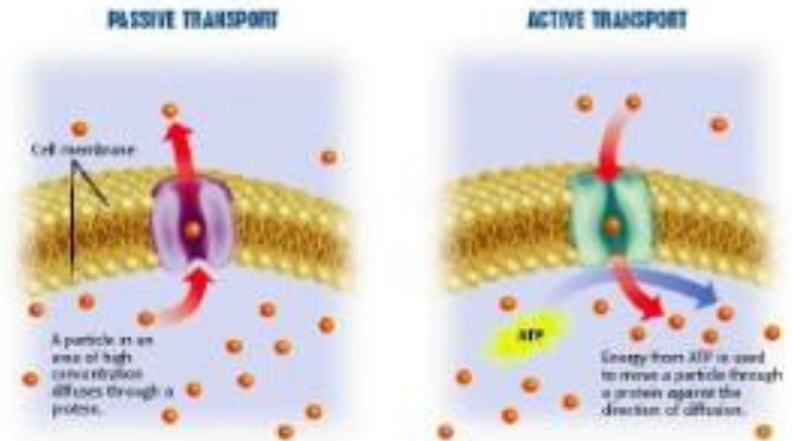
- Movement of molecules across a semi-permeable membrane
- no energy required

- Active Transport

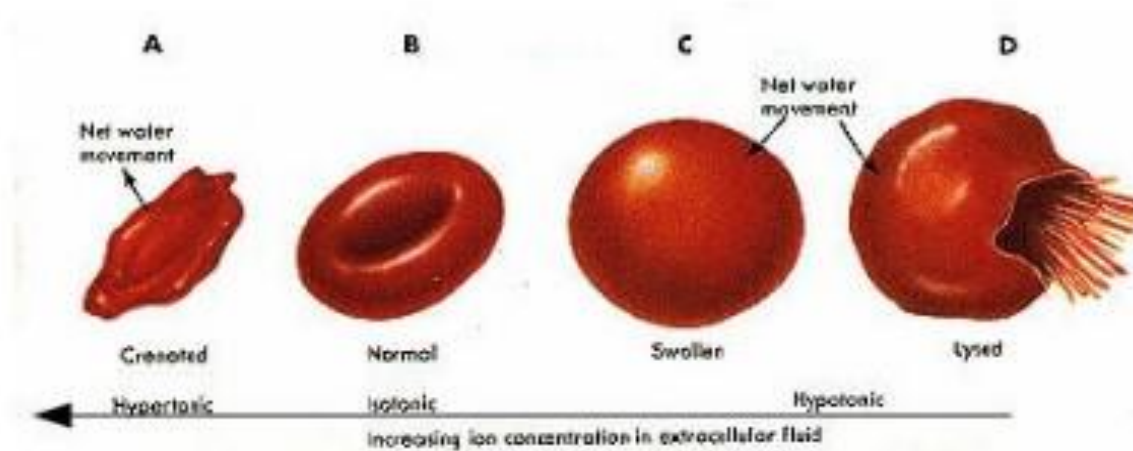
- Movement of molecules across a semi-permeable membrane against a concentration gradient with a protein
- ENERGY - ATP

- Facilitated Diffusion

- Movement of molecules across a semi-permeable membrane with a protein
- no energy required

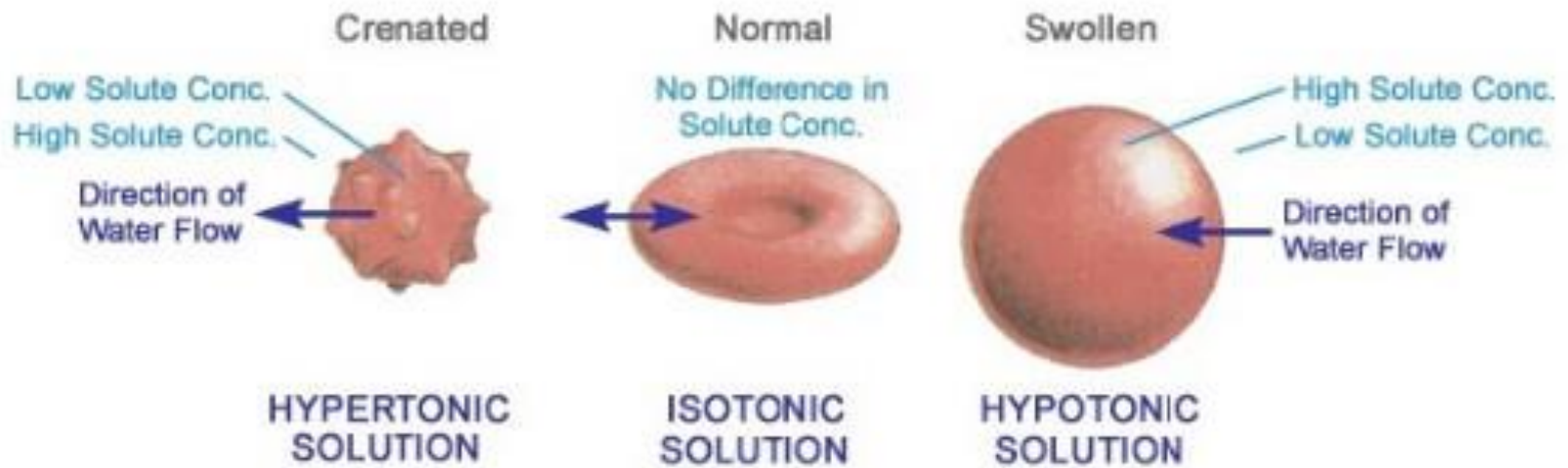


Effect of Water on RBC



From: Altans, S. Biology.
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Tonicity Effects on the Red Blood Cell



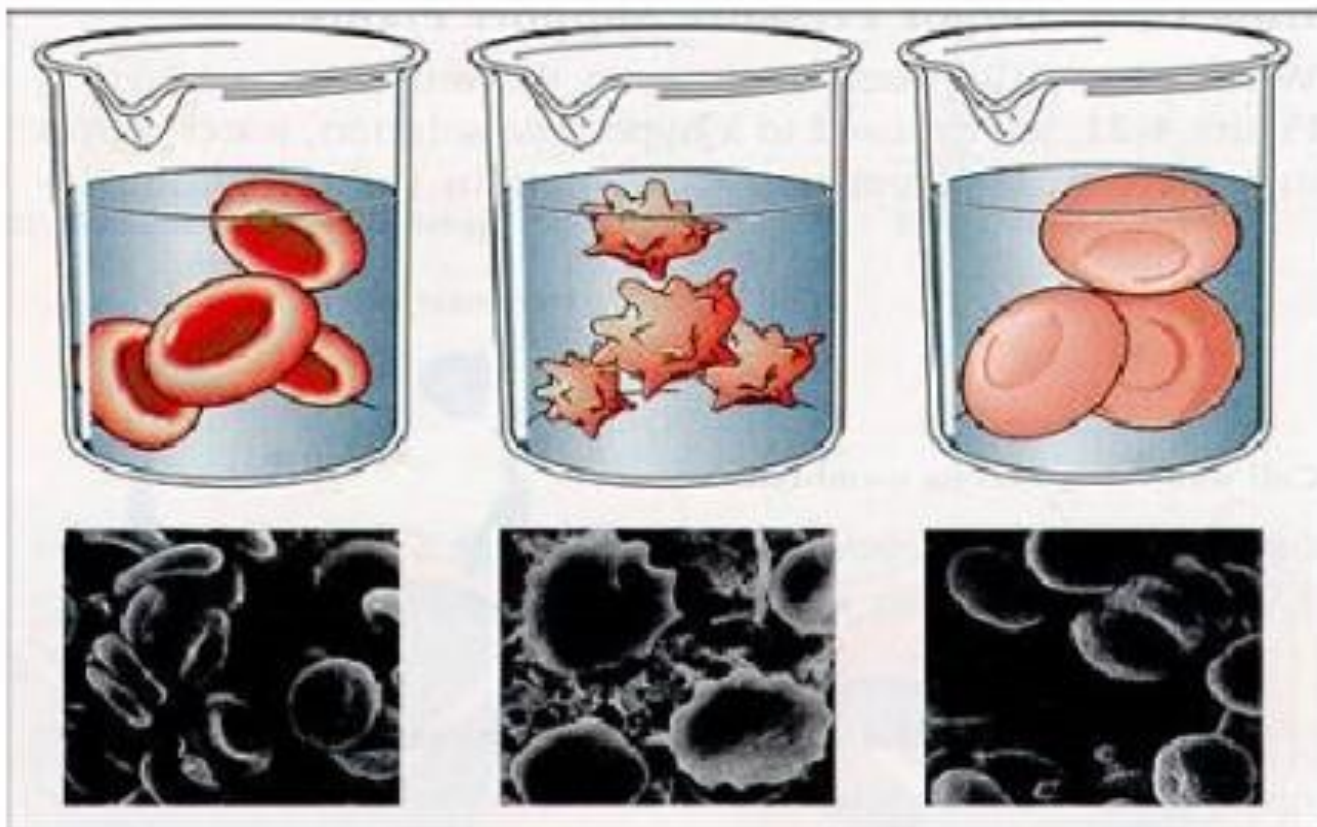




TABLE 5-1 *Direction of Osmosis*

Condition	Net movement of water	
External solution is hypotonic to cytosol	into the cell	
External solution is hypertonic to cytosol	out of the cell	
External solution is isotonic to cytosol	none	