

# **Topic 2 slides**

## **Ask Weber**

**Weber Liu**

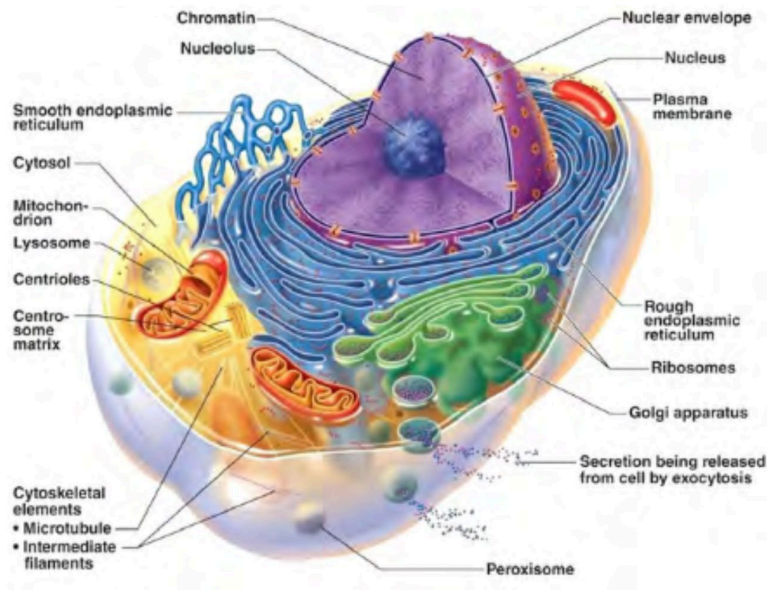
## Topic 2

### Cell structure



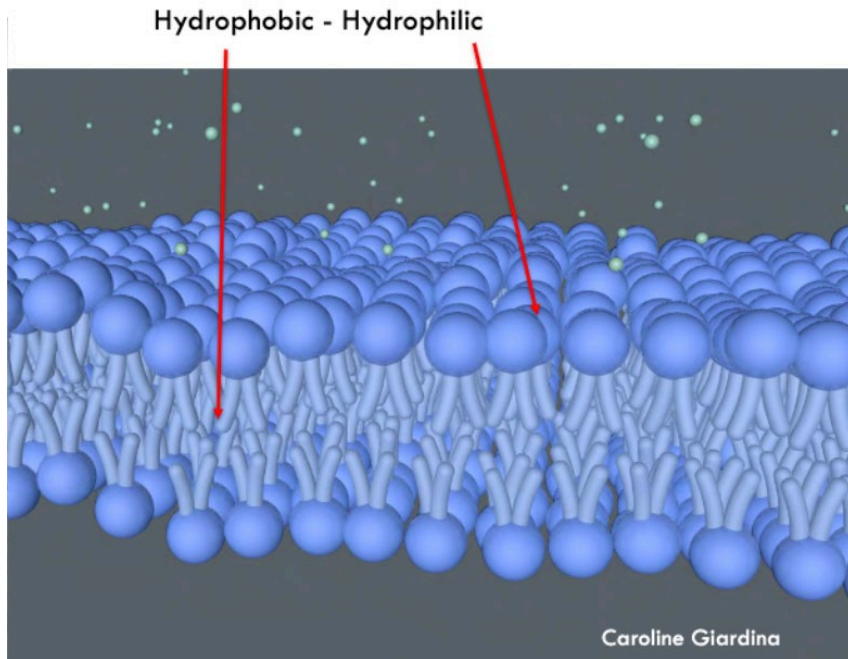
THE UNIVERSITY OF  
SYDNEY

## Lecture 2 – Cell components



1. What is the function of the RER?
2. What is the function of the SER?
3. What is the order in which DNA is converted into proteins?
4. What cell component/organelle is involved in the destruction of waste
5. Is the cell to the left a eukaryotic or prokaryotic cell?

## Lecture 2 – Cell components



1. In a phospholipid bilayer, is the hydrophobic layer in the inside (sandwiched in the middle) or the outside (doing the sandwiching)?
2. What substances are the lipid bilayer NOT permeable to?

## Lecture 2 - Tonicity



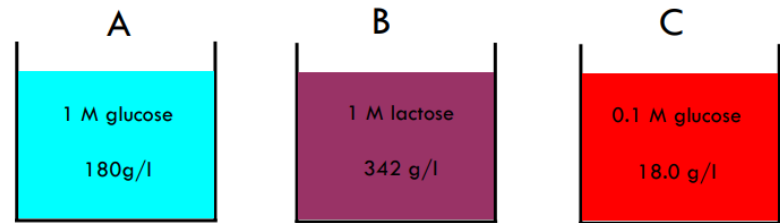
1. In the image to the left, red blood cells have been placed in a solution. Is the solution hypertonic, isotonic or hypotonic compared to the red blood cells?
2. Define hypertonic, isotonic and hypotonic

## Explain the process of osmosis

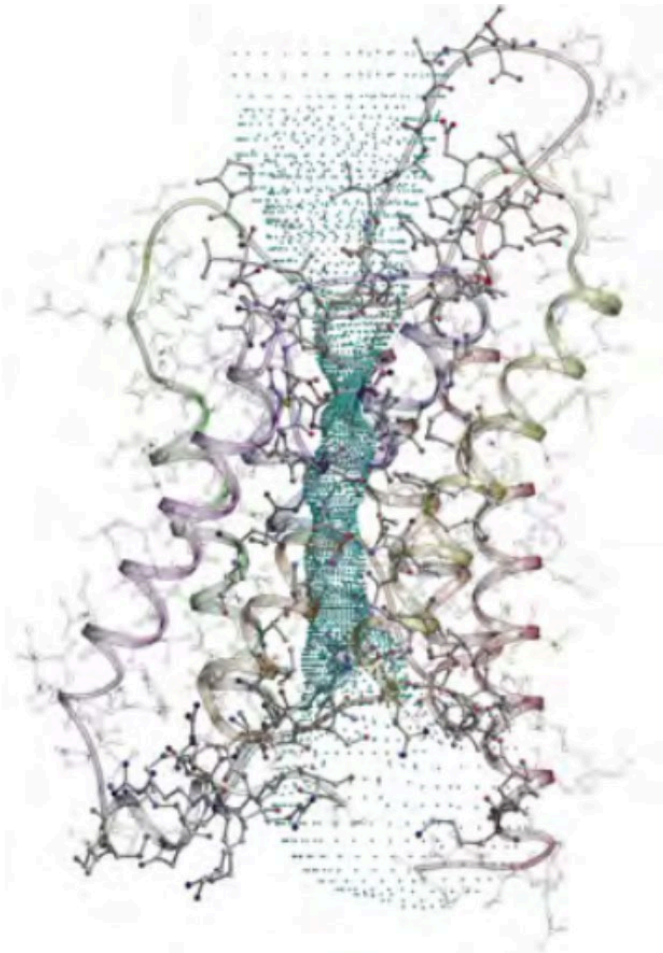
1. Explain osmosis
2. A semipermeable membrane is placed between

1. A and B
2. B and C
3. A and C

**Explain which direction osmosis would occur**

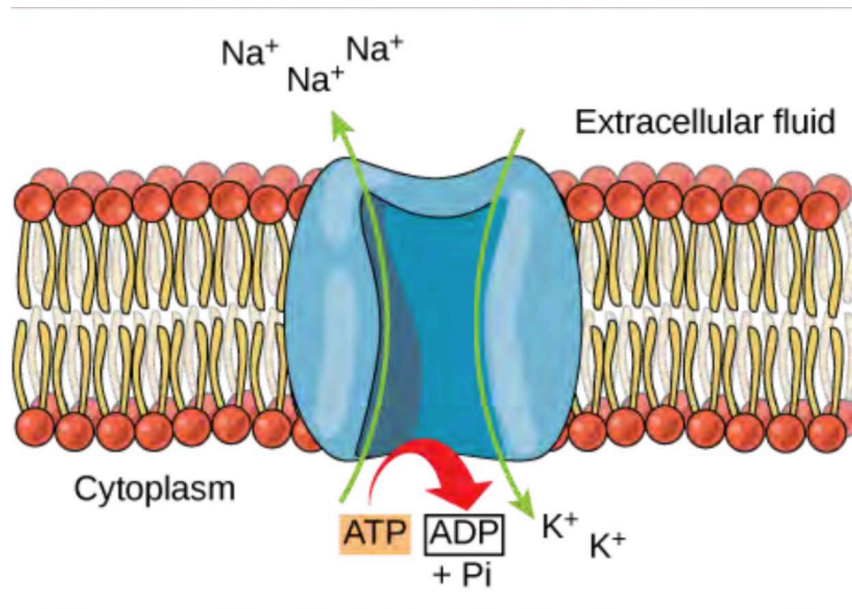


## Lecture 2 – ion movement



1. In the disorder known as SIADH (Syndrome of Inappropriate ADH), a hormone (ADH) is released in excess. At the kidney, ADH plays a role in upregulating AQP2 (Aquaporin). This process tends to concentrate the urine. Describe in as much detail as possible what you know about Aquaporin.
2. Is Aquaporin an example of facilitated diffusion or active transport?

## Lecture 2 - NKA

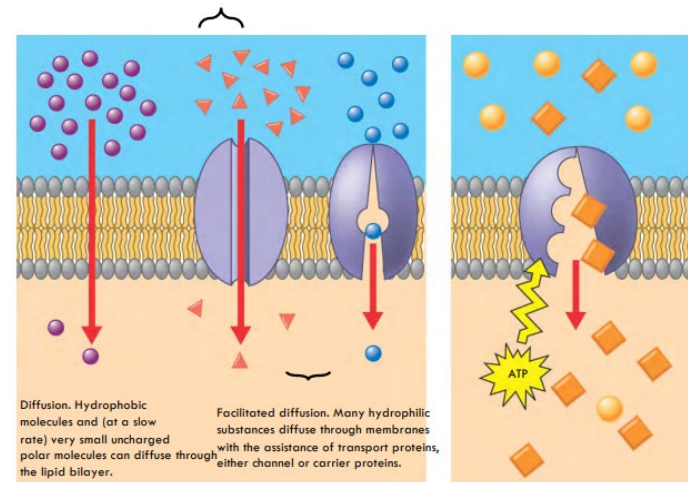


1. In most cells, a membrane potential is maintained at the basolateral surface typically by a Na<sup>+</sup>-K<sup>+</sup>-ATPase. This will pump 3 Na<sup>+</sup> ions out of the cell and 2 K<sup>+</sup> ions into the cell, whilst using up an ATP molecule. Is this an example of active or passive transport?
2. Explain how this transporter results in a positive/negative membrane potential for the cell



## Active vs passive transport

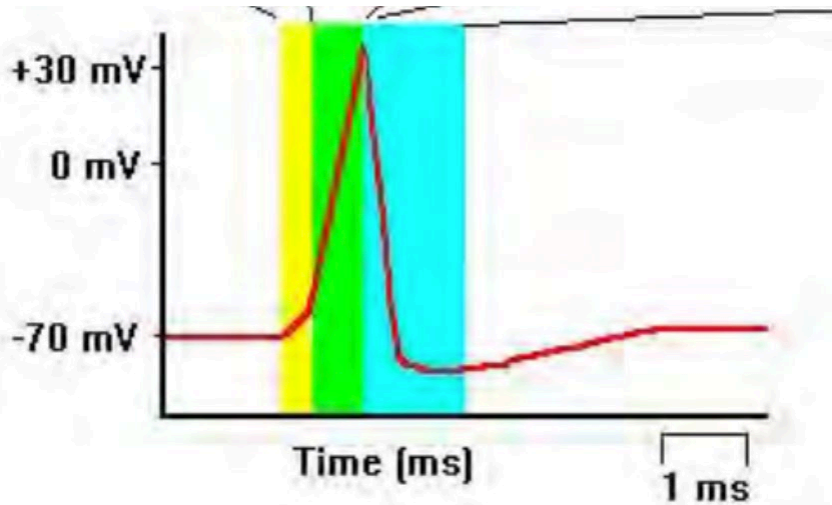
**Both active transport and facilitated diffusion require ion channels. Explain their differences**



Passive = DOWN a concentration gradient

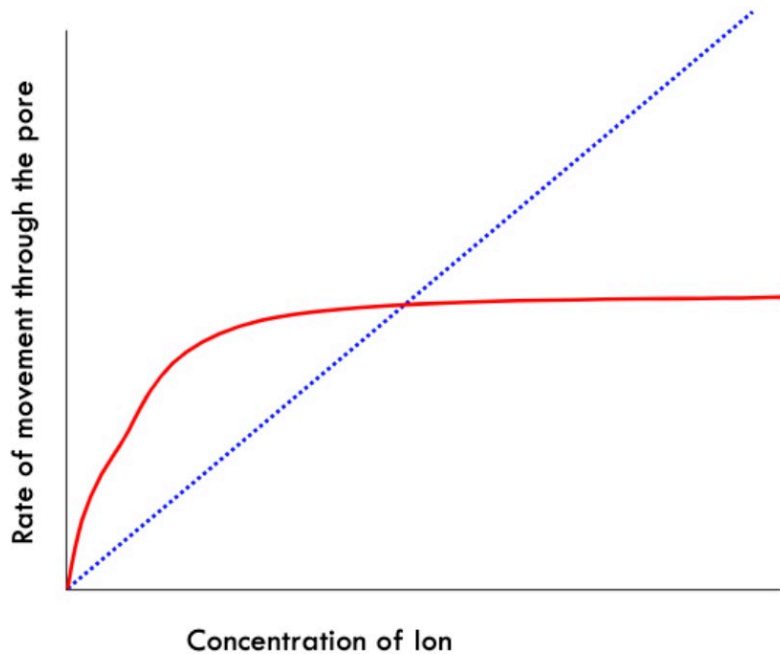
Active = AGAINST a concentration gradient

## Lecture 2 – Action potential



1. In the following AP diagram, explain
  1. What channel(s) open in the yellow
  2. What channel(s) close in the yellow
  3. What channel(s) open and close in the green
  4. What channel(s) open and close in the blue
2. What component within the cell membrane insures a higher  $\text{Na}^+$  concentration intracellularly?

## Lecture 2 – graph interpretation



**Interpret the figure to the left (note the blue dotted line is just a diagonal line indicating this scale is linear).**