**AP Bio Water Potential Practice Questions**

Check your answers against your teacher’s key.

Be sure to use your formula sheet when working these problems.

1. If a cell’s ΨP = 3 bars and its ΨS = -4.5 bars, what is the resulting Ψ?
2. The cell from question #1 is placed in a beaker of sugar water with ΨS = -1.2 bars.
   1. Find the Ψ of the solution
   2. Draw a picture (label Ψ of cell and surrounding solution, indicate flow of water, indicate what happens to the cell).
   3. Is the solution hypertonic, hypotonic, or isotonic to the cell?
3. The original cell from question # 1 is placed in a beaker of sugar water with ΨS = -0.15 MPa (megapascals). We know that 1 MPa = 10 bars.
   1. Find the Ψ of the solution
   2. Draw a picture (label Ψ of cell and surrounding solution, indicate flow of water, indicate what happens to the cell).
   3. Is the solution hypertonic, hypotonic, or isotonic to the cell?
4. The value for Ψ in root tissue was found to be -3.3 bars.
   1. If you take the root tissue and place it in a 0.1 M solution of sucrose at 20°C in an open beaker, what is the Ψ of the solution
   2. Draw a picture (label Ψ of cell and surrounding solution, indicate flow of water, indicate what happens to the cell).
   3. Is the solution hypertonic, hypotonic, or isotonic to the cell?
5. NaCl dissociates into 2 particles in water: Na+ and Cl-.
   1. If the solution in question 4 contained 0.1M NaCl instead of 0.1M sucrose, what is the Ψ of the solution?
   2. Draw a picture (label Ψ of cell and surrounding solution, indicate flow of water, indicate what happens to the cell).
   3. Is the solution hypertonic, hypotonic, or isotonic to the cell?
6. At 20°C, a cell containing 0.6M glucose is in equilibrium with its surrounding solution containing 0.5M glucose in an open container.
   1. What is the cell’s Ψ and the solution’s Ψ?
   2. Draw a picture (label Ψ of cell and surrounding solution, indicate the flow of water, indicate what happens to the cell).