**Cell Structure and Function Lab Report**

Student name

Institution

Course name and unit code

Professor

Due name

# Pre-laboratory Questions-answer in the space provided

1. What does it mean for a substance to move down its concentration gradient? When does a substance stop moving down its concentration gradient? Provide an

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| When two distinct solutions with different concentrations are separated by a membrane, a concentration gradient is formed between the solutions. In order for a chemical to stop flowing down its concentration gradient, lower concentration regions and higher concentration portions must combine Concentration gradient may be in the body compared to the exchange of oxygen and carbon dioxide that takes place during respiration as an example of this process. The lungs and the circulatory system are both involved in the diffusion of oxygen. After being absorbed into the tissues and circulated, carbon dioxide is released from the body when we exhale. |

1. What does it mean to say that a membrane is selectively permeable? Explain how the plasma membrane of the cell is selectively permeable.

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| A membrane that is selectively permeable implies that it permits certain molecules or ions to flow through while blocking the passage of others. Selective permeability is a term used to describe the ability to filter molecular movement in this way. In order to keep particles from floating past the membranes, contains a phospholipid bilayer structure that acts like a door, allowing only the correct substances to pass through. |

1. How is osmosis similar to simple diffusion? How is osmosis different from simple diffusion?

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| The processes of osmosis and simple diffusion are both used to balance the concentration of two liquids. Simple diffusion and osmosis are both passive transport processes, which implies that they do not need any additional energy to be applied in order to take place. Moreover, diffusion and osmosis are comparable in that they are measures that permit the passage of specific particles and charges across the particular penetrable cell layer.  In simple diffusion, the migration of particles occurs in the same direction as the gradient in the concentration of the solution. In assisted diffusion, the movement of molecules may occur in both directions - in the direction of the concentration gradient and in the opposite direction of the gradient. |

# Observations

# Activity 1 Simple Diffusion

**Data Table 1**

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| **Time (min)** | **Diameter, Potassium Permanganate (mm)** | **Diameter, Methylene Blue (mm)** |
| *0* | 1mm | 1mm |
| *15* | 1.5 mm | 1.4mm |
| *30* | 1.7 mm diameter | 1.5 mm diameter |
| *45* | 1.8 mm diameter | 1.6 mm diameter |
| *60* | 2.0 mm diameter | 1.8 mm diameter |

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| Insert the photos of the Petri dish from Activity 1, with appropriate labels and figure captions. |

# Activity 2 Osmosis

**Data Table 2**

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| --- | --- | --- | --- |
|  | **Treatment A** | **Treatment B** | **Treatment C** |
| **Solution in dialysis tubing** | *20% sucrose* | *40% sucrose* | *20% sucrose* |
| **Solution in cup** | *20% sucrose* | *20% sucrose* | *40% sucrose* |
| **Initial volume**  **(Vi) (mL)** | 87ml | 89ml | 86ml |
| **Final volume**  **(Vf) (mL)** | 87ml | 91ml | 85ml |
| **Change in**  **volume**  **(Vf−Vi) (mL)** | Vf-Vi  87mL - 87mL =  0mL    No change | Vf-Vi  91mL - 89mL =  2mL  change | Vf-Vi  85mL – 87mL =  -2mL  change |
| **Percent change**  **in volume**  **(change in volume/Vi) ×100** | 0/87 \* 100 = 0% | 2/89 \* 100 = 2.30% | -2/87 \* 100 = -2.30% |
| **Hypotonic, isotonic,**  **or hypertonic** | Isotonic | hypotonic | Hypertonic |

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| Insert the photos of the pieces of dialysis tubing from Activity 2 before and after treatment, with appropriate labels and figure captions. |

# Discussion Questions: Answer in the space provided.

1. The molecular weight of potassium permanganate is 158 g/mol. The molecular weight of methylene blue is 320 g/mol. Based on the information recorded in Data Table 1, what can you conclude about the relationship between molecular weight and diffusion?

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| The weight of potassium is less than the weight of the methylene blue and the blue spread slower than the permanganate did. I would say the heavy the molecular weight the slower the diffusion process is. The lighter the weight of a molecule the quicker it speeds the process of diffusion up. |

1. In Data Table 2, what is the significance of a negative percent change in volume?

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| If the significance was expressed as a negative percentage, it would indicate that the outcome was the polar opposite of osmosis. There was a drop in volume, which resulted in it being hypertonic. |

1. What would you predict if a person tried to stay hydrated by drinking seawater?

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| If someone attempted to keep hydrated by drinking salt water, I would expect them to become much more dehydrated than they were before they started. Because seawater is saltier than what our bodies can process via our urine, it would need more water to wash out our system in order to restore it to its normal hydration level. |

1. Aquaporins are membrane proteins. Based on what you have learned of their function, are aquaporins peripheral or integral membrane proteins?

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| Aquaporins are membrane proteins that are essential for cell survival. They function as a conduit for the transportation of water (solute) through the membrane. This is a natural byproduct of the osmosis process. |