Cell Transport Quiz Questions and Answers PDF

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Which of the following is a type of passive transport?

- ◯ Endocytosis
- ◯ **Diffusion ✓**
- ◯ Exocytosis
- ◯ Active transport

> Passive transport is a biological process that allows substances to cross membranes without the need for energy input. Examples include diffusion and osmosis, which are fundamental mechanisms for moving molecules across cell membranes.

Explain how the sodium-potassium pump functions in active transport.

> **The sodium-potassium pump uses ATP to move sodium ions out of the cell and potassium ions into the cell against their concentration gradients, maintaining cellular homeostasis.**

Describe the process of osmosis and its importance to cell survival.

Osmosis is the diffusion of water across a selectively permeable membrane. It is crucial for maintaining cell turgor and nutrient balance.

How does temperature affect the rate of diffusion in cells?

Higher temperatures increase kinetic energy, thus speeding up the rate of diffusion, while lower temperatures slow it down.

What is the role of ATP in active transport, and why is it necessary?

ATP provides the energy required to move molecules against their concentration gradient in active transport, enabling vital cellular functions.

What roles do membrane proteins play in cell transport? (Select all that apply)

- [ ] Structural support
- [ ] **Active transport ✓**
- [ ] DNA replication
- [ ] **Facilitating diffusion ✓**

Membrane proteins are crucial for facilitating various types of cell transport, including passive transport through channels, active transport via pumps, and receptor-mediated transport. They help maintain cellular homeostasis by regulating the movement of ions, nutrients, and waste across the cell membrane.

Which factors affect the rate of diffusion? (Select all that apply)

- [ ] **Temperature ✓**
- [ ] **Surface area ✓**
- [ ] ATP availability
- [ ] **Concentration gradient ✓**

> The rate of diffusion is influenced by several factors including temperature, concentration gradient, surface area, and the size of the molecules involved.

Which processes are involved in endocytosis? (Select all that apply)

- [ ] **Phagocytosis ✓**
- [ ] Exocytosis
- [ ] **Receptor-mediated endocytosis ✓**
- [ ] **Pinocytosis ✓**

> Endocytosis involves several key processes including membrane invagination, vesicle formation, and the internalization of substances into the cell. These processes allow cells to uptake nutrients, signaling molecules, and other important materials from their environment.

Which component of the cell membrane is primarily responsible for its selective permeability?

- ◯ Carbohydrates
- ◯ Cholesterol
- ◯ Nucleic acids
- ◯ **Phospholipid bilayer ✓**

> The phospholipid bilayer of the cell membrane is primarily responsible for its selective permeability, allowing certain substances to pass while blocking others. This selective permeability is crucial for maintaining the internal environment of the cell.

Which of the following are types of passive transport? (Select all that apply)

- [ ] **Diffusion ✓**
- [ ] Active transport
- [ ] **Facilitated diffusion ✓**
- [ ] **Osmosis ✓**

> Passive transport includes processes that allow substances to move across cell membranes without the use of energy. Common types of passive transport are diffusion, facilitated diffusion, and osmosis.

What is the term for the engulfment of large particles by a cell?

- ◯ Pinocytosis
- ◯ Exocytosis
- ◯ Receptor-mediated endocytosis
- ◯ **Phagocytosis ✓**

> The process of engulfment of large particles by a cell is known as phagocytosis. This is a vital mechanism used by cells to remove debris and pathogens from the body.

Discuss the differences between facilitated diffusion and active transport.

> **Facilitated diffusion does not require energy and moves substances down their concentration gradient via transport proteins, while active transport requires energy to move substances against their gradient.**

Explain how receptor-mediated endocytosis differs from other forms of endocytosis.

> **Receptor-mediated endocytosis involves specific receptors binding to target molecules, allowing for selective uptake, unlike other forms that may not be as selective.**

Which of the following increases the rate of diffusion?

- ◯ Decreased temperature
- ◯ **Increased concentration gradient ✓**
- ◯ Decreased surface area
- ◯ Increased molecular size

> The rate of diffusion increases with higher temperatures, greater concentration gradients, and larger surface areas. Additionally, smaller molecules diffuse faster than larger ones.

What is the primary energy source used in active transport?

- ◯ Glucose
- ◯ NADH
- ◯ Oxygen
- ◯ **ATP ✓**

> Active transport primarily relies on ATP (adenosine triphosphate) as its energy source to move substances against their concentration gradient.

Which process involves the movement of water across a selectively permeable membrane?

- ◯ Facilitated diffusion
- ◯ Phagocytosis
- ◯ Exocytosis
- ◯ **Osmosis ✓**

> The process that involves the movement of water across a selectively permeable membrane is called osmosis. This process is essential for maintaining cellular homeostasis and involves the passive transport of water molecules from an area of lower solute concentration to an area of higher solute concentration.

Which of the following are characteristics of the phospholipid bilayer? (Select all that apply)

- ☐ **Hydrophilic heads ✓**
- ☐ Rigid structure
- ☐ **Selectively permeable ✓**
- ☐ **Hydrophobic tails ✓**

> The phospholipid bilayer is characterized by its amphipathic nature, fluidity, and selective permeability, allowing it to form a barrier that regulates the movement of substances in and out of the cell.

What type of protein assists in facilitated diffusion?

- ◯ Enzymatic proteins
- ◯ **Transport proteins ✓**
- ◯ Receptor proteins
- ◯ Structural proteins

> Facilitated diffusion is assisted by specific proteins known as transport proteins, which help move substances across cell membranes without the use of energy.

Which of the following processes requires energy input from the cell?

- ◯ Simple diffusion
- ◯ **Active transport ✓**
- ◯ Facilitated diffusion
- ◯ Osmosis

> Processes that require energy input from the cell include active transport, which moves substances against their concentration gradient, and cellular respiration, which generates ATP. These processes contrast with passive transport methods that do not require energy.

Which of the following processes involve vesicles? (Select all that apply)

- ☐ **Exocytosis ✓**
- ☐ Facilitated diffusion
- ☐ Simple diffusion
- ☐ **Endocytosis ✓**

> Vesicles are involved in various cellular processes such as endocytosis, exocytosis, and transport of materials within the cell. These processes utilize vesicles to move substances across membranes and facilitate communication between different cellular compartments.