

Cell Membrane And Transport Worksheet Answer Key PDF

Cell Membrane And Transport Worksheet Answer Key PDF

Disclaimer: The cell membrane and transport worksheet answer key pdf was generated with the help of StudyBlaze AI. Please be aware that AI can make mistakes. Please consult your teacher if you're unsure about your solution or think there might have been a mistake. Or reach out directly to the StudyBlaze team at max@studyblaze.io.

Part 1: Foundational Knowledge

What is the primary structural component of the cell membrane?

undefined. A) Proteins

undefined. B) Carbohydrates

undefined. C) Phospholipids ✓

undefined. D) Nucleic acids

The primary structural component of the cell membrane is phospholipids.

Which of the following are functions of membrane proteins? (Select all that apply)

undefined. A) Energy storage

undefined. B) Transport of molecules ✓

undefined. C) Signal transduction ✓

undefined. D) DNA replication

Membrane proteins are involved in transport, signaling, and other functions.

Explain the role of cholesterol in the cell membrane.

Cholesterol helps to stabilize the membrane's fluidity and structure.

List two types of passive transport mechanisms and briefly describe each.

1. 1. Diffusion

The movement of molecules from an area of higher concentration to an area of lower concentration.

2. 2. Osmosis

The diffusion of water across a selectively permeable membrane.

Examples include diffusion and osmosis, both of which do not require energy.

Which part of the phospholipid bilayer is hydrophobic?

undefined. A) The head

undefined. B) The tail ✓

undefined. C) Both head and tail

undefined. D) Neither head nor tail

The tail of the phospholipid bilayer is hydrophobic.

Part 2: Understanding Concepts

How does facilitated diffusion differ from simple diffusion?

undefined. A) It requires energy.

undefined. B) It moves substances against the concentration gradient.

undefined. C) It involves transport proteins. ✓

undefined. D) It only occurs in plant cells.

Facilitated diffusion involves transport proteins, while simple diffusion does not.

Which factors can affect the rate of diffusion across a cell membrane? (Select all that apply)

undefined. A) Temperature ✓

undefined. B) Membrane surface area ✓

undefined. C) Concentration gradient ✓

undefined. D) Presence of enzymes

Factors include temperature, membrane surface area, and concentration gradient.

Describe how the structure of the cell membrane contributes to its function as a selective barrier.

The phospholipid bilayer and embedded proteins create a selective barrier that regulates what enters and exits the cell.

Part 3: Applying Knowledge

A cell is placed in a hypertonic solution. What is likely to happen to the cell?

undefined. A) It will swell.

undefined. B) It will shrink. ✓

undefined. C) It will remain the same.

undefined. D) It will burst.

The cell will likely shrink due to water moving out of it.

In which scenarios would active transport be necessary? (Select all that apply)

undefined. A) Moving glucose into a cell where it is in higher concentration inside. ✓

undefined. B) Expelling sodium ions from a cell. ✓

undefined. C) Diffusion of oxygen into a cell.

undefined. D) Absorption of water by plant roots.

Active transport is necessary when moving substances against their concentration gradient.

Provide an example of a real-world application of cell membrane transport in medicine or technology.

Examples include drug delivery systems that utilize membrane transport mechanisms.

Part 4: Analyzing Relationships

Which of the following best explains why the cell membrane is described as a "fluid mosaic model"?

undefined. A) It is made of a single type of molecule.

undefined. B) Its components are rigid and immobile.

undefined. C) It is composed of various molecules that move freely. ✓

undefined. D) It is impermeable to all substances.

The fluid mosaic model describes the cell membrane as composed of various molecules that move freely.

Analyze the effects of temperature on membrane fluidity. Which statements are true? (Select all that apply)

undefined. **A) Higher temperatures increase fluidity. ✓**

undefined. **B) Lower temperatures decrease fluidity. ✓**

undefined. **C) Cholesterol prevents drastic changes in fluidity. ✓**

undefined. D) Membrane fluidity is unaffected by temperature.

Higher temperatures increase fluidity, while lower temperatures decrease it.

Discuss how the failure of membrane transport mechanisms can lead to disease. Provide an example.

Failure of transport mechanisms can lead to diseases such as cystic fibrosis, where chloride ion transport is disrupted.

Part 5: Synthesis and Reflection

Which strategy would be most effective in designing a drug that targets a specific membrane protein?

undefined. A) Increase the drug's size to prevent it from entering the cell.

undefined. **B) Modify the drug to mimic the protein's natural ligand. ✓**

undefined. C) Ensure the drug is hydrophobic to pass through the membrane easily.

undefined. D) Use a drug that binds to all proteins indiscriminately.

Modifying the drug to mimic the protein's natural ligand would be most effective.

Evaluate the potential consequences of a malfunction in sodium-potassium pump. Which outcomes are possible? (Select all that apply)

undefined. **A) Disruption of cellular ion balance ✓**

undefined. **B) Alter cell volume ✓**

undefined. C) Increased cellular energy efficiency

undefined. **D) Impaired nerve impulse transmission ✓**

Malfunction can lead to disruption of ion balance, altered cell volume, and impaired nerve impulse transmission.

Design an experiment to test the effects of a new drug on cell membrane permeability. Describe your approach and expected outcomes.

An experiment could involve measuring the uptake of a dye or substance in cells treated with the drug compared to control cells.