AP BIO INSTA-REVIEW

TOPIC 2.9

Mechanisms of Transport

ENE-2.J.1

A variety of processes allow for the movement of ions and other molecules across membranes, including passive and active transport, endocytosis and exocytosis.

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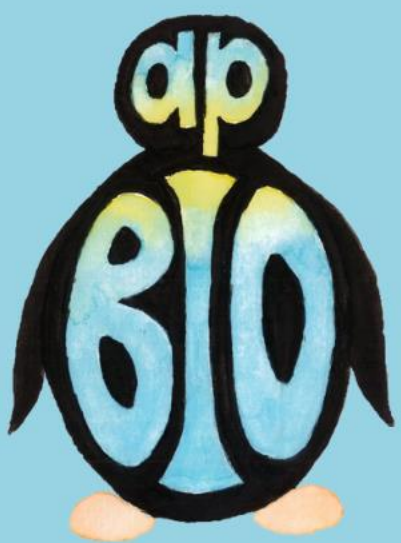

What moves the vesicles to the membrane for exocytosis?

A. Actin

B. Dynein

C. Kinase

D. Myosin

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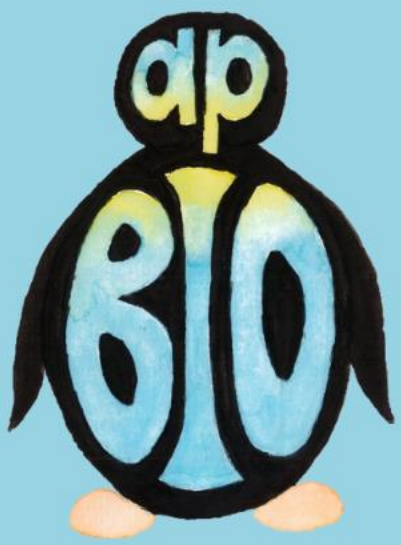

What moves the vesicles to the membrane for exocytosis?

B. Dynein

Dynein is the motor protein found in the cell. This will move along the microtubules to move the vesicles throughout the cell.

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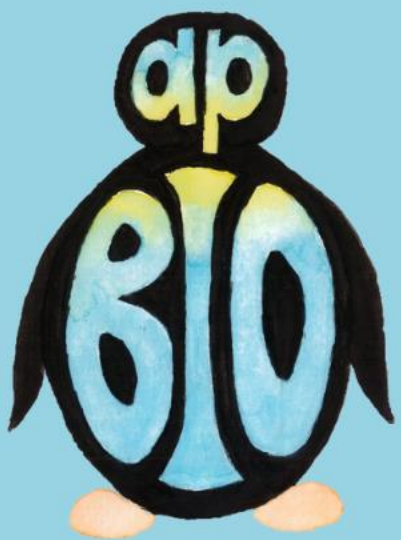

What provides the path for vesicles moving to membrane?

A. Intermediate filaments

B. Microfilaments

C. Microtubules

D. Cytosolic Proteins

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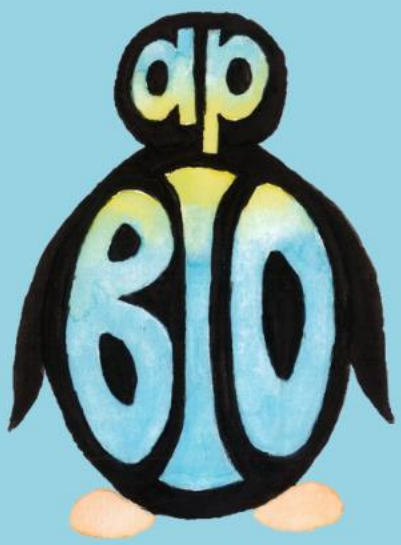

What provides the path for vesicles moving to membrane?

C. Microtubules

The microtubules act as "railway" within the cell. The dynein motor protein will move the vesicles along the microtubules throughout the cell.

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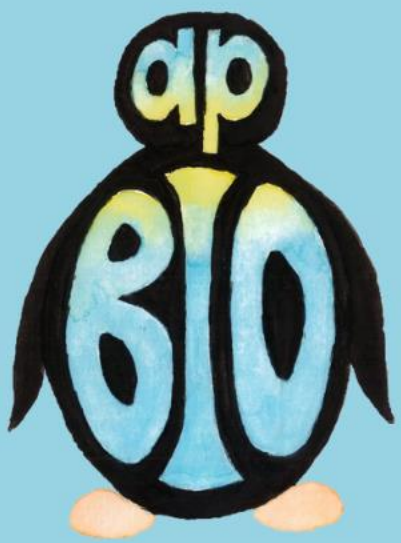

When you die, the calcium stored in the sarcoplasmic reticulum (smooth ER in muscle cells) releases the stored Ca^{2+} that is used for contraction. This released Ca^{2+} causes contraction of the muscles (rigor mortis).

Why does rigor mortis take place?

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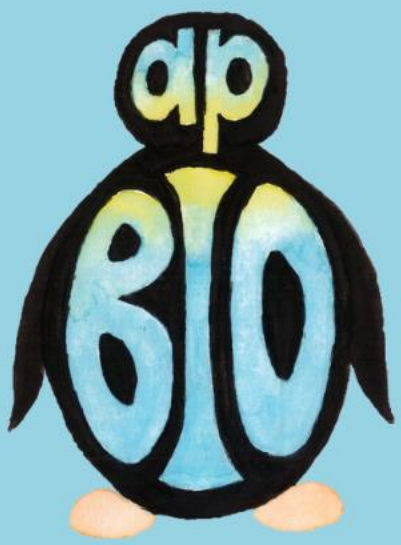
Why does rigor mortis take place?



There's no available ATP to pump the calcium ions back into the sarcoplasmic reticulum which is an active transport process requiring ATP.

P.S. The process of muscle contraction is not required content but it can be applied content if given the background info needed to answer the question.

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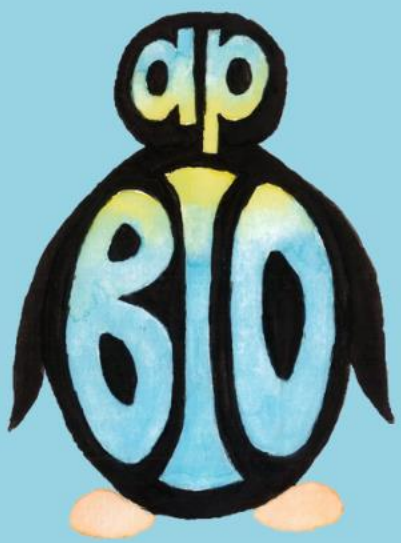

Blood in the gills of a fish undergoes countercurrent exchange with the surrounding aqueous environment. Countercurrent exchange involves two fluids moving in opposite directions and exchanging a substance. Why does blood flow in gills undergo countercurrent exchange?

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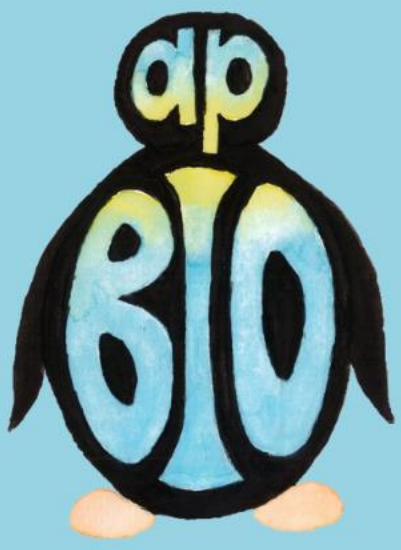

The surrounding water is always coming in contact with blood of lower oxygen concentration to increase efficiency of oxygen diffusion. Also, it increases the time of the two fluids in contract to allow for diffusion of the oxygen.

Oxygen is nonpolar and able to diffuse by simple diffusion (cross the membrane without the assistance of ATP or membrane protein)

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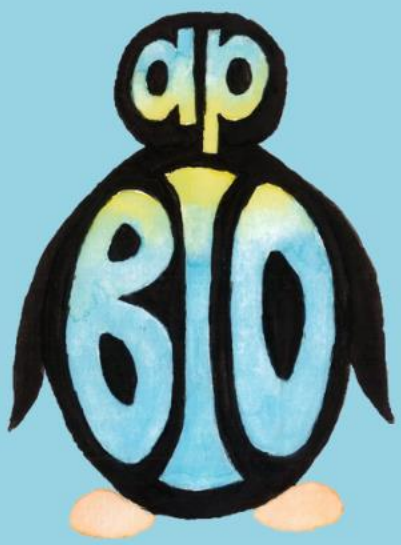

In carrier proteins, how is it specific for transport?

A. Active site binds to the solute

B. Allosteric site binds to the solute

C. Binding site opens channel

D. ATP provides needed energy

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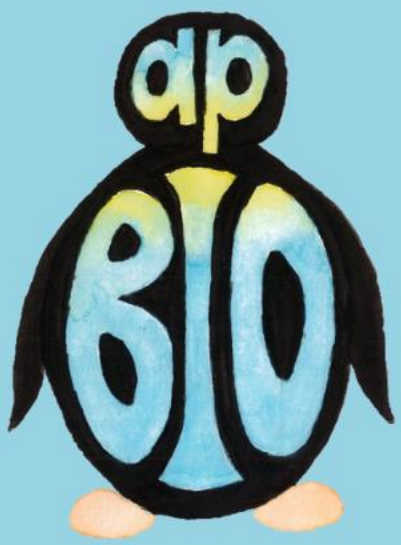

In carrier proteins, how is it specific for transport?

A. Active site binds to the solute

Transport proteins are specific to the material that they transport across the membrane (no matter if its the channel or carrier protein). The solute binds to the active site on the protein which allows for the passage of the material.

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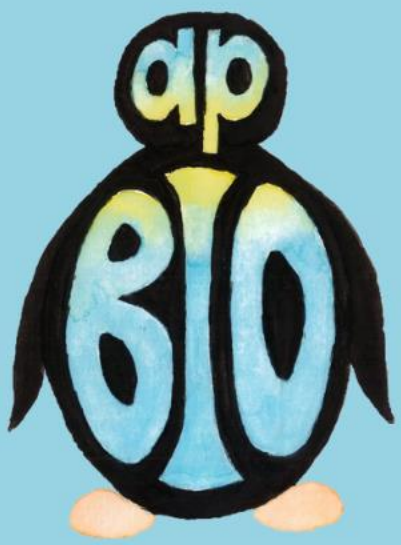

Passive transport

A. Does not require input of energy and moves against gradient

B. Does not require input of energy and moves with gradient

C. Requires input of energy and moves against gradient

D. Requires input of energy and moves with gradient

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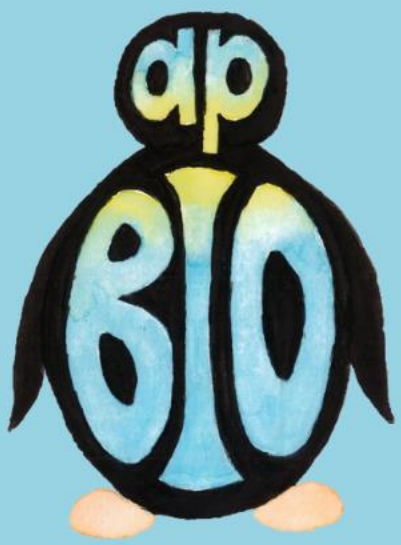

Passive transport

B. Does not require input of energy and moves with gradient

Passive by definition does not require any energy. It does not require an input of energy because the substance is moving with its concentration gradient. This means that it is moving from HIGH concentration to LOW concentration.

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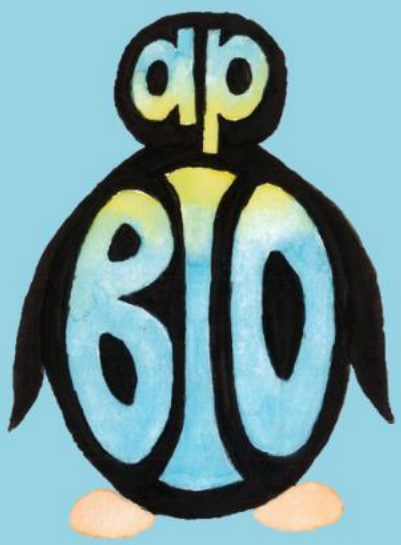

Active transport

A. Does not require input of energy and moves against gradient

B. Does not require input of energy and moves with gradient

C. Requires input of energy and moves against gradient

D. Requires input of energy and moves with gradient

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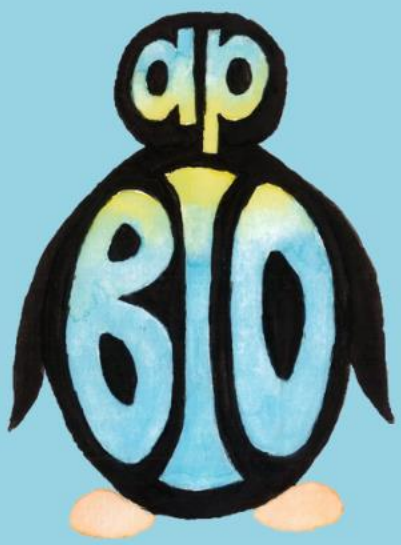

Active transport

C. Requires input of energy and moves against gradient

Active transport by definition means that it requires an input of energy. The input of energy is required due to the material moving against its concentration gradient which means it is moving from **LOW** concentration to **HIGH** concentration.

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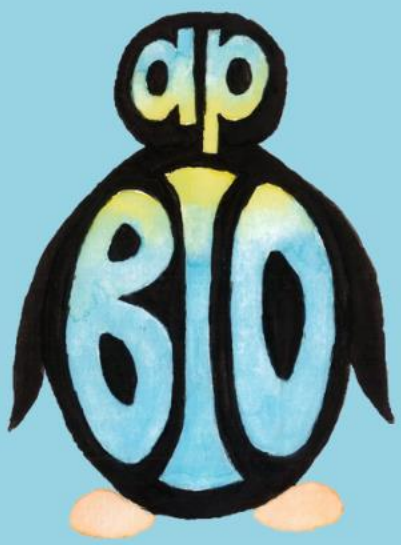

Facilitated diffusion

A. Does not use transport proteins and is a type of active transport

B. Does not use transport proteins and is a type of passive transport

C. Uses transport proteins and is a type of active transport

D. Uses transport proteins and is a type of passive transport

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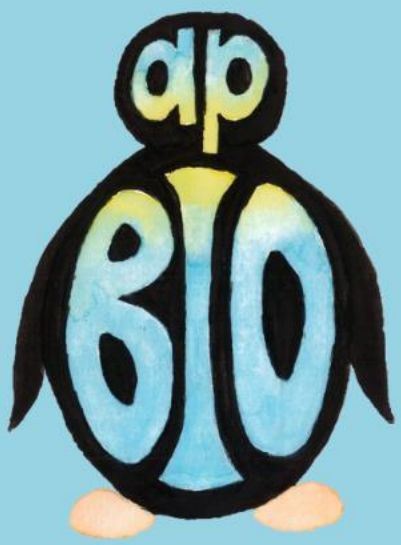

Facilitated diffusion

D. Uses transport proteins and is a type of passive transport

Facilitative diffusion is a type of passive transport so it does not require an input of energy as the material is moving down its concentration gradient (HIGH to LOW concentration). The material is polar or charged so it needs a transport protein.

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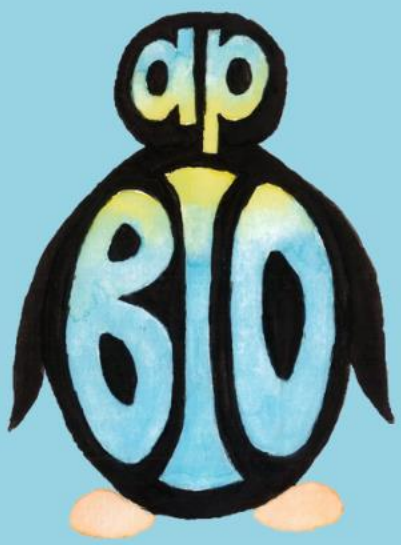

Endocytosis

A. Does not require ATP and allows large particles to enter the cell

B. Does not require ATP and allows large particles to leave the cell

C. Requires ATP and allows large particles to enter the cell

D. Requires ATP and allows large particles to leave the cell

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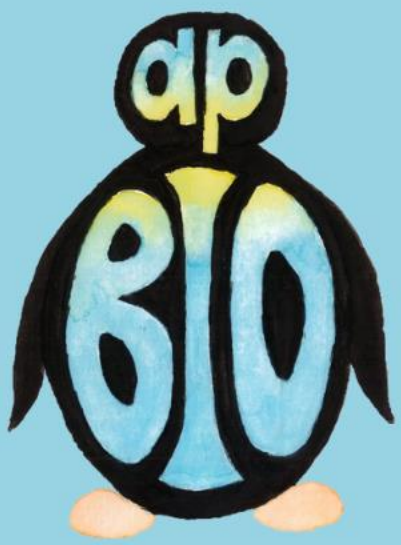
Endocytosis

C. Requires ATP and allows large particles to enter the cell



Endocytosis is a type of bulk transport. Due to the need to create a vesicle to surround the material, this requires ATP.

There are three types: Phagocytosis (cellular eating), Pinocytosis (cellular drinking), or Receptor-Mediated Endocytosis.

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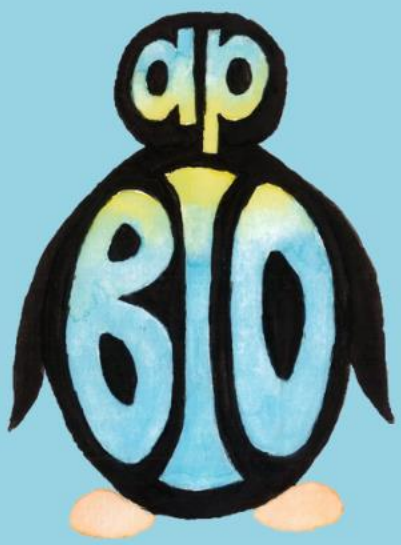

How does Ca^{2+} move across membrane from high to low?

A. Active transport

B. Bulk transport

C. Facilitated transport

D. Simple diffusion

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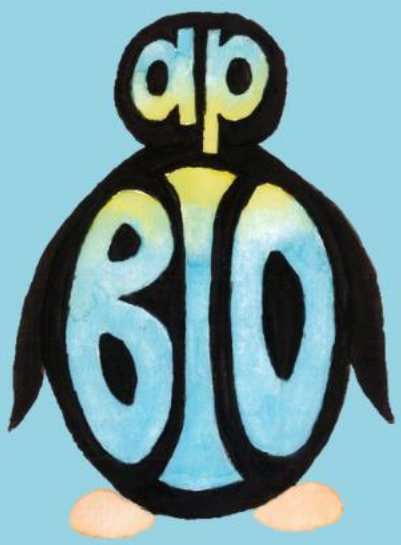

How does Ca^{2+} move across membrane from high to low?

C. Facilitated transport

The calcium ion is charged. Due to this charge, it is hydrophilic and is unable to readily cross the plasma membrane. It will require a transport protein. The prompt states that it is doing from HIGH to LOW, so it will be a type of passive transport.

Passive transport with a protein is facilitated diffusion.

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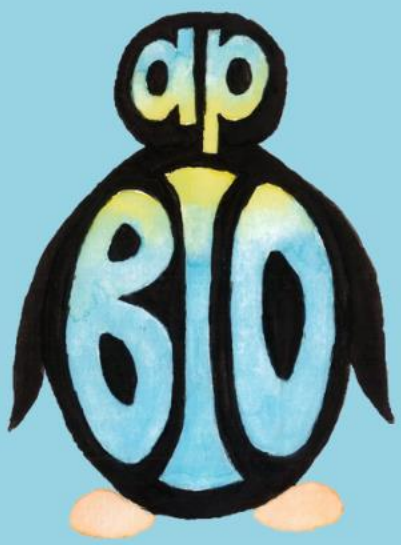

How are secreted proteins moved across the membrane?

A. Active transport

B. Bulk transport

C. Facilitated transport

D. Simple diffusion

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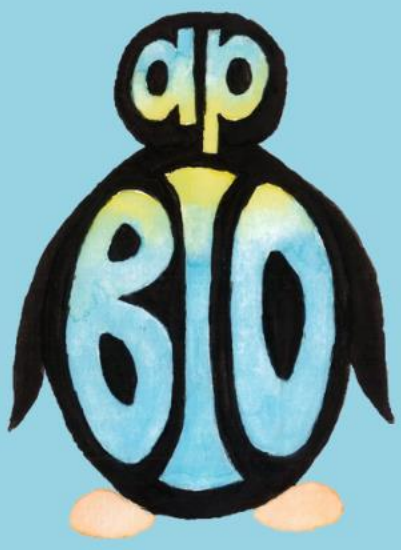
How are secreted proteins moved across the membrane?

B. Bulk transport



The proteins are polar and unable to cross the plasma membrane. This process that releases them is exocytosis. The transport vesicle fuses with the plasma membrane to release the proteins to the extracellular fluid. This is a type of bulk transport.

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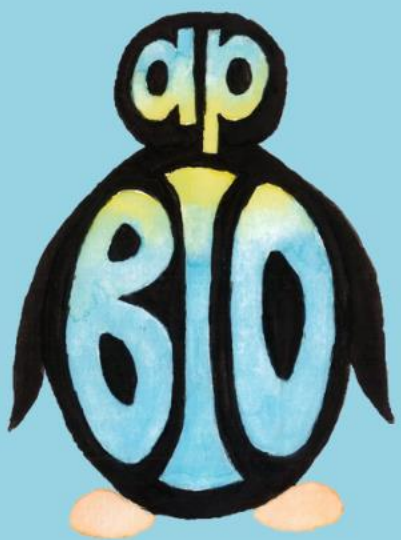

How does oxygen enter blood cells in the lungs?

A. Active transport

B. Bulk transport

C. Facilitated transport

D. Simple diffusion

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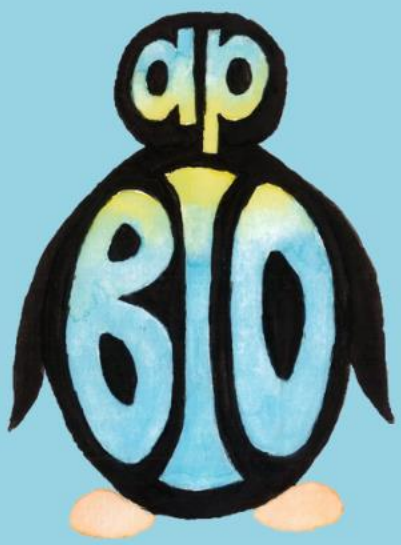

How does oxygen enter blood cells in the lungs?

D. Simple diffusion

Oxygen is a small, nonpolar molecule. This means that it is able to cross the plasma membrane without the use of a protein. The oxygen needs to enter the blood cells to be carried around the body, so it will be moving from HIGH to LOW which describes passive transport.

Passive transport without a transport protein is called simple diffusion.