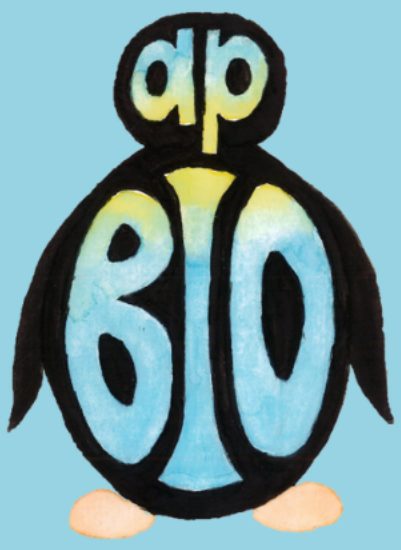
AP BIO INSTA-REVIEW

TOPIC 2.10



Compartmentalization

ENE-2.K.1

Membranes and membrane-bound organelles in eukaryotic cells compartmentalize intracellular metabolic processes and specific enzymatic reactions.

ENE-2.L.1

Internal membranes facilitate cellular processes by minimizing competing interactions and by increasing surface areas where reactions can occur.

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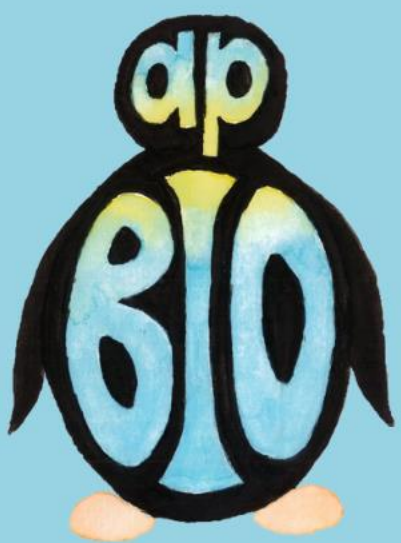

Which of the following does not have a large surface area?

A. Endoplasmic reticulum

B. Golgi Bodies

C. Lysosome

D. Mitochondria

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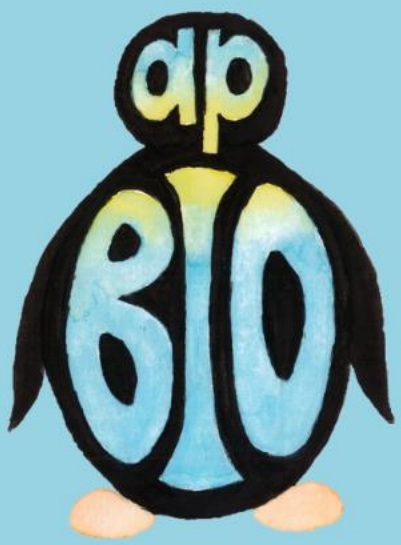
Which of the following does not have a large surface area?

C. Lysosome



This question was looking at which does NOT have large surface area. The endoplasmic reticulum is highly folded, Golgi bodies are made up of multiple cisternae, and the inner membrane of the mitochondria is highly folded. The lysosome is just a single sac of hydrolytic enzymes.

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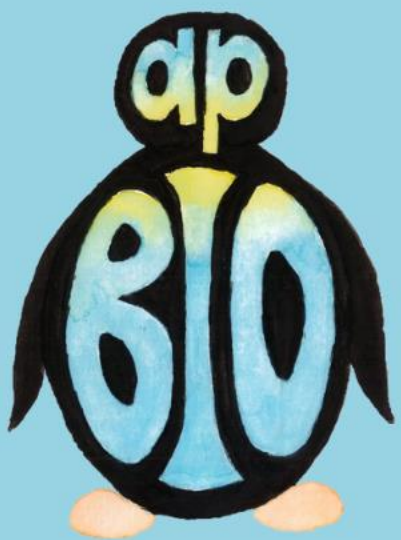

What is the function of the membrane in lysosome?

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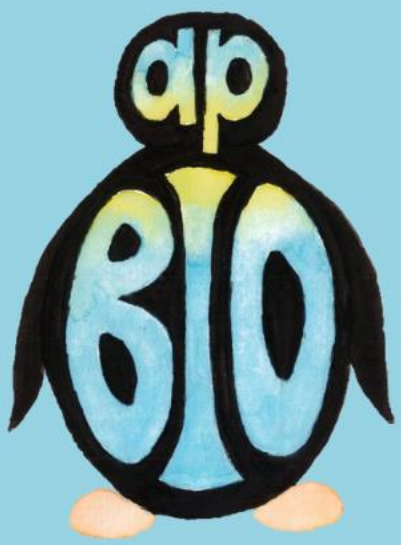

What is the function of the membrane in lysosome?

To separate the hydrolytic enzymes from the cytosol of the cell.

Lysosome is responsible for digestion. The enzymes within the lysosome will break down materials. The membrane keeps those enzymes within this compartment for this specialized function.

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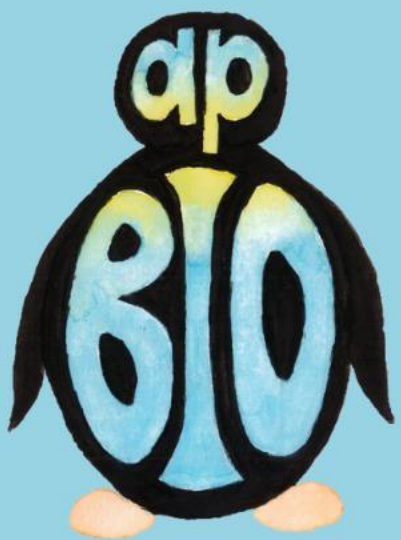

How is the lysosome formed?

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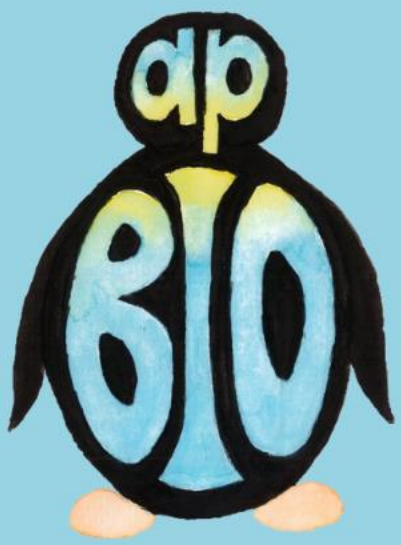

How is the lysosome formed?

Hydrolytic enzymes are synthesized in the Rough ER. The enzymes are packaged in the Golgi bodies. Then when it buds from the Golgi, the lysosome is formed.

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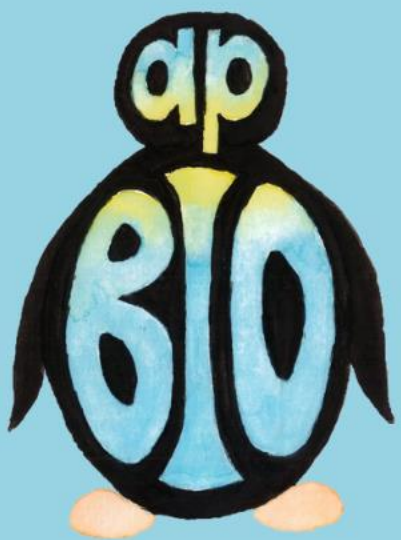

What is the function of increase surface area in mitochondria?

A. More sites for fermentation

B. More sites for glycolysis

C. More sites for Krebs cycle

D. More sites for oxidative phosphorylation

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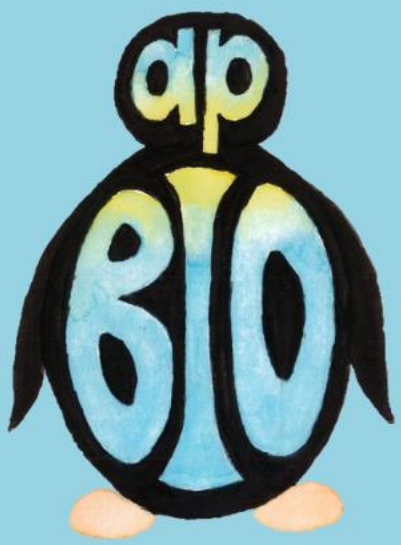

What is the function of increase surface area in mitochondria?

D. More sites for oxidative phosphorylation

The inner membrane (cristae) of the mitochondria has a large surface area. The last step of cellular respiration (oxidative phosphorylation) takes place on this membrane.

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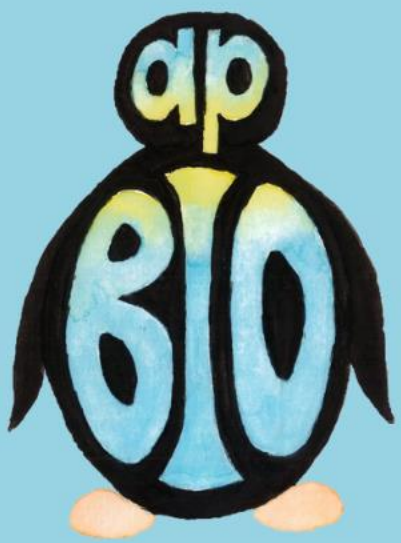

What is the function of the increase in surface area of rough ER?

A. More sites for ATP synthesis

B. More sites for digestion

C. More sites for lipid synthesis

D. More sites for protein synthesis

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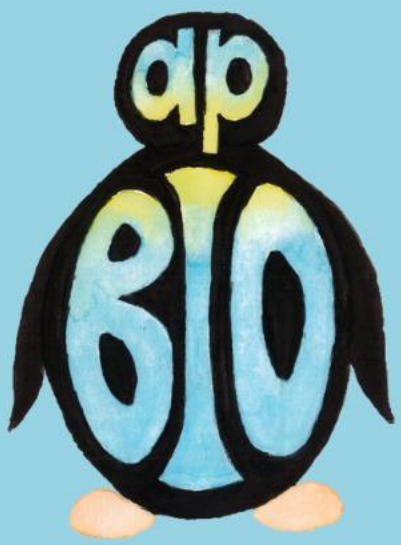

What is the function of the increase in surface area of rough ER?

D. More sites for protein synthesis

The rough ER has a large surface area. The membrane of the ER provides locations for ribosomes to bind to synthesize membrane proteins or proteins for secretion. More surface area provides more space for protein synthesis.

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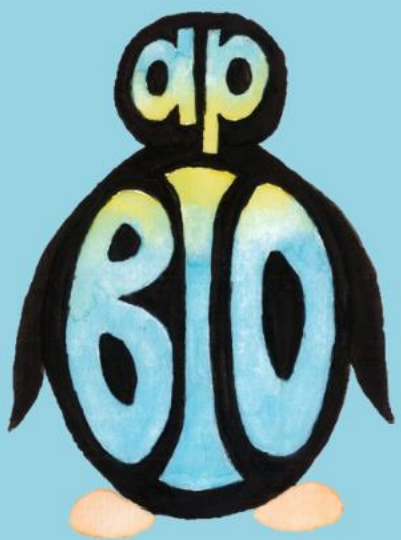

What is the function of the increased surface area in Golgi Bodies?

A. More sites for ATP synthesis
B. More sites for lysosome formation
C. More sites for protein modification
D. More sites for protein synthesis

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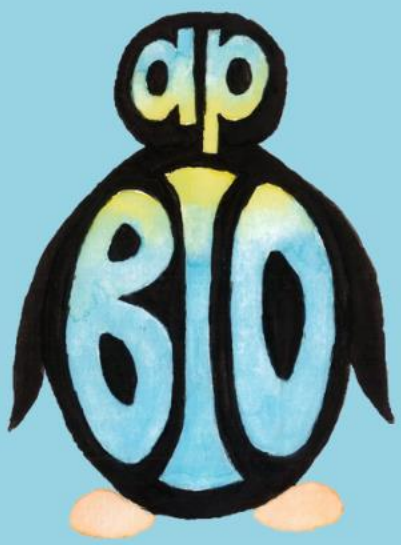

What is the function of the increased surface area in Golgi Bodies?

C. More sites for protein modification

The Golgi bodies are made up of multiple sacs called cisternae. The function of the Golgi is for sorting and modifying the products from the rough ER (proteins) so an increase of surface area provides more sites for that process.

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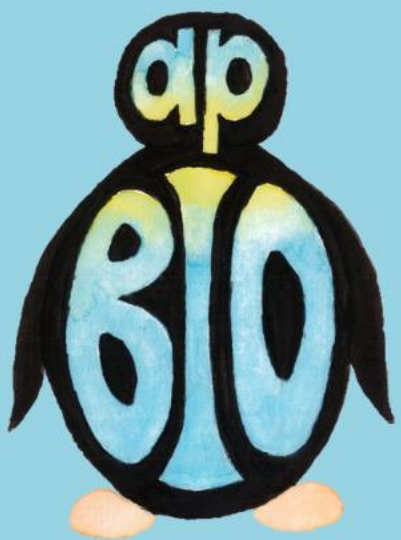

Why must the cell be compartmentalized?

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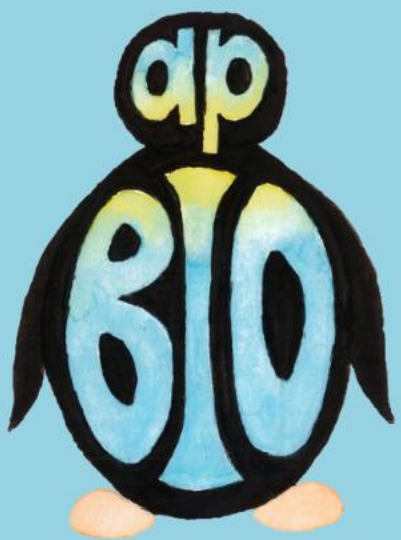

Why must the cell be compartmentalized?

To allow for the increased size of the cell.

Remember to increase the volume of the cell, there must be an increase in surface area. In order to "decrease" the volume, there are compartments made to divide the volume.

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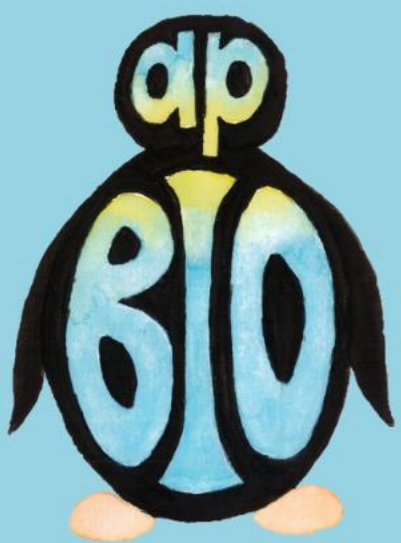

Which process takes place on the cristae of the mitochondria?

A. Calvin Cycle

B. Krebs Cycle

C. Light Reactions

D. Oxidative Phosphorylation

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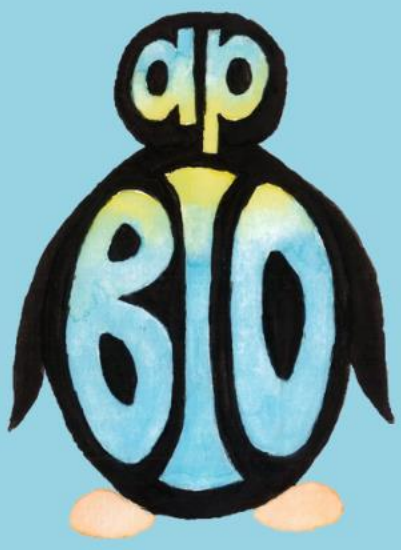
Which process takes place on the cristae of the mitochondria?

D. Oxidative Phosphorylation



The inner membrane of the mitochondria (cristae) is the site for oxidative phosphorylation. This is the last step of cellular respiration which includes the electron transport chain and chemiosmosis.

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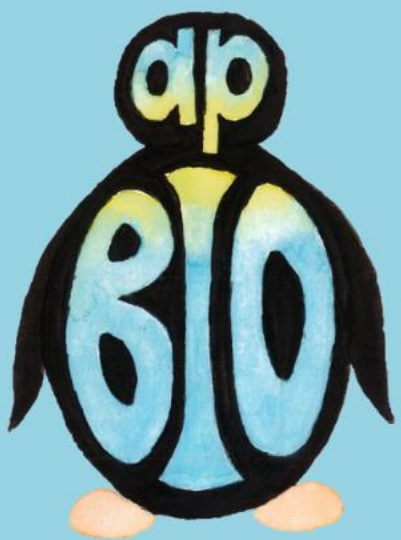

Which process takes place on the thylakoid membrane?

A. Calvin Cycle

B. Krebs Cycle

C. Light Reactions

D. Oxidative Phosphorylation

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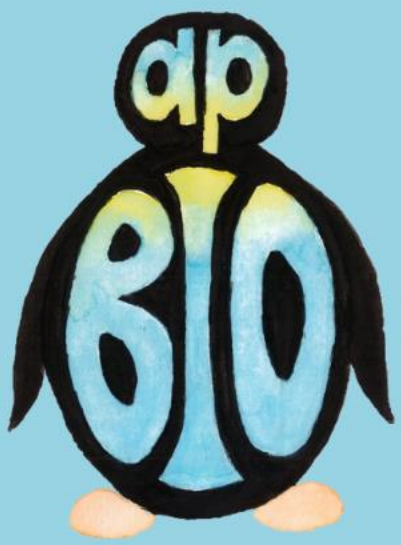

Which process takes place on the thylakoid membrane?

C. Light Reactions

The thylakoid is the sac structure in chloroplasts. In the membrane of the thylakoid is chlorophyll for photosynthesis. The light is absorbed here for the light reactions.

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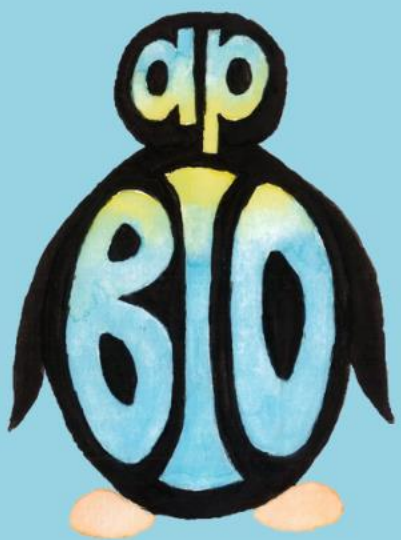

How are eukaryotic cells larger than prokaryotic cells?

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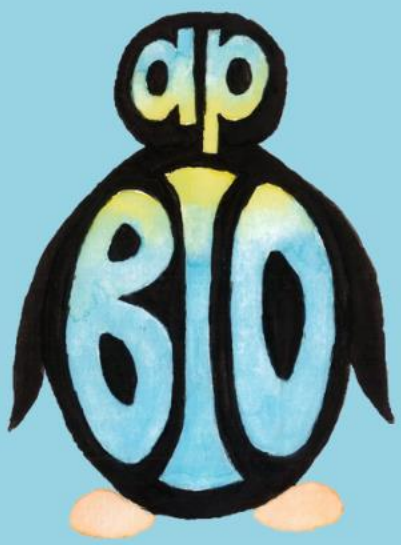
How are eukaryotic cells larger than prokaryotic cells?



Eukaryotic cells have membrane bound organelles. These organelles provide for compartmentalization which allows for larger cells.

Prokaryotic cells do not have membrane bound organelles.

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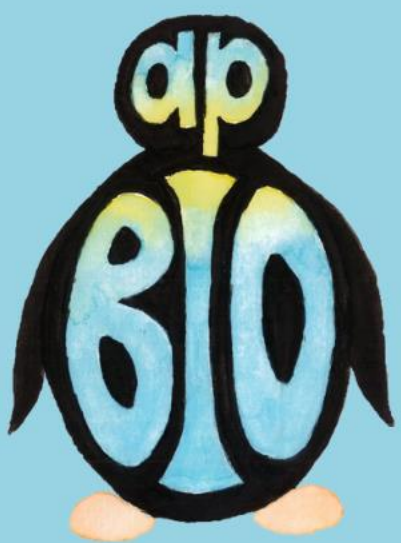

Which organelles are highly folded?

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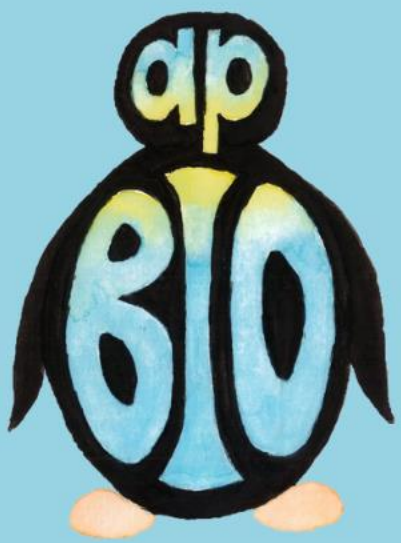

Which organelles are highly folded?

Rough ER
Golgi Complex
Mitochondria
Chloroplast