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Attempt 1 of 2

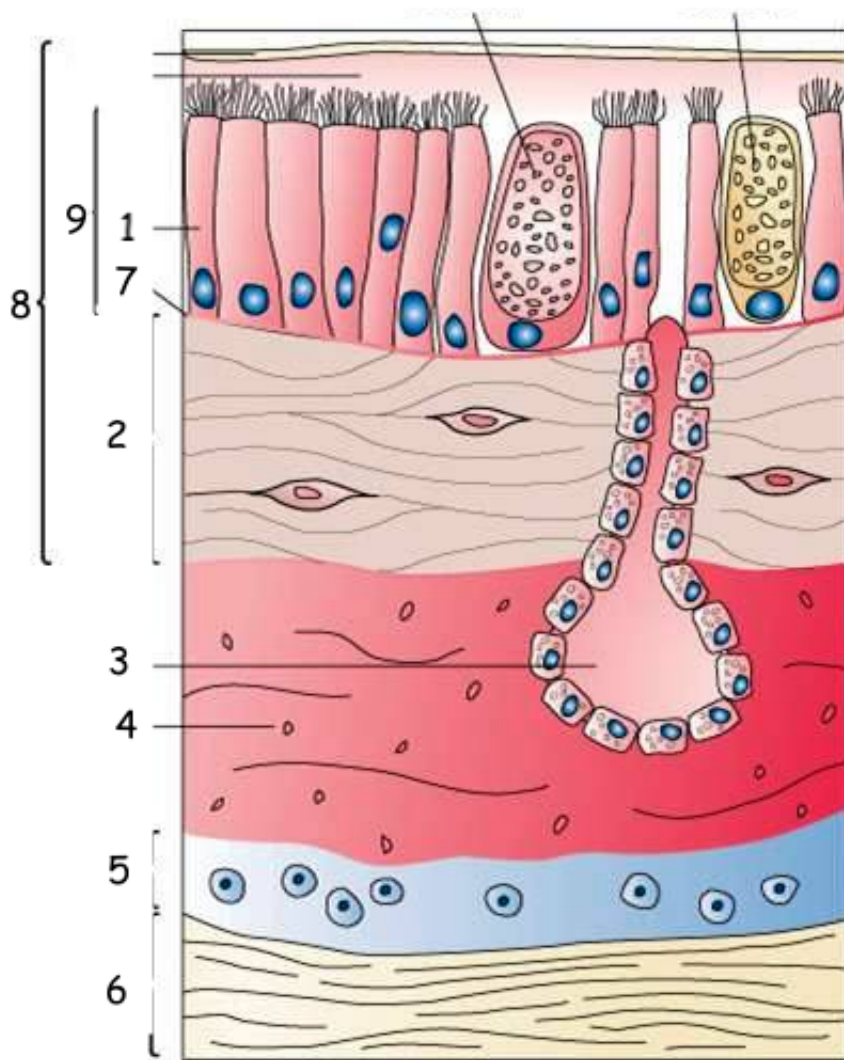
Written Feb 28, 2024 10:07 AM - Feb 28, 2024 10:08 AM

Your quiz has been submitted successfully.

Attempt Score **0 / 50 - 0 %**

Question 1

0 / 1 point



The relationship between the layer labeled 9 and the layer labeled 2 is very important in human physiology. The layer labeled 9 is

- ☐ a connective tissue layer
- ☐ an epithelium
- ☐ a nervous tissue layer
- ☐ the lamina propria
- ☐ a smooth muscle layer

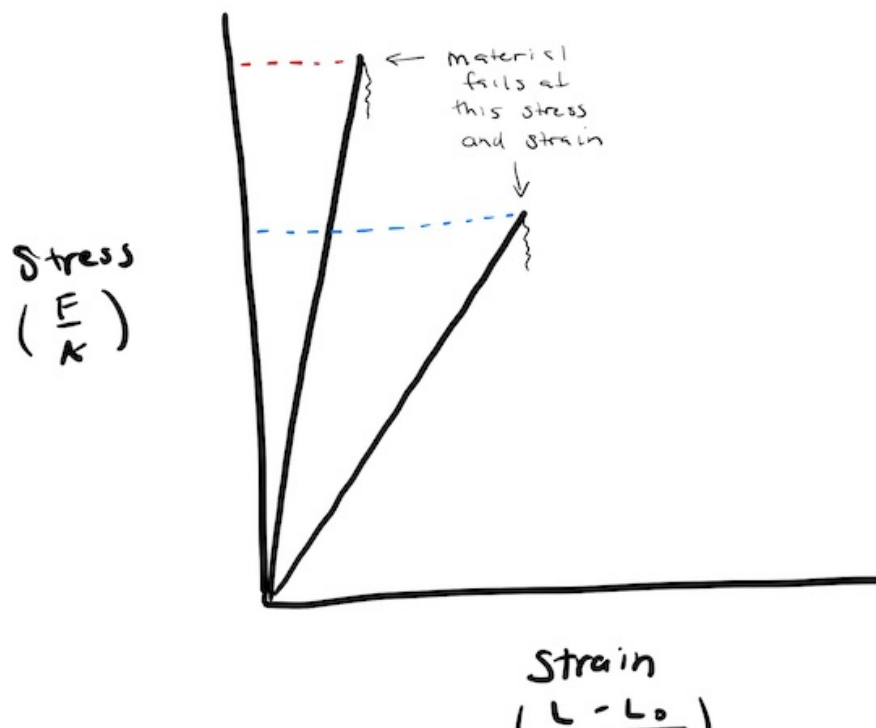
Question 2**0 / 1 point**

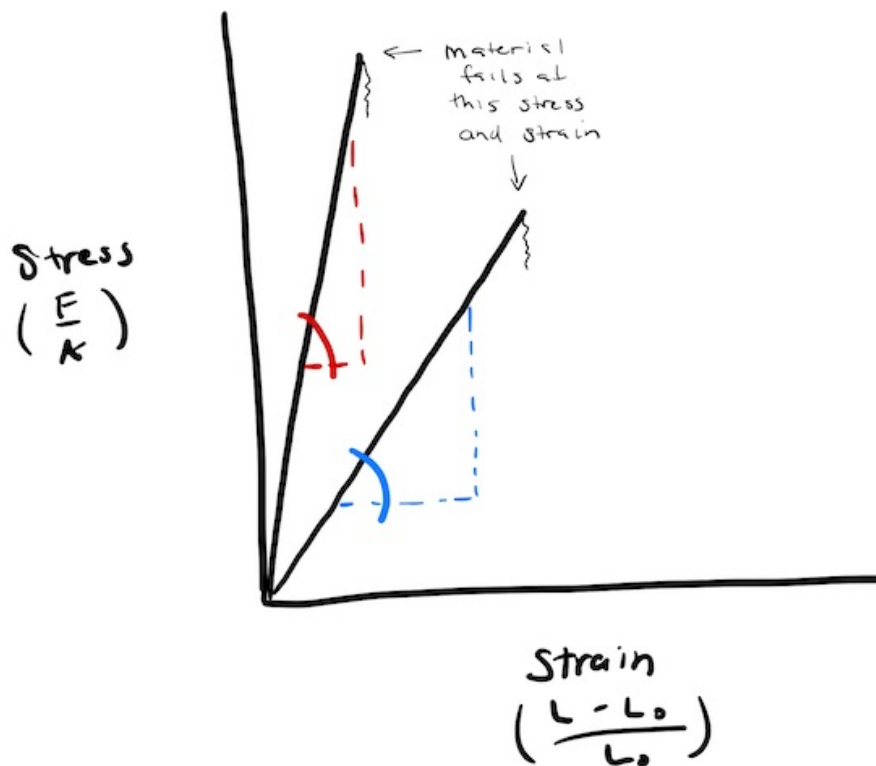
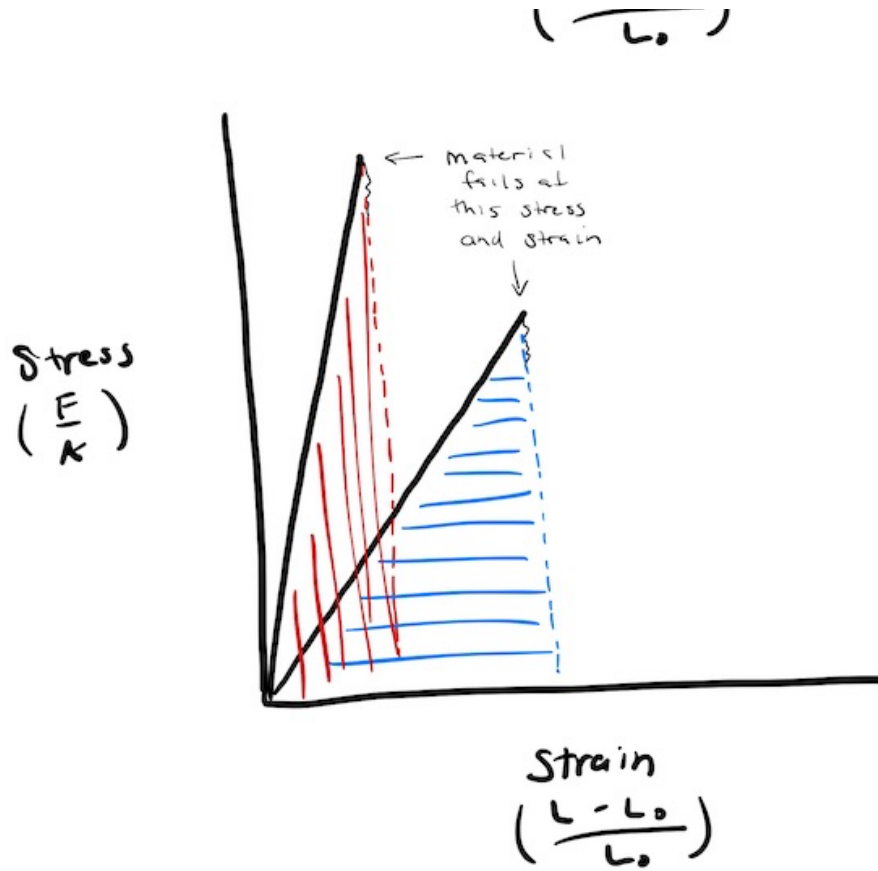
"molecules that are suspended or dissolved in a fluid and transported with the moving fluid" is the definition of transport by

- ☐ exocytosis
- ☐ active transport
- ☐ bulk flow
- ☐ dispersion
- ☐ diffusion

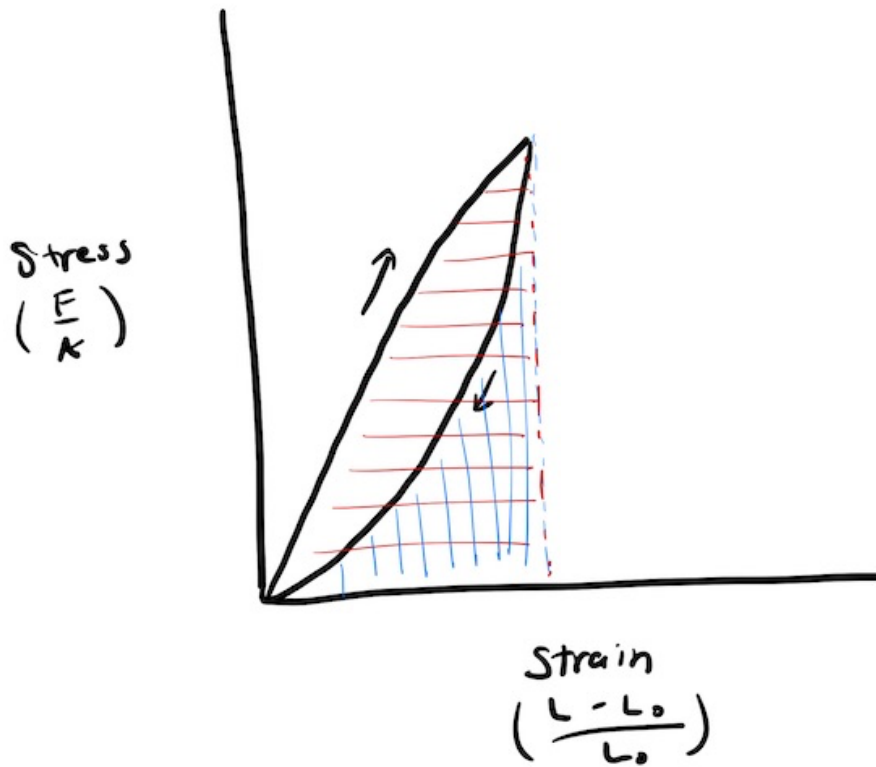
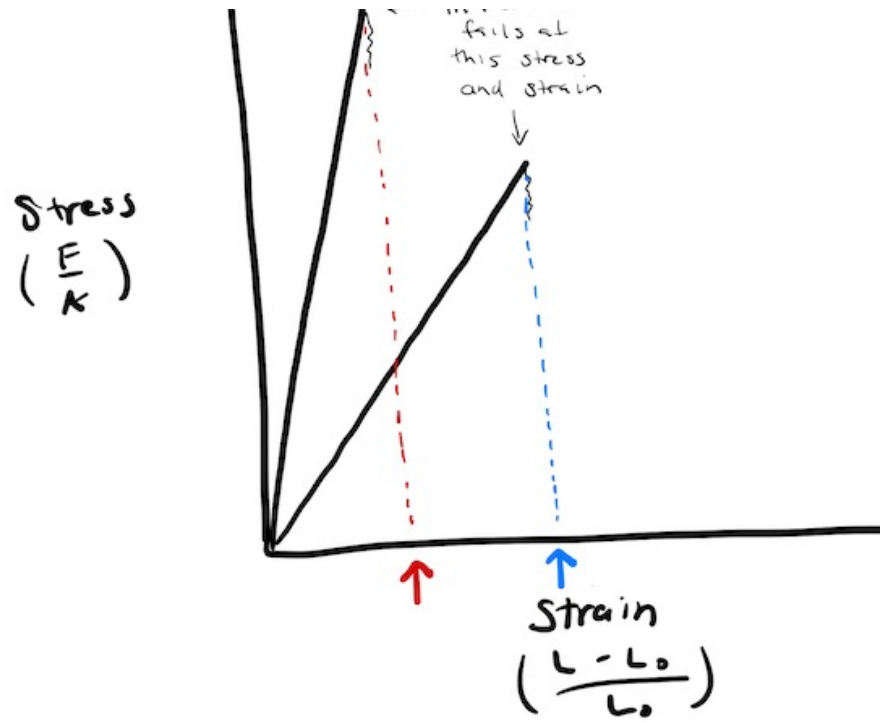
Question 3**0 / 1 point**

Ligaments of our foot and tendons in our calf store and release elastic strain energy, which reduces the energy that we need from our muscles to walk and run. The red and blue colors capture the property of elastic energy storage and release in which image?



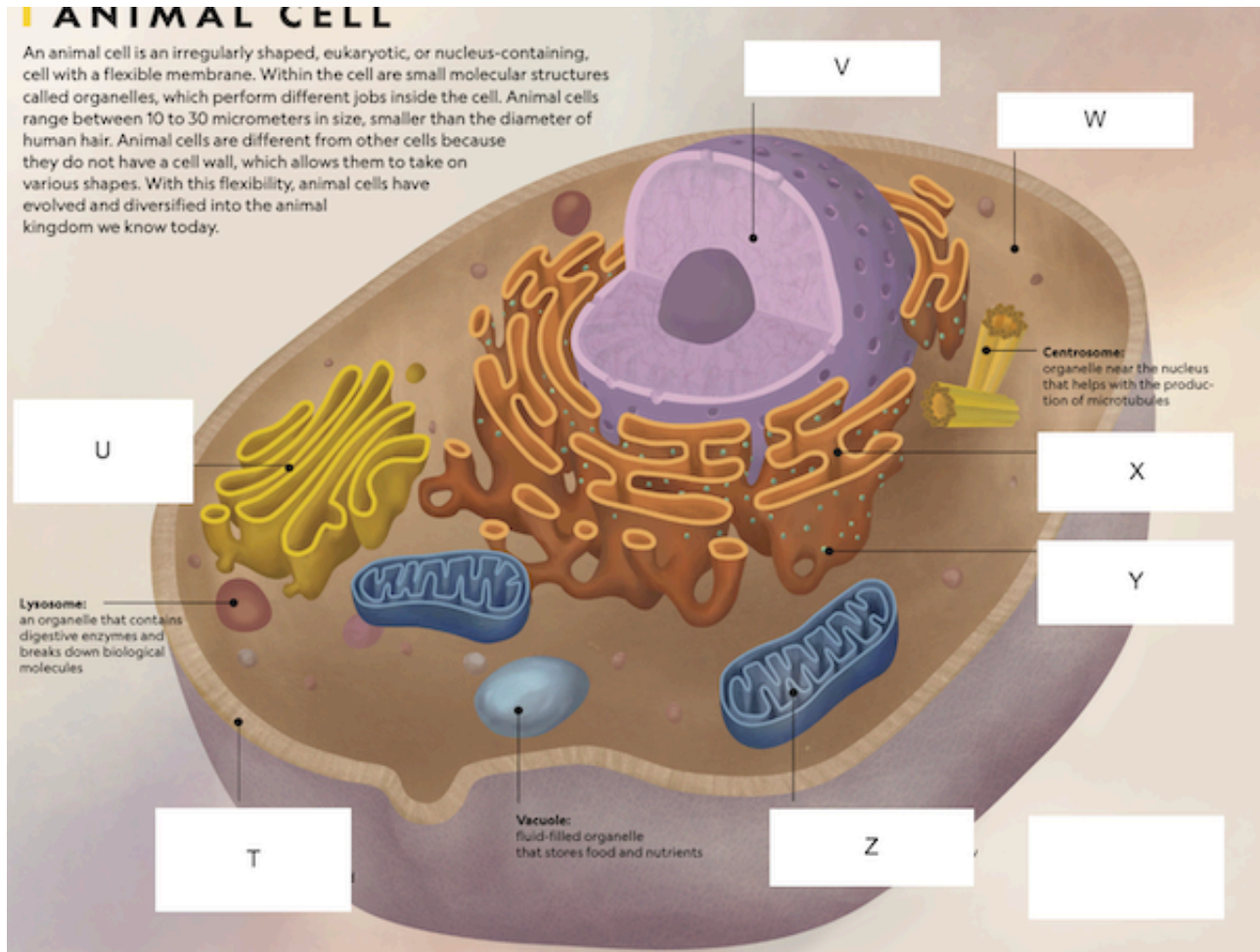


1. material



Question 4

0 / 1 point



The structure labelled "V" is

- ☐ mitochondrion
- ☐ endoplasmic reticulum
- ☐ vessicle
- ☐ nucleus
- ☐ ribosome

Question 5

0 / 1 point

I've just put a jawbreaker candy in my mouth and begin to chew. I want teeth and jaw bones that can absorb tremendous energy without breaking.

These skeletal elements need to be

- ☐ stiff
- ☐ extensible
- ☐ compliant
- ☐ tough
- ☐ strong

Question 6

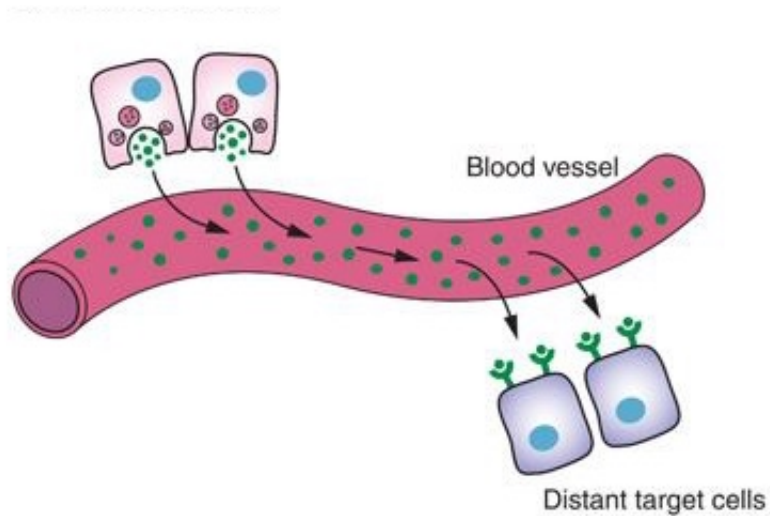
0 / 1 point

A solution of pH 3 is _____ compared to a solution with a pH of 6 (fill in the blank)

- ☐ 3 X less acidic
- ☐ 1000 X more acidic
- ☐ 1000 X less acidic
- ☐ 2 X more acidic
- ☐ 2 X less acidic

Question 7

0 / 1 point

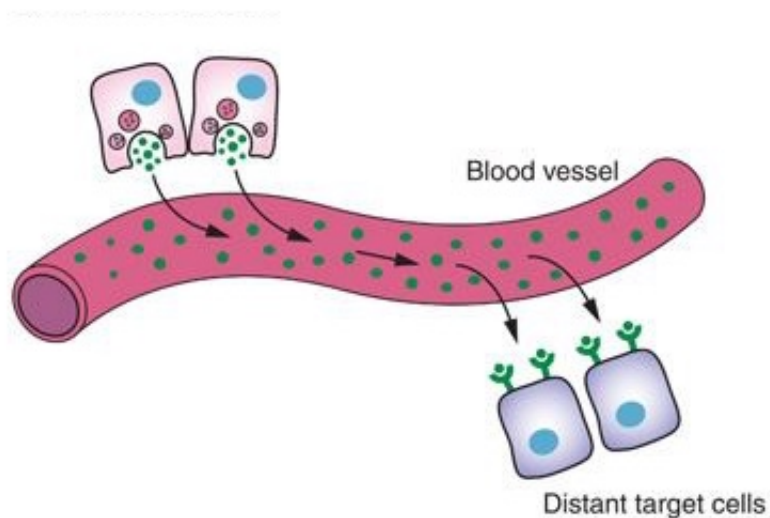


The signaling molecule illustrated in this figure is a

- ☐ paracrine
- ☐ ion
- ☐ second messenger
- ☐ lipid
- ☐ hormone

Question 8

0 / 1 point

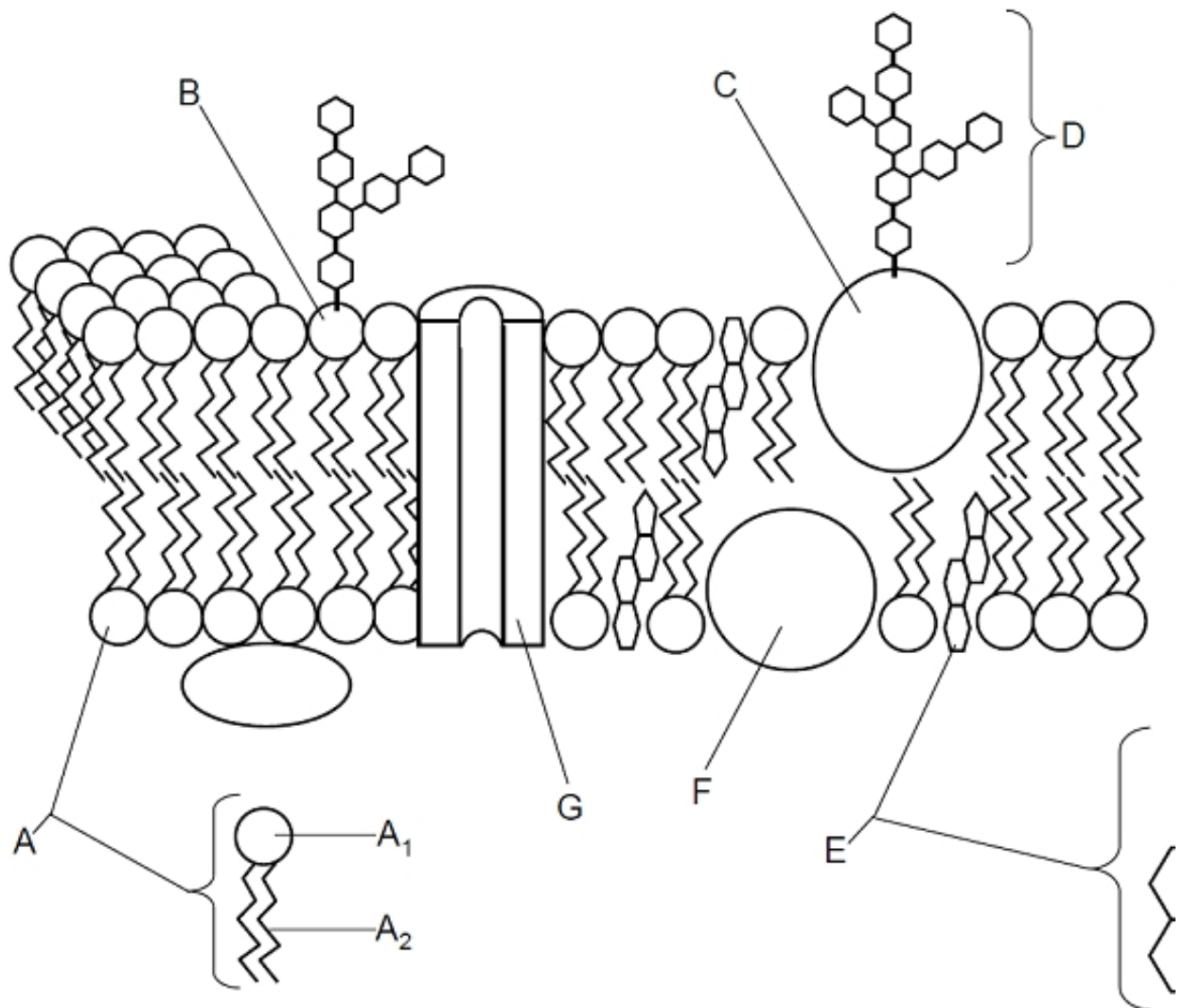


The signaling illustrated in the figure above is

- ☐ exocrine
- ☐ paracrine
- ☐ nervous
- ☐ autocrine
- ☐ endocrine

Question 9

0 / 1 point

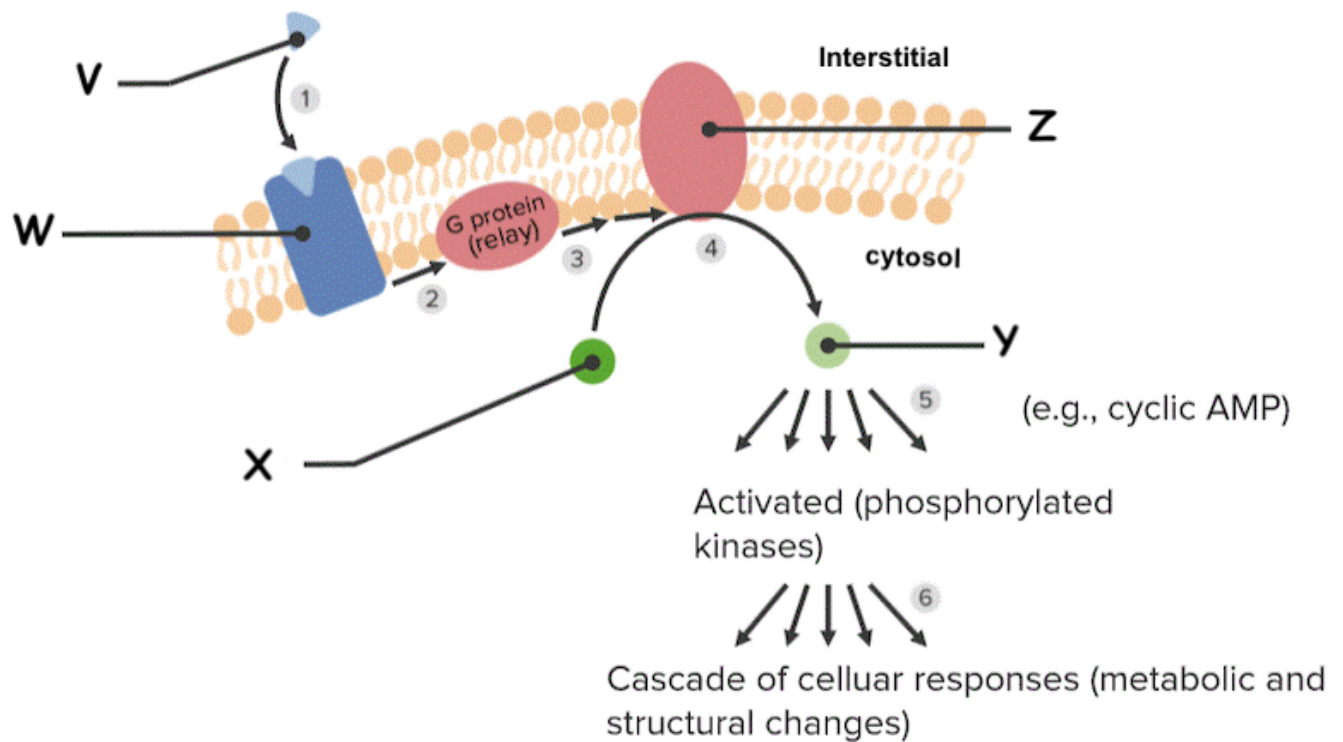


The structure labeled A in the image above is a

- ☐ epithelial cell
- ☐ DNA molecule
- ☐ phospholipid
- ☐ protein
- ☐ carbohydrate

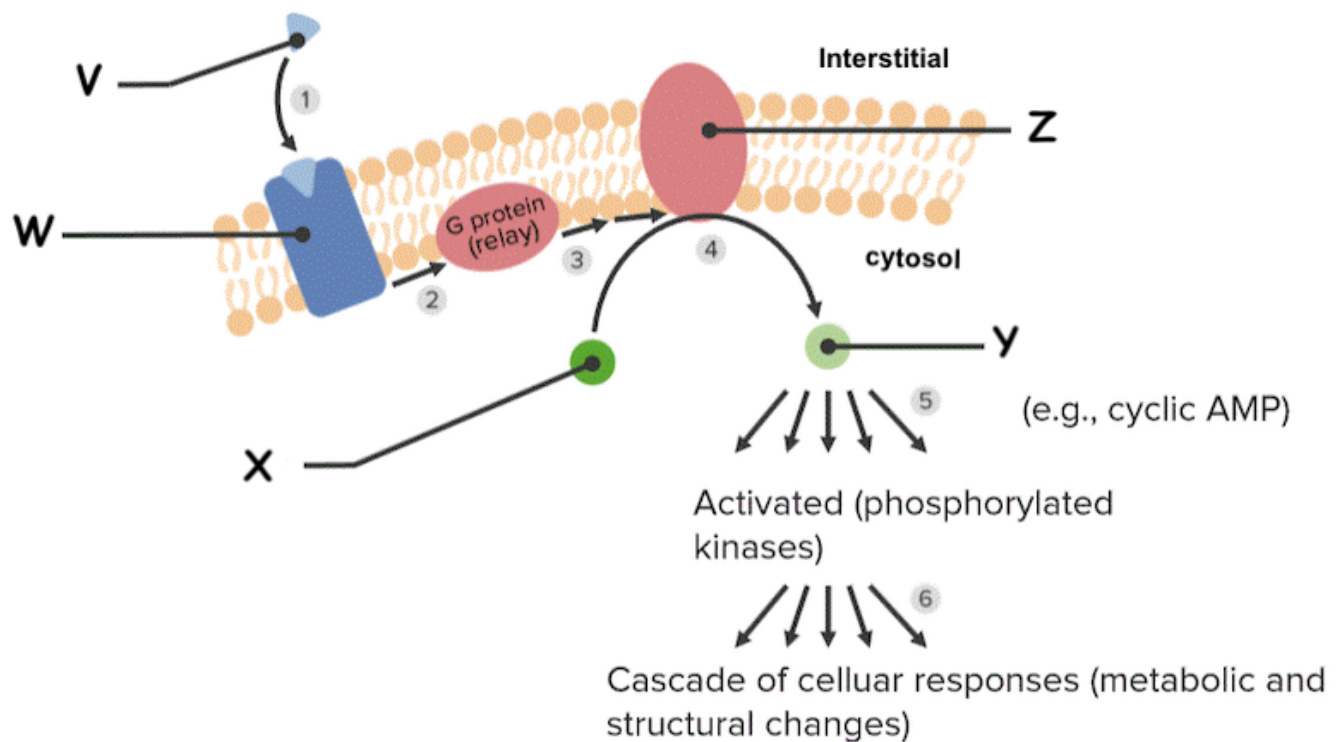
Question 10

0 / 1 point



The structure labeled by "W" is a

- ☐ hormone
- ☐ protein kinase
- ☐ transporter
- ☐ 2nd messenger
- ☐ receptor

Question 11**0 / 1 point**

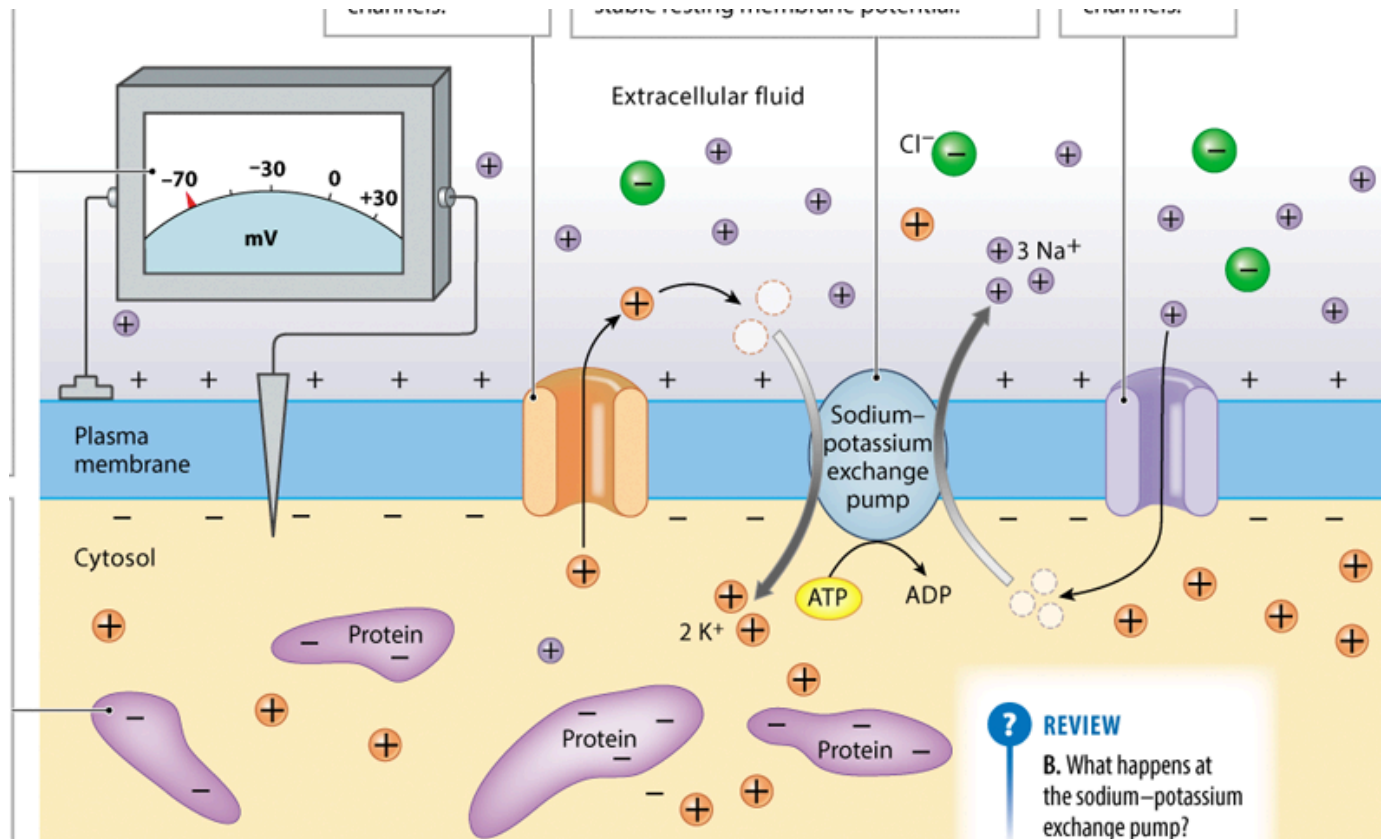
Let's say this is an image of norepinephrine signaling. Norepinephrine is a neurotransmitter. Which molecule is norepinephrine?

☐ X☐ Y☐ Z☐ V☐ W**Question 12****0 / 1 point**

The nucleus of a cell

- ☐ is the site of protein synthesis (translation)
- ☐ is the major site of ATP synthesis
- ☐ controls protein synthesis
- ☐ breaks down ("digests") proteins and other big organic molecules
- ☐ trafficks proteins to their site of function

Question 13**0 / 1 point**



The image above shows a K^+ channel (in orange). This K^+ transport is by

- ☐ secondary active transport, because the cell is transporting K^+ up its electrochemical gradient and the energy is ultimately powered by the Na^+/K^+ pump to create the K^+ gradient
- ☐ facilitated diffusion, because the diffusion requires a protein to make the membrane permeable to K^+
- ☐ facilitated diffusion, because the diffusion requires the Na^+/K^+ pump to create the K^+ gradient
- ☐ active transport, because the cell is transporting K^+ up its electrochemical gradient
- ☐ facilitated diffusion, because a protein transporter is necessary to transport K^+ up its electrochemical gradient

Question 14

0 / 1 point

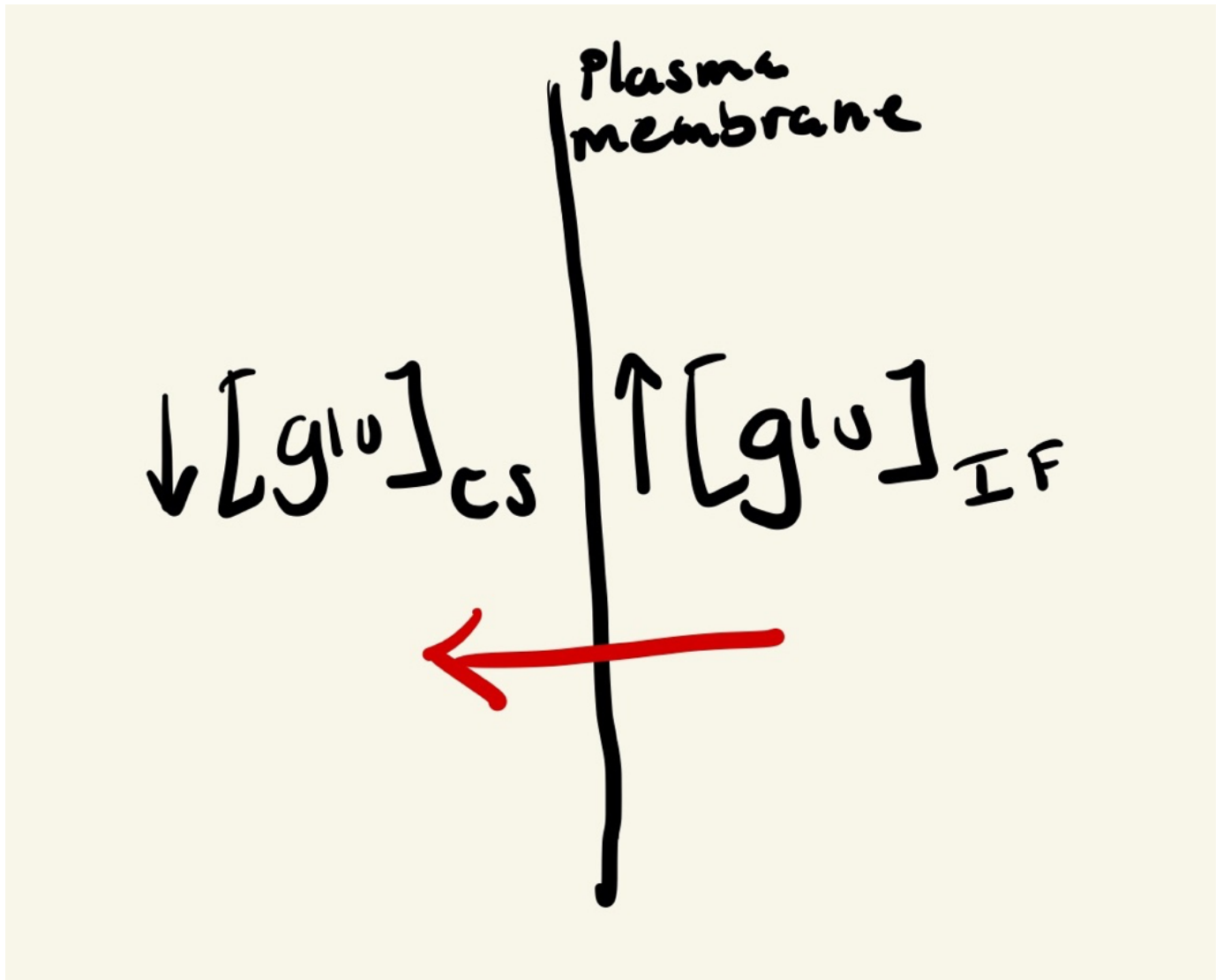
The fluid that fills the space between cells in all tissue except blood

is a pretty good definition of

- ☐ extracellular fluid
- ☐ interstitial fluid
- ☐ plasma
- ☐ filtrate
- ☐ serum

Question 15

0 / 1 point



in the image above, the red arrow indicates

- ☐ that diffusion will drive the concentration of glucose in the IF to the concentration of glucose in the CS
- ☐ the direction and rate of transport across the membrane by diffusion. The rate is proportional to the length of the arrow.
- ☐ the direction of "up the concentration gradient"
- ☐ the direction that glucose transporters transport glucose across a membrane
- ☐ the direction and speed of movement of glucose across the membrane

Question 16**0 / 1 point**

The image shows the femur bone. This bone is composed of

- ☐ muscle, epithelial, connective, and nervous tissues
- ☐ muscle, connective, and adipose tissue only
- ☐ muscle and connective tissues only
- ☐ connective tissue only
- ☐ connective and adipose tissues only

Question 17**0 / 1 point**

adipocytes are cells of adipose tissue. Adipocytes are specialized for

- ☐ secrete skeletal proteins and other organic molecules into the extracellular matrix
- ☐ contract to produce a force
- ☐ secrete stuff onto an epithelial surface
- ☐ conduct electrical impulses to communicate with other cells
- ☐ storing fatty acids

Question 18**0 / 1 point**

We have trillions of bacterial cells on and in our body. A typical bacterial cell is about how big in diameter (or width)?

- ☐ 1 m
- ☐ 1 μm
- ☐ 1 mm
- ☐ 1 cm
- ☐ 1 nm

Question 19**0 / 1 point**

Vitamin D deficiency can result in calcium and phosphate loss from bone matrix, which results in the disease osteomalacia (or Ricketts in children). As a result of these losses, bone becomes more

- ☐ osteoporotic
- ☐ brittle
- ☐ compliant
- ☐ dense
- ☐ strong

Question 20**0 / 1 point**

A plane through the body that passes perpendicular to the long axis of the body and divides the body into superior and inferior parts is a

- ☐ medial plane
- ☐ transverse plane
- ☐ distal plane
- ☐ sagittal plane
- ☐ frontal plane

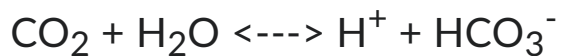
Question 21**0 / 1 point**

The primary structure of a protein is

- ☐ the sequence of amino acids from first to last position
- ☐ the binding site for the major ligand
- ☐ the 3D shape of the protein
- ☐ the classification into globular or filamentous
- ☐ the major function of the protein

Question 22**0 / 1 point**

The reaction



is super important and we'll come back to it in the respiratory and urinary systems. If this reaction is moving to the left, CO₂ is

- ☐ a pharmacological agonist
- ☐ the enzyme
- ☐ a competitive inhibitor
- ☐ a product
- ☐ a substrate

Question 23**0 / 1 point**

Water molecules in our cells

- ☐ are in constant motion, but move at a very slow speed (about 1 mm per hour) because of its small size
- ☐ are in constant motion, moving at an average speed of about 1400 miles per hour
- ☐ are fixed in place in the cell because of the hydrogen bonds that bind them together
- ☐ are fixed in place in the cell because there are no forces moving them
- ☐ are in constant motion, but move at a very slow speed (about 1 mm per hour) because they constant bump into each other

Question 24**0 / 1 point**

Diffusion occurs when

- ☐ a moving fluid transports a particle
- ☐ an individual particle moves down its concentration gradient
- ☐ the energy of a concentration gradient of a chemical powers the net transport of the chemical down its concentration gradient
- ☐ there is net transport of a particle down its concentration gradient
- ☐ a system of particles spreads out across a container

Question 25**0 / 1 point**

cranial fontanelles occur in a newborn baby because

- ☐ the cartilage in the gap between growing bones of the skull roof have not ossified by endochondral growth
- ☐ the cartilage in the gap between growing bones of the skull roof have not ossified by appositional growth
- ☐ the cartilage in the gap between growing bones of the skull roof have not ossified by interstitial growth
- ☐ the dense connective tissue in the gap between growing bones of the skull roof have not ossified by appositional growth
- ☐ the dense connective tissue in the gap between growing bones of the skull roof have not ossified by interstitial growth

Question 26**0 / 1 point**

The bulk transport of molecules into the cytoplasm is by

- ☐ endocytosis
- ☐ primary active transport
- ☐ passive transport
- ☐ exocytosis
- ☐ secondary active transport

Question 27**0 / 1 point**

The cells that secrete osteoid into the ECM are

- ☐ osteocytes
- ☐ osteoblasts
- ☐ fibroblasts
- ☐ osteoclasts
- ☐ chondrocytes

Question 28**0 / 1 point**

Which of the following is the most effective daily activity to maintain bone density as we age?

- ☐ sitting on a chair/couch without a back rest
- ☐ cycling
- ☐ eating a high protein diet
- ☐ swimming
- ☐ walking

Question 29**0 / 1 point**

What is the general name for "intracellular structures suspended within the cytosol with specific functions"

- ☐ proteins
- ☐ membranes
- ☐ solutes
- ☐ organelles
- ☐ cytoskeleton

Question 30**0 / 1 point**

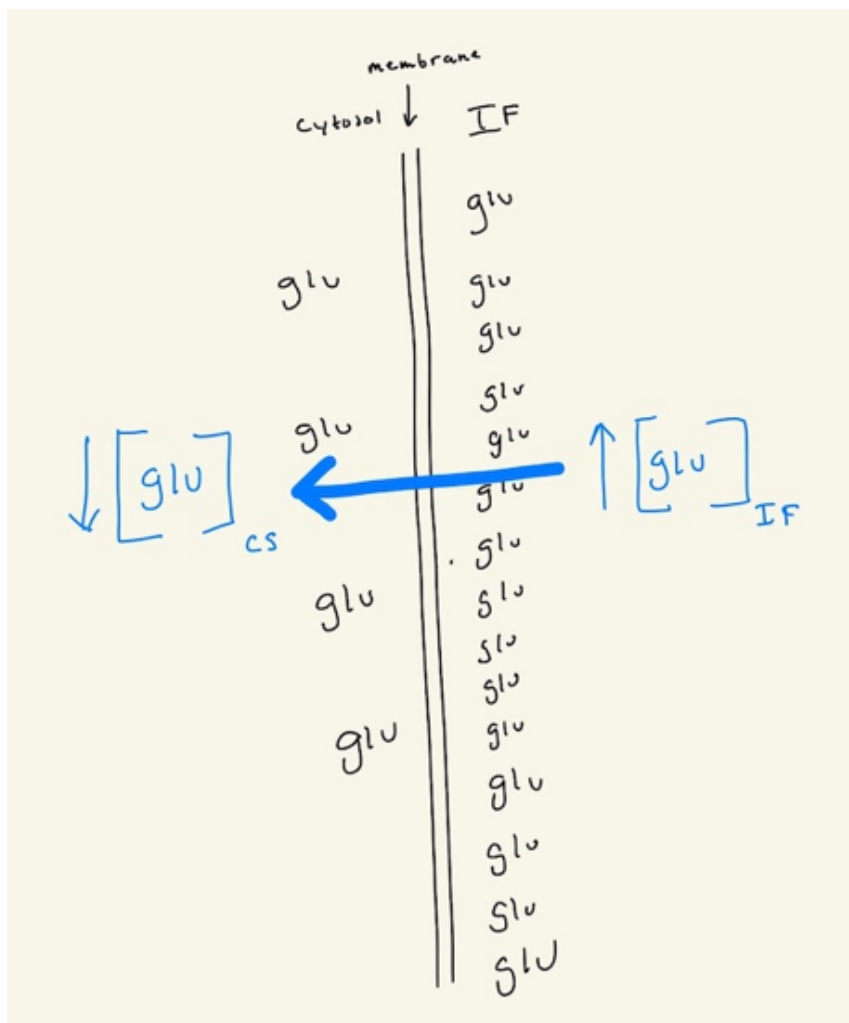
In long bone growth, what hormone signals the stopping of cell division and the ossification of the epiphyseal plate IN FEMALES?

- ☐ testosterone
- ☐ parathyroid hormone
- ☐ cortisol
- ☐ calcitonin
- ☐ estrogen

Question 31**0 / 1 point**

In transcription

- ☐ a protein is synthesized from an RNA template
- ☐ an enzyme binds to DNA and regulates DNA synthesis
- ☐ the entire genome in a cell is duplicated in preparation for cell division
- ☐ a protein is trafficked to the plasma membrane
- ☐ an RNA is synthesized from a DNA template

Question 32**0 / 1 point**

Given the system above, with statement is TRUE?

- ☐ more glucose moves into the cell than out of the cell because of simple statistics - each glucose has 50% probability of moving across the membrane and 50% of the glucose outside the cell (that fraction moving in) is greater than 50% of the glucose inside the cell (that fraction moving out).
- ☐ more glucose moves into the cell than out of the cell because there are too many molecules crowded into the area outside the cell, therefore they move to the side of the cell with more room
- ☐ more glucose moves into the cell than out of the cell because the system needs to achieve equilibrium
- ☐ more glucose moves into the cell than out of the cell because glucose is attracted to the area of low glucose concentration
- ☐ more glucose moves into the cell than out of the cell because there is an external force moving glucose into the cell

Question 33**0 / 1 point**

10^{-3} is

- ☐ 1/3
- ☐ 10/3
- ☐ 1/3000
- ☐ 1/100
- ☐ 1/1000

Question 34**0 / 1 point**

stress is

- ☐ the amount a material that can stretch before it breaks
- ☐ the relative amount of deformation of a material
- ☐ the relative force applied to a material
- ☐ the relative force resisting deformation of a material
- ☐ the amount of energy that can be absorbed by a material before it breaks

Question 35**0 / 1 point**

When standing, a person loads their femur in compression. What does "loads" mean?

- ☐ to store and release elastic energy from a structure
- ☐ to push together, squeeze
- ☐ to apply a force to a structure
- ☐ to contract muscles to reduce force on a structure
- ☐ to pull apart, stretch

Question 36**0 / 1 point**

Collagen makes a structure

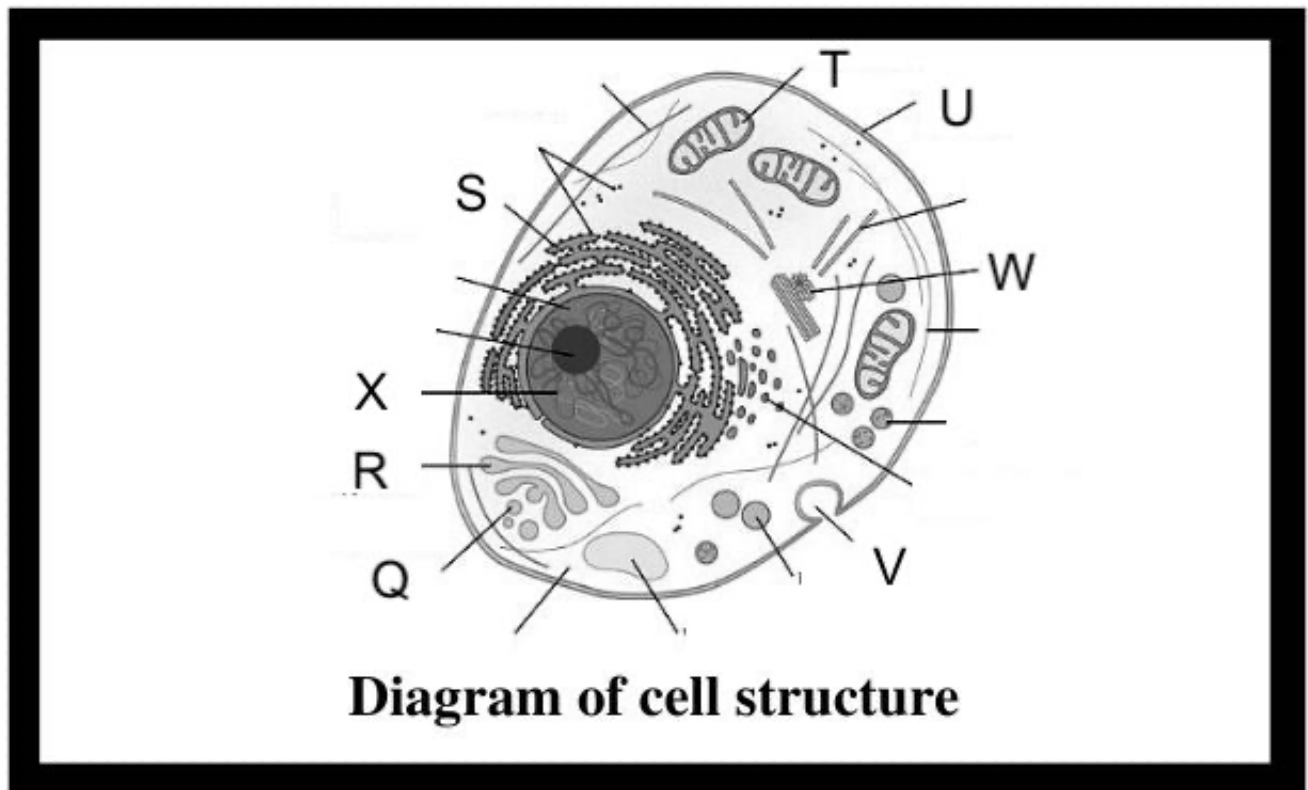
- ☐ compliant in tension AND tough
- ☐ stiff in compression AND have a high capacity for elastic energy storage and recovery
- ☐ stiff in tension AND tough
- ☐ have a high capacity for elastic energy storage and recovery
- ☐ stiff in tension AND compression

Question 37**0 / 1 point**

An "ion pump" is a protein that

- ☐ catalyzes the hydrolysis of ATP and transfers the energy from this reaction to transport ions up their concentration gradient
- ☐ transports one chemical up a concentration gradient by using the energy of an ion concentration gradient
- ☐ catalyzes the hydrolysis of ATP to transport
- ☐ creates a tunnel-like opening to allow the transport of ions across a membrane
- ☐ co-transporters ions

Question 38**0 / 1 point**



The structure labeled T is

- ☐ golgi
- ☐ the nucleus
- ☐ a ribosome
- ☐ a vesicle
- ☐ a mitochondrion

Question 39

0 / 1 point

The signaling molecule aldosterone (super important -- you'll learn this later) signals kidney cells to increase the expression of Na^+/K^+ pumps (a kind of transporter protein). What does this mean?

- ☐ the cell will make more Na^+/K^+ pumps
- ☐ the cell will break down more Na^+/K^+ pumps
- ☐ the cell will secrete more Na^+/K^+ pumps
- ☐ the cell will turn up the rate that each Na^+/K^+ pumps transports Na^+ and K^+
- ☐ the cell will block the activity of Na^+/K^+ pumps

Question 40**0 / 1 point**

A protein whose name ends with the suffix "ase" is almost certainly

- ☐ a motor protein
- ☐ a membrane transporter
- ☐ an enzyme
- ☐ a signaling protein
- ☐ an immune protein

Question 41**0 / 1 point**

vitamin D is

- ☐ a hormone that increases Ca^{++} transfer from bone ECM to the blood
- ☐ a major component of ground substance in connective tissue
- ☐ an enzyme that catalyzes the synthesis of bone ECM
- ☐ a co-enzyme that binds to collagen and facilitates cross-linking, which makes bone tough
- ☐ a substrate for the synthesis of hydroxyapatite

Question 42**0 / 1 point**

We talked about collagen in every lecture in this unit. What is collagen?

- ☐ a protein
- ☐ a nucleic acid
- ☐ an enzyme
- ☐ a hormone
- ☐ a carbohydrate

Question 43**0 / 1 point**

connective tissue cells are embedded in a gelatinous mixture of large organic molecules, protein, and water called

- ☐ extracellular matrix
- ☐ cytoplasm
- ☐ cytosol
- ☐ filtrate
- ☐ plasma

Question 44**0 / 1 point**

The cartilaginous junction between the diaphysis and epiphysis is the

- ☐ marrow cavity
- ☐ compact bone
- ☐ trabeculae
- ☐ spongy bone
- ☐ epiphyseal plate

Question 45**0 / 1 point**

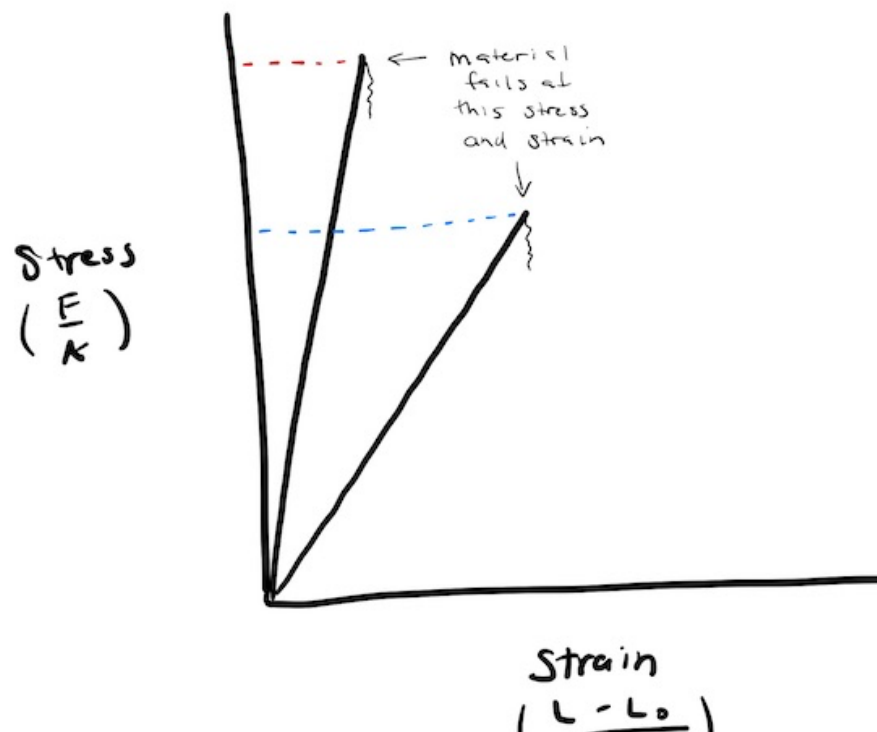
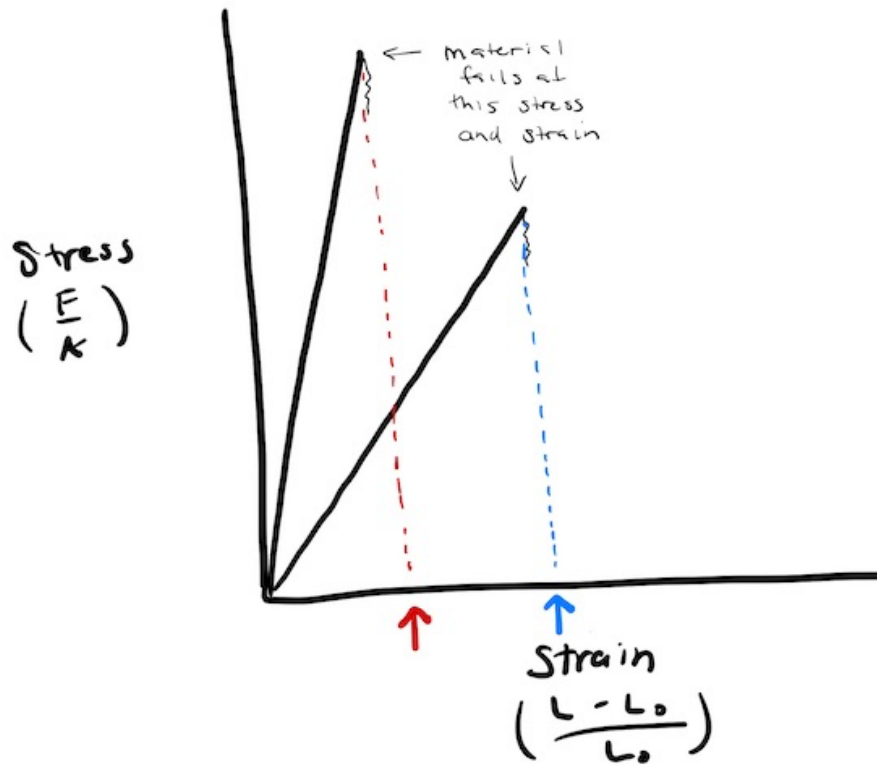
Hydrophobic molecules

- ☐ tend to have a high oxygen atom content
- ☐ have a net charge
- ☐ tend to be insoluble (not dissolve) in water
- ☐ have numerous polar covalent bonds
- ☐ tend to be very small

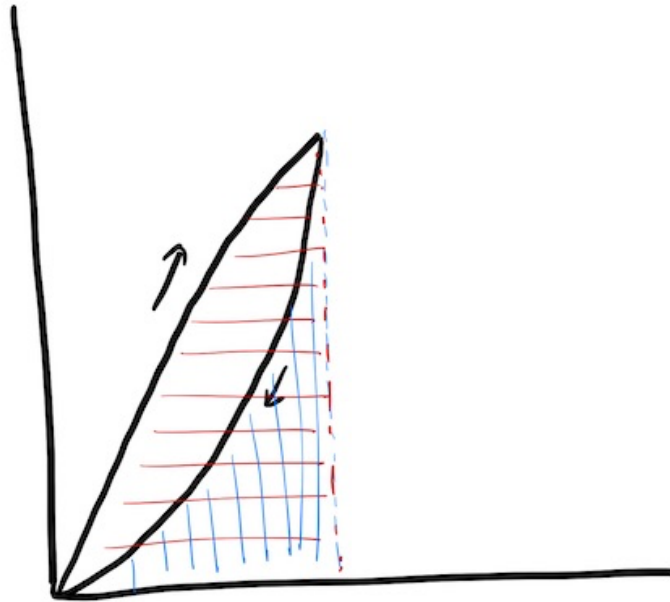
Question 46

0 / 1 point

Bone is tough. The red and blue colors capture the property of toughness in which image?

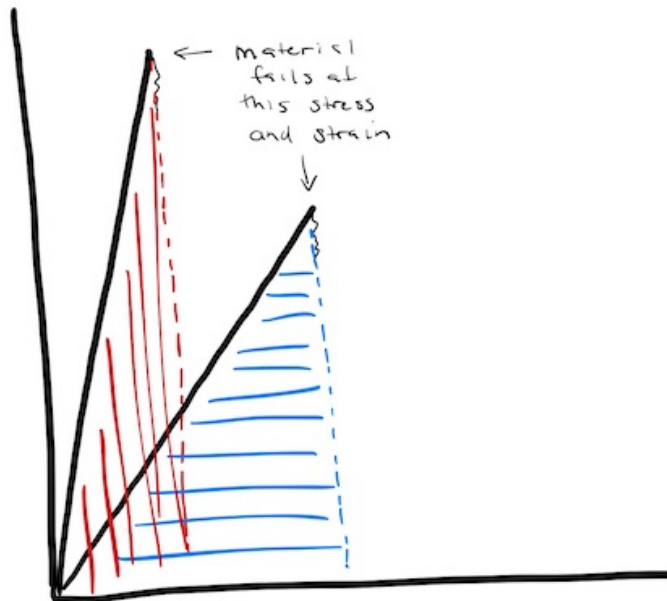


Stress
 $\left(\frac{F}{A} \right)$



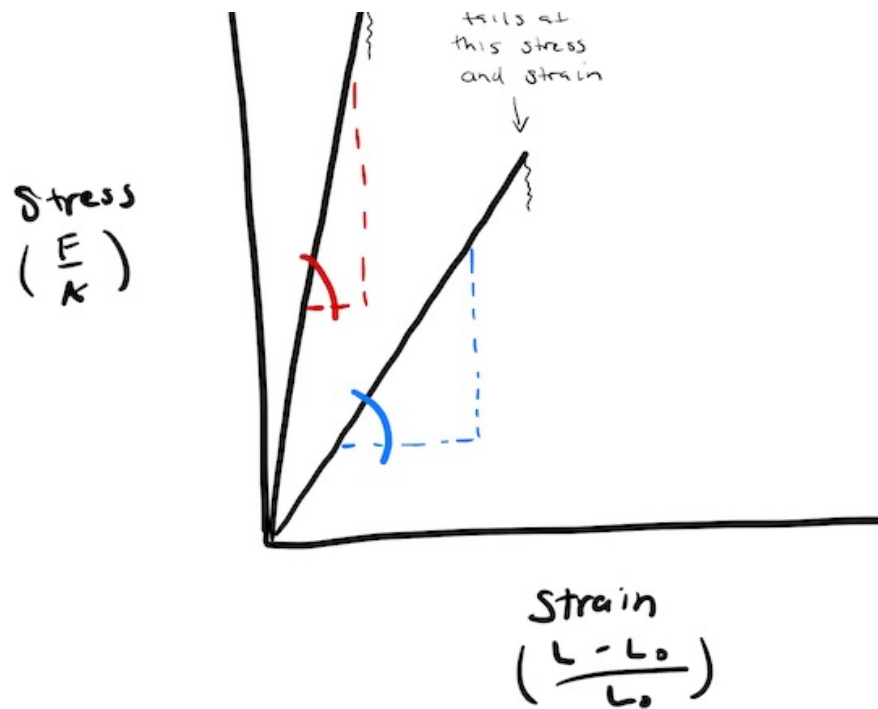
Strain
 $\left(\frac{L - L_0}{L_0} \right)$

Stress
 $\left(\frac{F}{A} \right)$



Strain
 $\left(\frac{L - L_0}{L_0} \right)$

← material



Question 47

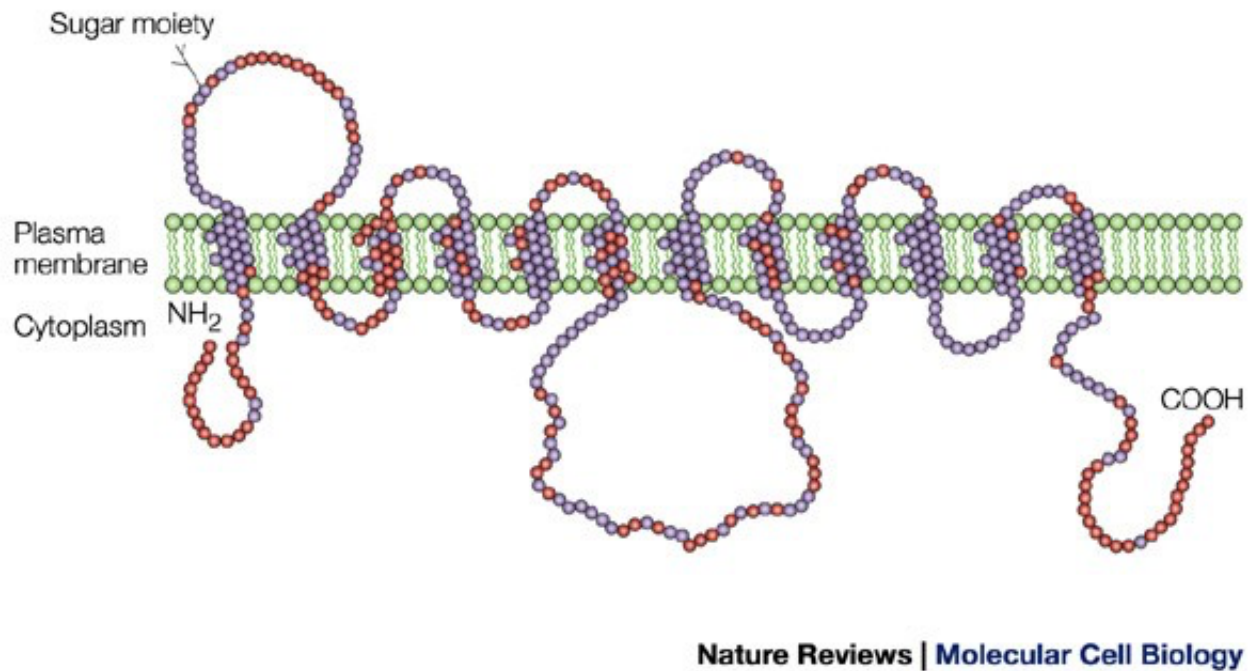
0 / 1 point

the major cell type of the connective tissue in tendon and ligament is the

- ☐ osteoblast
- ☐ fibroblast
- ☐ chondrocyte
- ☐ osteocyte
- ☐ myocyte

Question 48

0 / 1 point



The image above shows how the Glucose Transporter 4 (GLUT4) molecule loops back and forth across the plasma membrane. What are each of the little balls in the GLUT4 molecule?

- ☐ a fatty acid
- ☐ a nucleic acid
- ☐ a glucose
- ☐ an amino acid
- ☐ a nucleotide

Question 49

0 / 1 point

We should never forget the important fact that a small part of our DNA occurs in

- ☐ mitochondria
- ☐ endoplasmic reticula
- ☐ the plasma membrane
- ☐ lysosomes
- ☐ ribosomes

Question 50**0 / 1 point**

A sodium atom has 11 protons. Dissolved sodium

- ☐ has lost a proton
- ☐ has lost an electron
- ☐ has gained an electron
- ☐ has gained a proton
- ☐ has lost an electron AND gained a proton

Done