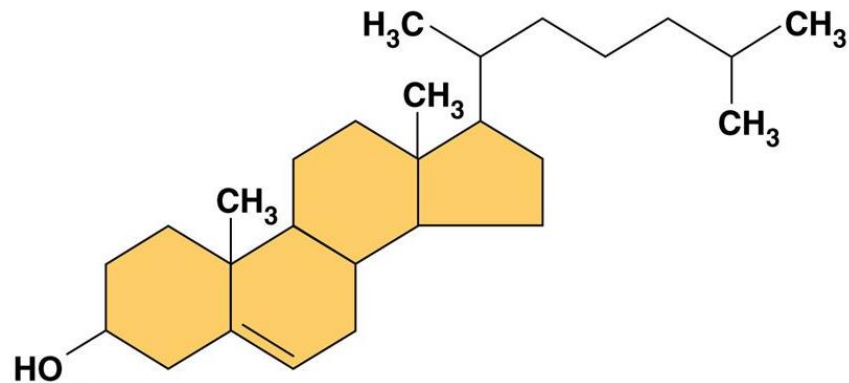
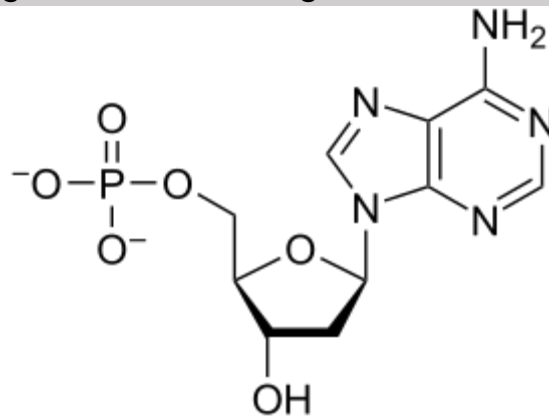


1. Which of the following is true about this figure?



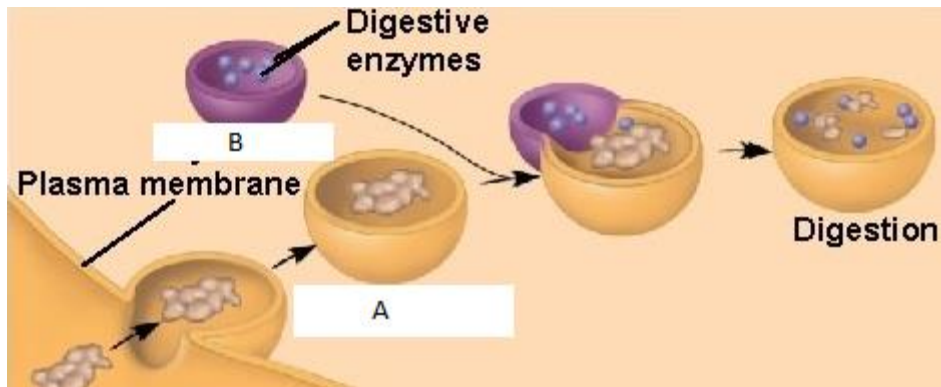
- A. It is a protein
- B. It is involved in the buffering of membrane fluidity
- C. Found only in plant cell membrane
- D. Can be used to make other molecules such as sex hormones
- E. Both B and C correct

2. Which of the following true about this figure?



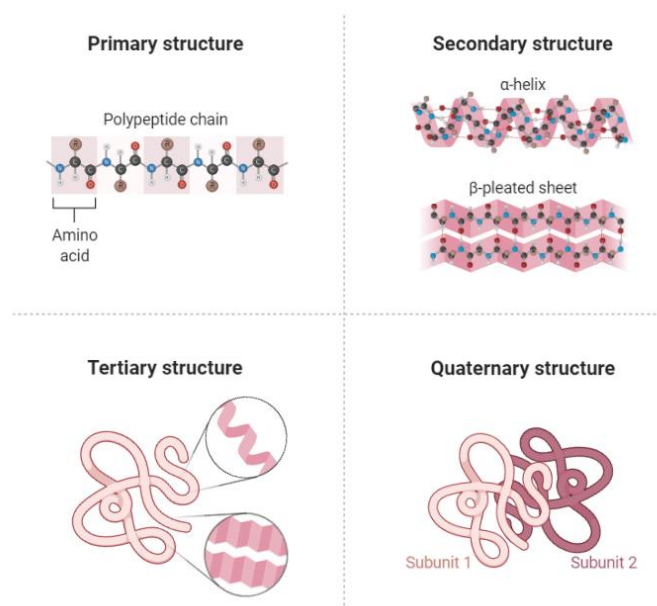
- A. It represents nucleoside
- B. Called nucleotide or nucleoside monophosphate
- C. Can found in both DNA or RNA
- D. Both A and B
- E. Both B and C

3. According to this figure:

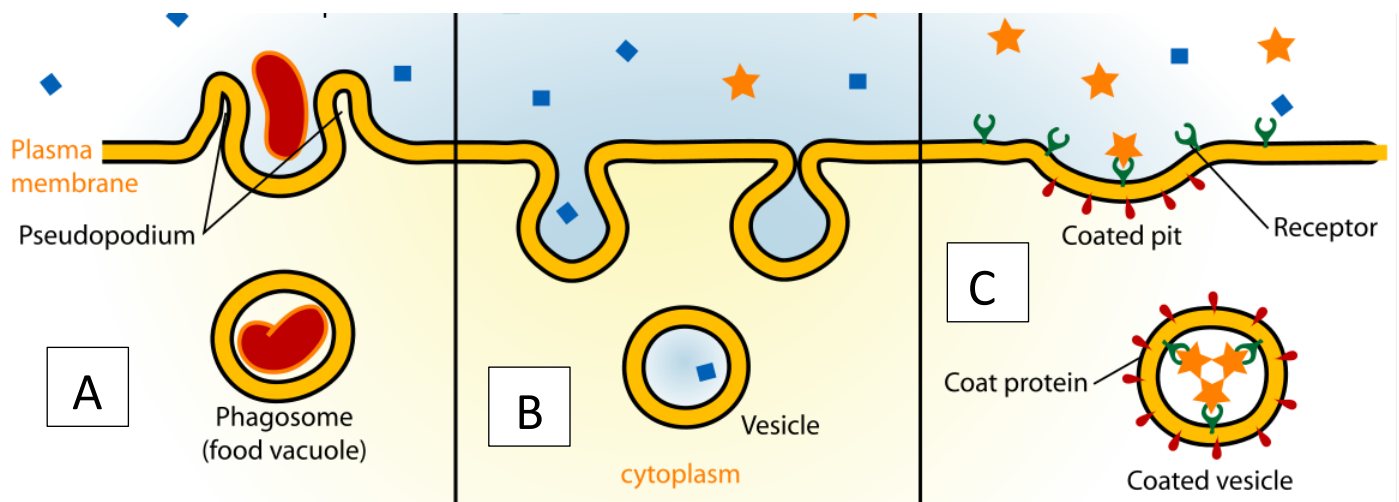


- A. (A) represents: **Food vacuole**, lysosome, damaged organelle
- B. (B) represents: Food vacuole, **lysosome**, damaged organelle
- C. The overall process called: Autophagy, **phagocytosis**, exocytosis
- D. If the enzymes of this organelle are missing or defective, the result could be:
Lysosomal storage disease such as cystic fibrosis
Lysosomal storage disease such as Tay-sachs disease
Alzheimer disease
Parkinson disease
- E. The best PH for the enzymes that found in these organelles: **Acidic**, basic, neutral
- F. Are these organelles part of endomembrane system? **Yes**, NO

4. This figure shows four levels of protein structure, choose the correct one in each statement:



- A. Which level represents linear chain of amino acids joined by peptide bond? **1**
- B. Which level is the least affected by disruption of hydrogen bonds? **1**
- C. Which level represents regions stabilized by hydrogen bonds between backbone? **2**
- D. Which level represents aggregation of two or more polypeptides? **4**
- E. Which level involve the formation of disulfide bridge between two cystine monomers? **3**



5. The figure shows 3 types of endocytosis, choose the correct type in each statement:

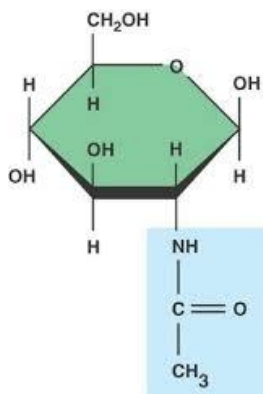
- A. Represent engulfing of particles and formation of food vacuole **A**
- B. LDL can enter the cells by this type **C**
- C. Represents non-specific endocytosis in which droplets of dissolved material enter the cell **B**

6. Which of the following true about this figure?



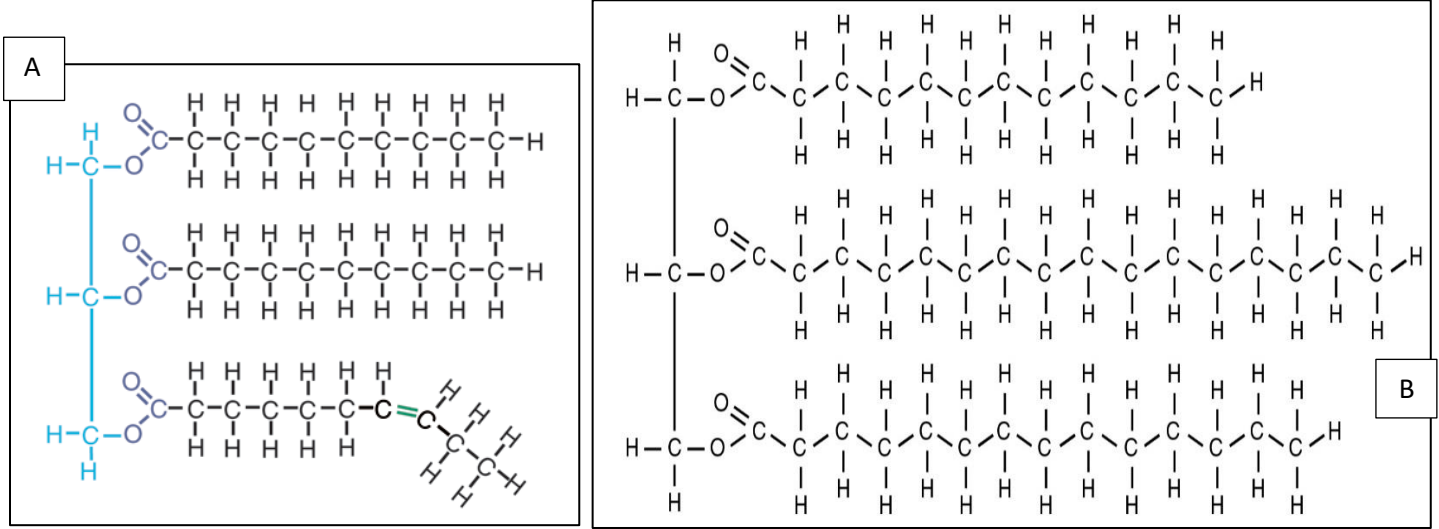
- A. It results from hydrogen bonding between water molecules
- B. It called specific heat
- C. It called surface tension
- D. It results from hydrogen bonding between the water at interface and the air above
- E. Both A and C
- F. Both B and D

7. Which of the following is true about this figure



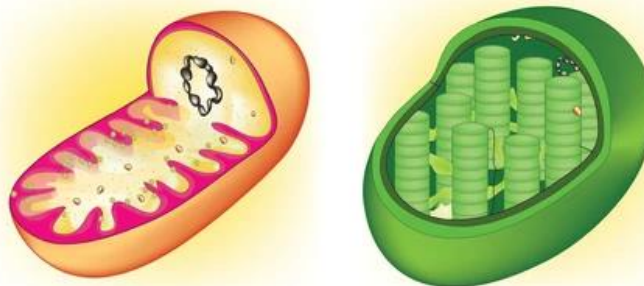
- A. It is alpha glucose that contains nitrogen and found in cellulose
- B. It is beta glucose that contains nitrogen and found in cellulose
- C. It is alpha glucose that contains nitrogen and found in chitin
- D. It is beta glucose that contains nitrogen and found in chitin

8. According to this figure:



- In order to make one of these molecules we need:
 - A. Glycerol – 2 fatty acids and choline
 - B. Glycerol – 2 fatty acids and phosphate
 - C. Addition of 3 water molecules
 - D. Glycerol – 3 fatty acids with removal of 3 water molecules**
 - E. None of the above
- Which of them can be found solid at room temperature? **B**
- Plants fats and oils are examples of which type? **A**

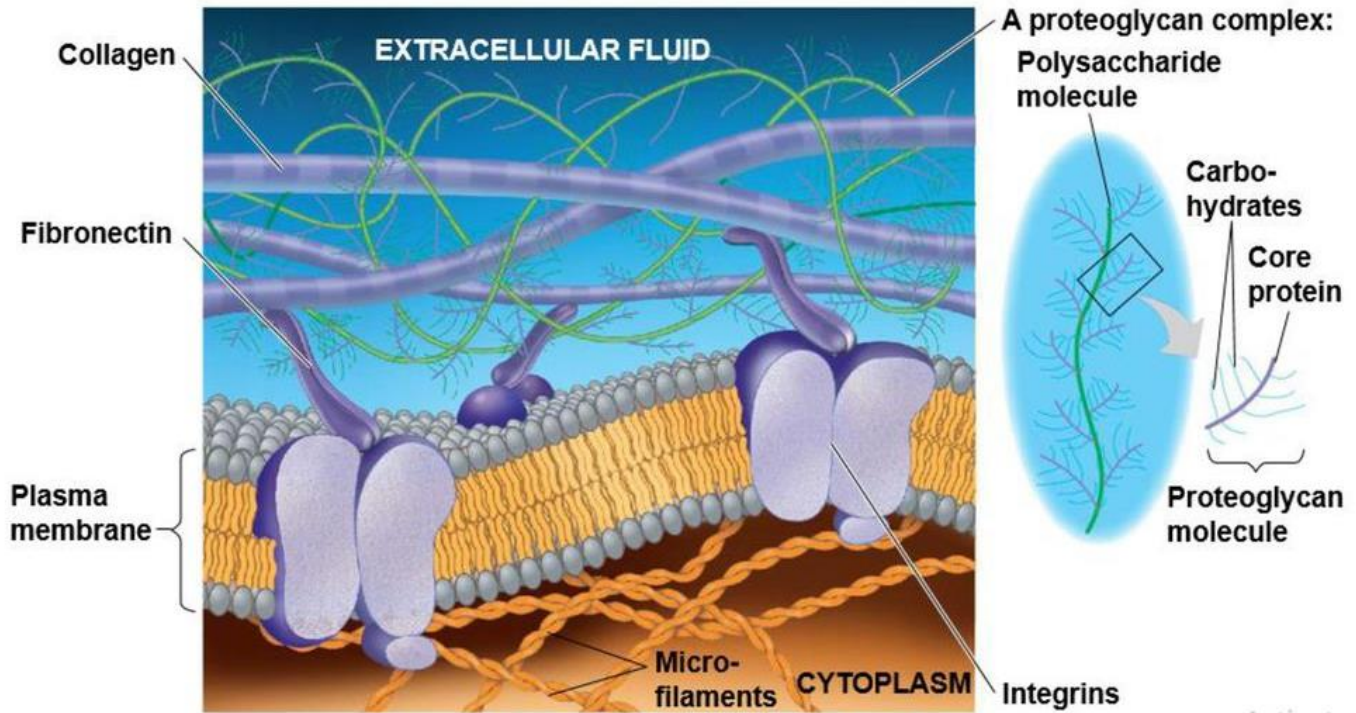
9. Which of the following correct about these organelles?



- A. Both are part of endomembrane system
- B. Both can convert solar energy to chemical energy
- C. Both surrounded by two membranes separated by intermembrane space
- D. Both contains its own DNA, ribosomes and enzyme
- E. Only C and D**
- F. Only A and B

10. Which of the following not part of extracellular matrix (ECM)?

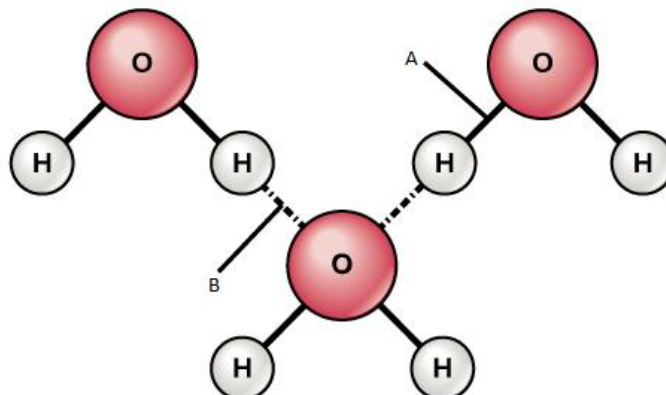
- A. Collagen and integrin
- B. Cellulose and pectin**
- C. Integrin and fibronectin
- D. Collagen and proteoglycan



11. Which of the following is true about middle lamella?

- A. It made of pectin to connect adjacent primary cell walls of plant cells**
- B. It made of cellulose to connect adjacent primary cell walls of plant cells
- C. Its function to maintain the shape of nucleus
- D. None of the above

12. According to this figure:



- A. Which bond represents polar covalent bond? **A** or **B**
 B. Which bond represents hydrogen bonds? **A** or **B**
 C. Each water molecule can form **4 hydrogen bonds** with other molecules.
 D. To vaporize water, which bond must be broken? **A** or **B**

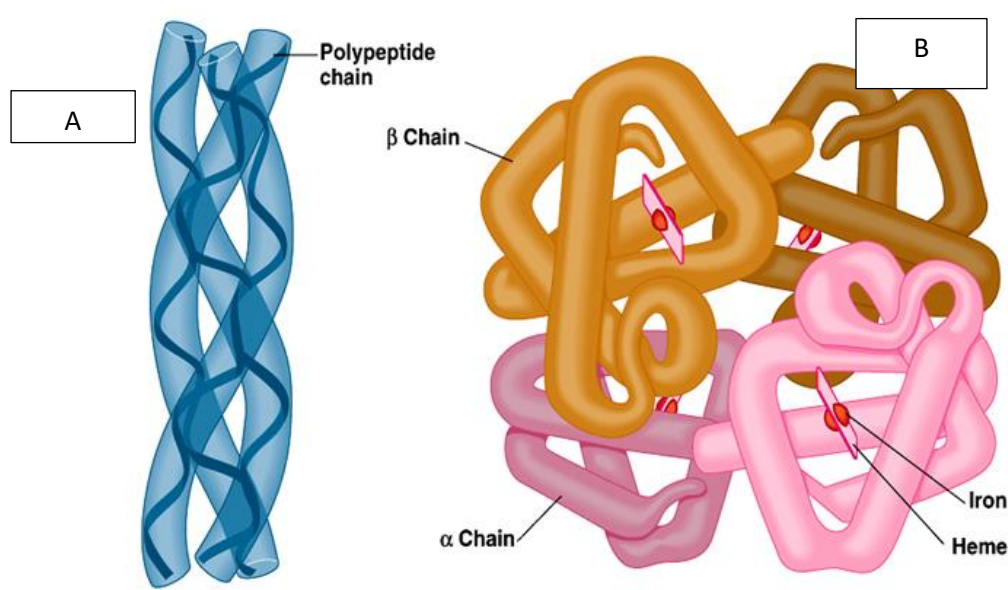
13. Which of the following is a common feature between all cells?

- A. Nucleus
 B. Chromosome
 C. Cell membrane
 D. Cytosol
E. All of the except of A

14. Which of the following is true about nuclear lamina?

- A. It made of intermediate filament
 B. Its function to maintain the shape of nucleus
 C. It is a framework of protein fibers extending through the nucleus
D. Both A and B
 E. Both B and C

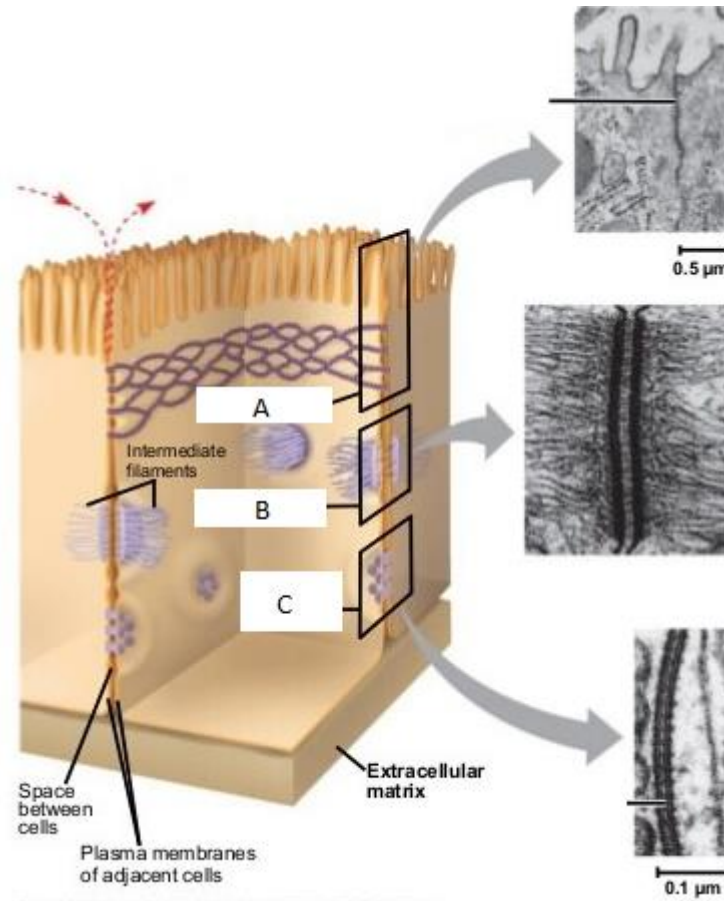
15. According to this figure



- Which of them is a fibrous protein? **A**
- Which of them is a globular protein? **B**

- If there is a change in the primary structure of (B), This will cause a disease known as **Sickle-cell anemia**

16. According to this figure, choose the correct junction between these:

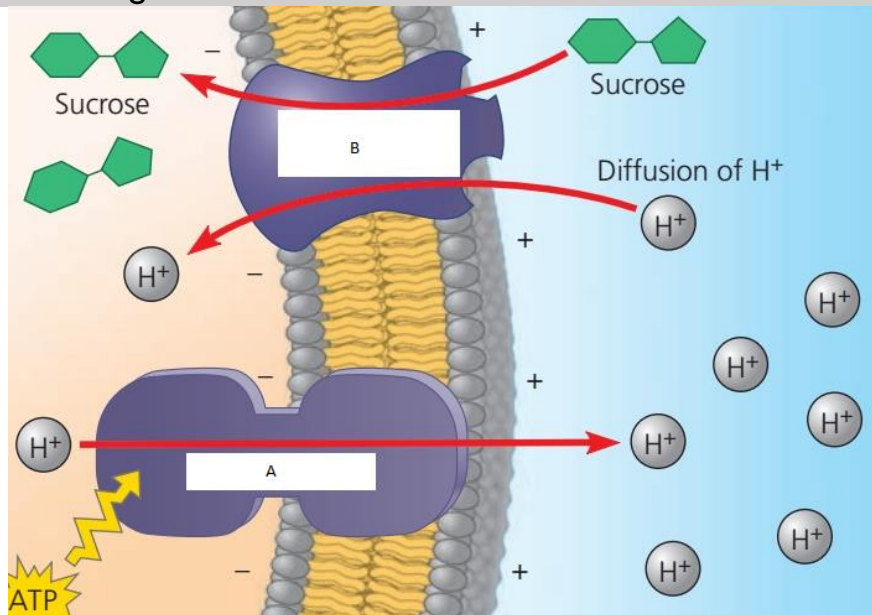


- A. Which of the following prevents leakage of extracellular fluid across a layer of cells? **A**
- B. Which of the following provides cytoplasmic channels from one cell to another? **C**
- C. Plasmodesmata in plant cells is similar to which structure in this figure? **C**
- D. Which of the following anchored to cytoplasm by intermediate filament? **B**

17. Which of the following not function of smooth endoplasmic reticulum?

- A. Storage of calcium ions
- B. Detoxification of drugs and poisons
- C. Making proteins that will be secreted out of the cell**
- D. Metabolism of carbohydrate

18. According to this figure:



- A. (A) represents **proton pump**
- B. (B) represent **H⁺/sucrose cotransporter**
- C. Name these processes **Cotransport**
- D. Major electrogenic pump in animal cells is **Na⁺/K⁺ pump** and in plant cells is **proton pump**
- E. Why it called electrogenic? **Because it contributes in membrane potential**
- F. Voltage across membrane called **Membrane potential**
- G. We need ATP as a source of energy in (**Active** or passive transport)
- H. Water moves quickly across membrane due to **Aquaporins**
- I. CO₂, O₂ and other nonpolar molecules can pass through membrane by **simple diffusion**

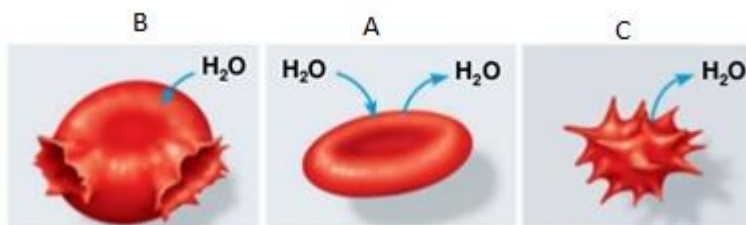
19. About sodium-potassium pump decide whether these statements true or false?

- A. It is an active process requires ATP as a source of energy (**T**)
- B. Pumps 3 sodium ions into the cell (**F**)
- C. Pumps 2 potassium ions into the cell (**T**)
- D. It is major electrogenic pump in plant cells (**F**)

20. Ions diffuse across membrane down there:

- A. Chemical gradient
- B. Electrical gradient
- C. **Electrochemical gradient**
- D. None of the above

21. The figure shows animal cells placed in 3 solutions, choose the correct one:



- A. Which letter represents the normal tonicity of animal cell? **A**
- B. In (C), cell will lose water so it will ----- (**Shrink**, lysed, normal)
- C. The healthy state of plant cell in ----- (**Hypotonic** / Hypertonic/ Isotonic)
- D. What we mean be osmosis? **Diffusion of water molecules form region of high free water concentration to region of low free water concentration**

22. Write the molecular formula of a polymer contains 10 ribose molecules.

23. Solution in which water is the solvent are called

- A. non aqueous solution
- B. aqueous solution**
- C. water solution
- D. None of the above

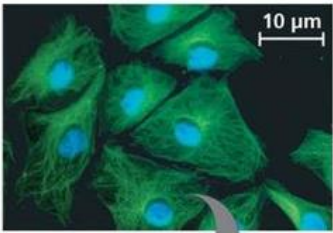
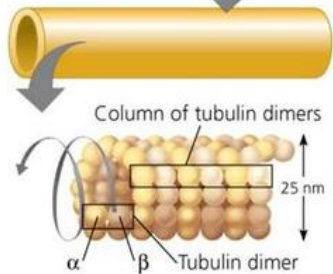
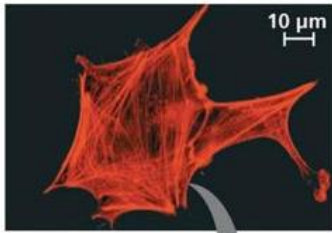
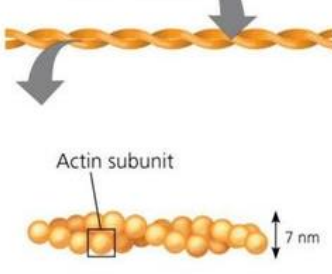
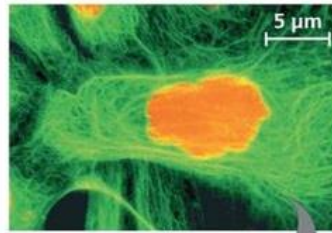
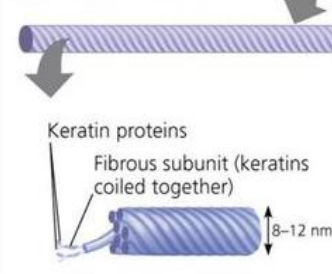
24. Insoluble fibers refer to:

- A. Cellulose**
- B. Chitin
- C. Glycogen
- D. Amylose
- E. None of the above

25. Which of the following mismatched pair?

- A. Nucleolus / Production of ribosomes
- B. Mitochondria / ATP production
- C. Chloroplasts / Photosynthesis
- D. Microtubules / Formation of nuclear lamina**
- E. Lysosome / Intracellular digestion

Table 6.1 The Structure and Function of the Cytoskeleton

Property	Microtubules (Tubulin Polymers)	Microfilaments (Actin Filaments)	Intermediate Filaments
Structure	Hollow tubes	Two intertwined strands of actin	Fibrous proteins coiled into cables
Diameter	25 nm with 15-nm lumen	7 nm	8–12 nm
Protein subunits	Tubulin, a dimer consisting of α -tubulin and β -tubulin	Actin	One of several different proteins (such as keratins)
Main functions	Maintenance of cell shape (compression-resisting "girders"); cell motility (as in cilia or flagella); chromosome movements in cell division; organelle movements	Maintenance of cell shape (tension-bearing elements); changes in cell shape; muscle contraction; cytoplasmic streaming in plant cells; cell motility (as in amoeboid movement); division of animal cells	Maintenance of cell shape (tension-bearing elements); anchorage of nucleus and certain other organelles; formation of nuclear lamina
Fluorescence micrographs of fibroblasts. Fibroblasts are a favorite cell type for cell biology studies. In each, the structure of interest has been tagged with fluorescent molecules. The DNA in the nucleus has also been tagged in the first micrograph (blue) and third micrograph (orange).	 	 	 

26. Which of the following does not contain amino acids?

- A. Insulin
- B. Antibodies
- C. Cholesterol**
- D. Hemoglobin

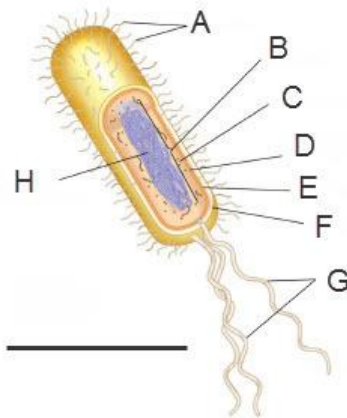
27. About proteins, decide if these statements are correct:

- A. In a polypeptide, amino acids arranged in a branched polymer **F**
- B. We can find hydrophobic amino acids at the surface of a globular protein **F**
- C. Disulfide bridges is a covalent bond responsible of stabilization of secondary level of protein **F**
- D. When the protein loses its native shape, the process called renaturation **F**

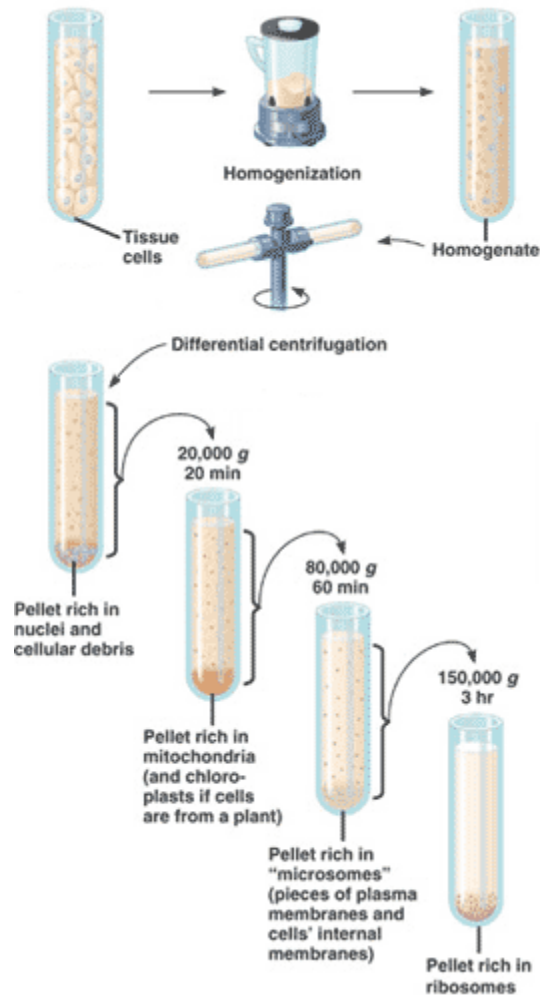
28. Which of the following found only in RNA?

- A. Guanine and ribose
- B. Adenine and deoxyribose
- C. Uracil and deoxyribose
- D. Uracil and ribose**
- E. None of the above

29. Which of the following is false about this figure?



- A. It is a prokaryotic cell with membrane bound nucleus**
- B. It is a bacterium
- C. It is a unicellular organism
- D. Its DNA is located in a non-enclosed region called nucleoid
- E. None of the above



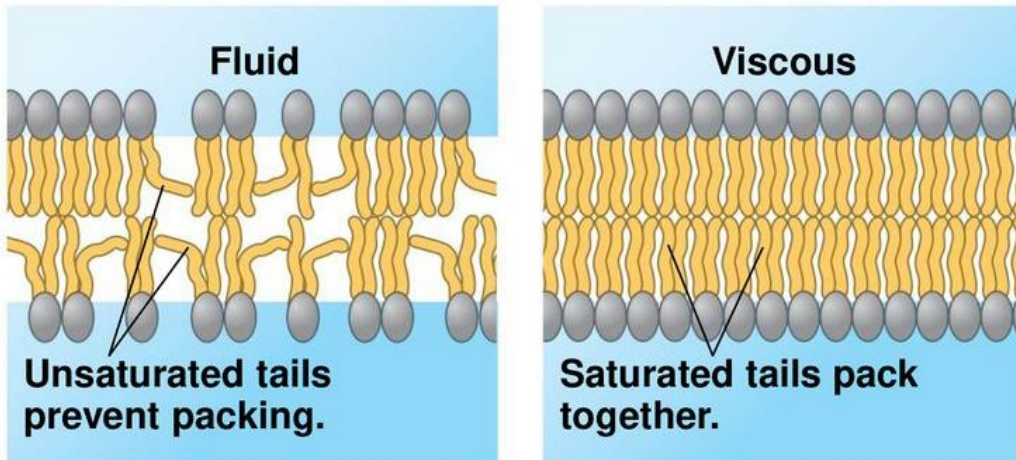
30. About cell membrane (Plasma membrane), which of the following false statement?

- A. The components of cell membrane held together by hydrophobic interaction
- B. Phospholipids can move rapidly by lateral movements
- C. Most proteins are held in place by attachment to cytoskeleton and ECM
- D. There is a high level of cholesterol in cell membrane of plant cells**
- E. Phospholipids represents the main fabric of membrane, while protein determines its function

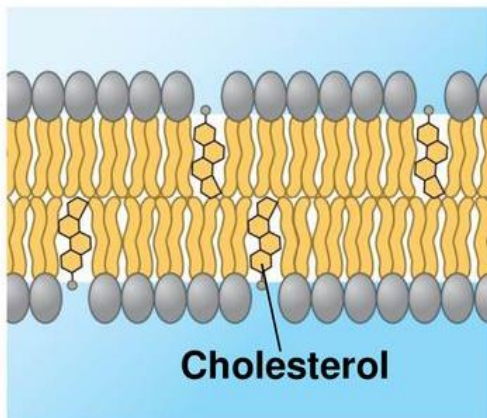
31. Which of the following acts as Fluidity buffer within the membrane?

- A. Cholesterol**
- B. Phospholipids
- C. Proteins
- D. Carbohydrate

Unsaturated versus saturated hydrocarbon tails



Cholesterol within the animal cell membrane



Cholesterol reduces membrane fluidity at moderate temperatures, but at low temperatures hinders solidification.

32. Which of the following molecules involved in cell-cell recognition?

- A. Cholesterol
- B. Carbohydrate**
- C. Phospholipids
- D. Proteins
- E. None of the above

33. About DNA, which of the following is false:

- A. DNA is a double helix
- B. Adenine forms a complementary pairing with thymine by 2 hydrogen bonds
- C. Guanine forms a complementary pairing with cytosine by 3 hydrogen bonds
- D. 3' end contains phosphate while 5' ends contains OH**
- E. DNA can replicate itself

34. Which of the following transporter proteins involved in active transport:

- A. Only channel protein
- B. Only carrier protein**
- C. Both of carrier and channel
- D. There is no need of transporter protein in active transport
- E. None of the above

35. Which of the following is a measure of clarity:

- A. Magnification
- B. Contrast
- C. Resolution**
- D. Both of resolution and contrast
- E. Both of magnification and contrast

36. About microscopes, choose the false statement:

- A. We use TEM to study internal structure of cells
- B. We use SEM to get 3D image
- C. LM uses visible light
- D. In EM we use glass lenses**
- E. We can study living cells with LM

37. The volume enclosed by the plasma membrane of plant cells is often much larger than the corresponding volume in animal cells. The most reasonable explanation for this observation is that

- A. plant cells are capable of having a much higher surface-to-volume ratio than animal cells.
- B. plant cells have a much more highly convoluted (folded) plasma membrane than animal cells.
- C. plant cells contain a large vacuole that reduces the volume of the cytoplasm.**
- D. animal cells are more spherical, while plant cells are elongated.
- E. the basic functions of plant cells are very different from those of animal cells

38. Which of the following is a compartment that often takes up much of the volume of a plant cell?

- A. lysosome
- B. vacuole**
- C. mitochondrion
- D. Golgi apparatus
- E. Peroxisome

39. The Golgi apparatus has a polarity or sidedness to its structure and function. Which of the following statements correctly describes this polarity?

- A. Transport vesicles fuse with one side of the Golgi and leave from the opposite side.
- B. Proteins in the membrane of the Golgi may be sorted and modified as they move from one side of the Golgi to the other.
- C. Lipids in the membrane of the Golgi may be sorted and modified as they move from one side of the Golgi to the other.
- D. Soluble proteins in the cisternae (interior) of the Golgi may be sorted and modified as they move from one side of the Golgi to the other.
- E. All of the above correctly describe polar characteristics of the Golgi function.**

40. Organelles other than the nucleus that contain DNA include

- A. Ribosomes.
- B. mitochondria.
- C. chloroplasts.
- D. B and C only**
- E. A, B, and C

41. Why isn't the mitochondrion classified as part of the endomembrane system?

- A. It only has two membrane layers.
- B. Its structure is not derived from the ER.**
- C. It has too many vesicles.
- D. It is not involved in protein synthesis.
- E. It is not attached to the outer nuclear envelope

42. Which structure is common to plant and animal cells?

- A. chloroplast
- B. wall made of cellulose
- C. central vacuole
- D. mitochondrion**
- E. centriole

43. Which of the following is present in a prokaryotic cell?

- A. mitochondrion
- B. ribosome**
- C. nuclear envelope
- D. chloroplast
- E. ER

44. In what way do the membranes of a eukaryotic cell vary?

- A. Phospholipids are found only in certain membranes.
- B. Certain proteins are unique to each membrane.**
- C. Only certain membranes of the cell are selectively permeable.
- D. Only certain membranes are constructed from amphipathic molecules.
- E. Some membranes have hydrophobic surfaces exposed to the cytoplasm, while others have hydrophilic surfaces facing the cytoplasm.