1. Which scientist coined the term "cell" after observing cork slices under a microscope?
2. Describe the key differences in genetic material between a prokaryotic and a eukaryotic cell.
3. Which of the following statements about prokaryotic cells is false?
4. Compare and contrast the functions of the cell wall in a plant cell versus the cell membrane in an animal cell.
5. What is the significance of the nucleolus within the nucleus?
6. A student observes a cell with a prominent nucleoid region but no other membrane-bound organelles. This cell is most likely from a:
7. A scientist discovers a new type of cell that lacks a cell wall but has chloroplasts. From which type of organism could this cell most likely have been isolated?
8. Which of the following cell components is directly involved in producing spindle fibers during cell division in animal cells?
9. Predict the effect on a plant cell if its central vacuole were to suddenly lose all its water content.
10. Why are some cells, like nerve cells and muscle cells, much longer than typical cells?
11. Explain why cells like paramecium or amoeba, living in freshwater, possess contractile vacuoles.
12. How does the process of osmosis differ from diffusion?
13. If a cell's enzyme responsible for DNA repair is non-functional, what is a potential long-term consequence for the organism?
14. Which of the following processes requires energy from ATP?
15. Which type of cell junction is primarily responsible for preventing leakage of fluid between adjacent epithelial cells in tissues like the stomach lining?
16. Which cellular structure is unique to plant cells and is responsible for their rigidity and protection against osmotic lysis?
17. A scientist discovers a new single-celled organism that thrives in extreme environments, such as hot springs and highly acidic conditions. Which type of cell structure would this organism most likely possess to withstand such harsh conditions?
18. Describe the process of phagocytosis and its importance for certain cells.
19. Compare the function of a plant cell's central vacuole to an animal cell's lysosome.
20. If a cell's DNA is damaged, which organelle is responsible for initiating programmed cell death (apoptosis) to prevent the damaged cell from causing harm to the organism?