What Is Cell Structure?

Worksheet

Cell structure is the arrangement of a cell's components - the plasma membrane, cytoplasm, and organelles such as the nucleus, mitochondria, ribosomes, endoplasmic reticulum, and Golgi apparatus - each performing a distinct function that keeps the cell alive.

Questions

1. Which organelle is known as the 'powerhouse of the cell'?

A) Nucleus
B) Mitochondria
C) Ribosome
D) Golgi apparatus

2. Where does protein synthesis (translation) occur?

A) Nucleus
B) Lysosome
C) Ribosome
D) Cell membrane

3. What is the main function of the Golgi apparatus?

A) Store DNA
B) Produce ATP
C) Package and sort proteins
D) Digest waste

4. Which organelle breaks down waste and damaged cell parts?

A) Ribosome
B) Lysosome
C) Nucleus
D) Golgi apparatus

5. A pancreas cell needs to produce and secrete insulin. Which organelles are involved, in order?

6. A muscle cell needs a large, constant supply of ATP for contraction. Which organelle provides this, and why is it abundant?

7. A white blood cell must break down and recycle old or damaged proteins. Which organelle handles this, and what happens if it fails?

8. Define: What is the function of the nucleus?

9. Define: What do mitochondria do?

10. Define: What is the role of ribosomes?

Answer Key

1. B) Mitochondria - Mitochondria produce ATP through cellular respiration.

2. C) Ribosome - Ribosomes translate mRNA into a chain of amino acids to build proteins.

3. C) Package and sort proteins - The Golgi apparatus modifies, packages, and sends proteins to their destination.

4. B) Lysosome - Lysosomes contain digestive enzymes for breaking down cellular waste.

5. Nucleus: DNA for insulin is transcribed into mRNA Ribosome (on rough ER): mRNA is translated into the insulin protein Rough ER: the protein folds into its correct shape Golgi apparatus: insulin is packaged into vesicles Vesicle: fuses with the cell membrane and releases insulin outside the cell

6. Mitochondria convert glucose and oxygen into ATP through cellular respiration Muscle cells contract constantly, requiring huge amounts of energy Muscle cells therefore contain far more mitochondria than, say, skin cells This matches organelle abundance to the cell's function

7. Lysosomes contain digestive enzymes that break down waste and damaged organelles They fuse with the material to be broken down and digest it If lysosomes fail (as in Tay-Sachs disease), waste builds up inside the cell This shows why proper organelle function is essential to cell health

8. Stores the cell's DNA and controls gene expression by producing mRNA.

9. Produce ATP (energy) for the cell through cellular respiration - the 'powerhouse of the cell'.

10. Translate mRNA into proteins; found free in the cytoplasm or attached to the rough ER.