Introduction to Cell â?? Structure and Type

Description

Understanding the intricacies of cell structure and types is paramount for students gearing up for government exams due to its broad applicability in various fields such as biology, medicine, and agriculture, all of which are often tested in these exams. A solid grasp of cellular organization, organelle functions, and cell types not only forms the basis of biological concepts but also aids in comprehending complex topics like genetics, immunology, and environmental science, which are frequently featured in government exam syllabi.

Introduction to Cell â?? Structure and Type

Cytology

In this branch, the structure and function of cells are studied. **Â The word cell** was given by Hertwig.
Cells were discovered by Robert Hooke; he saw dead cells in corks. Therefore, **Robert Hooke isÂ called the** father of cytology.

1. A. V. Leeuwenhoek **was the first** to look at living cells.
   During evolution, the first cells wereÂ formed by an abiotic process or chemical synthesis.

Cell Theory â??

1. Cell Theory presented by **Maltheus Schelden** and **Theodore Schwann**. According to this, the cell is the functional, structural and hereditary unit of life.
2. **Rudolf Virchow** has said that new cells are formed from already existing cells.
3. The cell principle is â??
   (a) All living organisms are made up of cells and the product of cells.
   (B) All cells arise from pre-existing cells.

Exceptions to cell theory

Â B and T lymphocytes â?? typical genetic material is absent.

Â Multi Nucleate Organism: â?? Syncytium **in animals**, coenocyte in plants, slime moulds in Plimodium.

Â Prions: â?? Only nucleicÂ acids made by proteins are absent.

RBC: â?? Nucleus absent (nucleus is present in the RBC of camel and llamom)
Virus: â?? Acellular, Â Â composed only of nucleic acids and Â

proteins.
Viriods:- There is only RNA particles.
Virions:- are passive carriers of the viral genome.

Â Cell Size:-

Mycoplasma:- Smallest cell, 0.3 micrometer in length
Bacteria: â?? 3-5 micrometers
in length Human RBCs: â?? 7 micrometers
Nerve Cell: – Longest cell, 90cm in length

Boemeria nivea: â?? Longest plant cell

Acetabularia: â?? Longest unicellular plant
ostrich egg- largest single cell

Cell Shape: â??

The cells are disc-like, polygonal, columnar, cuboid, threads similar or irregular.

Type of cell: â??

1. **B. Van Neil** classified cells into two classes:
2. **Prokaryotic cell:**
3. The cells of bacteria, blue green algae, mycoplasma (cell wall absent), PPLO (organisms like Pleuro pneumoniae) etc. are prokaryotic cells.
4. The nucleus is less developed called nucleiod, it lacks histone proteins.
5. Membrane ligaments lack cells.
6. THE OUTERMOST OF THE CELLS IS GLYCOCALYX MADE OF POLYSACCHARIDES IN THE FORM OF HARD CAPSULES AND SOFT COATINGS (SLIME LAYER SLIME LAYER).
7. Cell walls are made up of peptidoglycan.
8. PLASMA MEMBRANES ARE MADE UP OF FATS, PROTEINS AND OLIGOSACCHARIDES.
9. Bacteria are of gram + ve and gram â??ve
10. THE MESOSOME IS FORMED BY THE INGESTION OF THE PLASMA MEMBRANE. On which there are enzymes for respiration.
11. IN ADDITION TO GENOMIC DNA, SINGLE CIRCULAR DNA IS CALLED PLASMID.
12. Bacterial cells are motile or amotile.
13. FLAGELLUM â?? CONSISTS OF THREE PARTS â?? FILAMENT, HOOK, AND BASAL BODY
14. PILI AND FIMBRIAE â?? DO NOT PLAY A ROLE IN MOBILITY. But it helps to stick.
15. RIBOSOMES 15-20nm, divided into 2 sub-units 50s and 30s -70s together â??
16. Ribosomes aid in protein synthesis.
17. RNA+Ribosomes â??>POLYRIBOSOMES POLYSOMES
18. INCLUSION BODIES: PHOSPHATE GRANULES, CYANOPHYCIN, GLYCOGEN GRANULES, GAS VACUOLES.
19. **Eukaryotic Cell**
20. EU-developed, Karyon-
21. They contain developed nucleus.
22. They contain one or more nucleus.

23. Their genetic material is arranged in chromosomes.
24. **It** consists of membrane ligament cells.
25. All plants, animals, fungi, protists contain eukaryotic cells.
26. There is also a difference between plant and animal cells.

Difference Between Prokaryotic and Eukaryotic Cells

S.No.	symptom	Prokaryotic cell	Eukaryo
1.	Example	Bacteria , Cyanobacteria , Mycoplasma	Algae , fu
2.	Cell Size	Micro 0.1-5 um diameter	Large 5-2
3.	Cell wall manufactured.	Made from mucopeptides (peptidoglycones)	From wal
	Satanga		
	(i)E.R.	Â Â Â Â Â Â Â Â not present	Well-dev
	(ii) Mitochondria	not present	
	Â		Present in
	(iii) Plaque	not present	Plants on
4.			
			Functions
			Synthesis
	(iv) Goljikaya	not present	Well deve accumula
	(v) Lysosomes and paraoxisomes	not present	Present, f
	(vi) Microtubules	not present	Present, F
	(vii) Ribosomes	Present, 70 types, function protein synthesis	Present 8

	nucleus		
	(i) Centrifugal art	not present	Present D
	Â		
	(ii) Centralized	not present	Synthesis In centrif
5.			
	(iii) Genetic material	Scattered in the cytoplasm	Bound
	(iv) Histone protein	not present	present
	(v) Multiplication	Always haploid	Haploid a
6.	Stellar	not present	Present in
7.	Misdeeds	Paramicrobe, made up of a fibril in the bacteria present	Subtle, w
8.	Cell division	Misotic and meiosis divisions are notÂ there, chromatic divisions are non-formulaic divisions. Movement of chromosomes unknown | Rational fibers are not formed.	There are movemen formed.
9.	Sexual reproduction	True Sexual Reproduction Absent	Sexual re
10.	Protoplasm	Thin	The mem
11.	breathing	Often by non-aerobic respiration, by plasma membrane	Aeration

Â

Difference between Plant Cell and Animal Cell

S.No.	Plant Cell	Animal Cell
1.	The cell wall is present.	The cell wall is absent.
2.	Â Vacuole usually causes the nucleus to be at the periphery.	Nucleus is present near the centre i
3.	In higher plant cells, the stellate (centosome) is usually absent. The exception is low-grade motile cells.	Generally, the stellar body is prese spindle fibir.
4.	Plastids are present. Fungi are an exception to this.	Plastids are absent .
5.	Mitochondria are spherical or elliptical in shape.	Mitochondria are tubular .
6.	A long nuclear vacuole is present.	There are many rituals which are p
7.	During cell division, cytoplasm is normally divided by the cell plate method.	The cytoplasm divides by groove a
8.	Plant cells are capable of producing all amino acids, coenzymes and vitamins.	Animal cells cannot produce all am
9.	Contractile vacuoles are not found in them.	Contractile vacuoles can be found i water.
10.	The spindle formation after cell division is of the anastral type.	The spindle formation during cell d
11.	Lysosomes are present in small numbers.	Lysosomes are present in greater n
12.	Spherosome is present.	There is a lack of spherosomes.
13.	The stored food is in the form of starch.	The stored food is in the form of gl
14.	Plasmodesmata are found .	Plasmodesmata are lacking.

Category

1. Biology Topic Wise Notes in English

Tags

1. Introduction to Cell â?? Structure and Type

Date
2024/12/22
Date Created
2024/03/29
Author
firstcareer-in