

NEET Biology: Cell — The Unit of Life

Quick revision notes · Class 11 Biology (NCERT) · NEET UG · Biology

1. Cell theory

- Matthias Schleiden (1838, plants) and Theodor Schwann (1839, animals) proposed that all living organisms are made of cells.
- Rudolf Virchow (1855) added: new cells arise from pre-existing cells — "Omnis cellula-e cellula".
- Modern cell theory: all living organisms are composed of cells and their products; all cells arise from pre-existing cells.

2. Prokaryotic vs eukaryotic cells

Feature	Prokaryotic	Eukaryotic
Nucleus	No nuclear membrane (nucleoid)	True nucleus with nuclear envelope
Membrane-bound organelles	Absent	Present
Ribosomes	70S (50S + 30S)	80S (60S + 40S) in cytoplasm
Examples	Bacteria, blue-green algae, mycoplasma	Protists, plants, fungi, animals
Special structure	Mesosome (infolding of cell membrane)	Endomembrane system

3. Cell membrane and cell wall

- Fluid mosaic model: Singer and Nicolson (1972). Lipid bilayer with proteins; quasi-fluid nature allows lateral movement.
- The human RBC membrane has about 52% protein and 40% lipids.
- Plant cell wall: cellulose, hemicellulose, pectins and proteins. Fungal cell wall: chitin. Middle lamella: mainly calcium pectate.

4. Organelles at a glance

Organelle	Key facts
Nucleus	Discovered by Robert Brown (1831). Nucleolus is the site of rRNA synthesis.
Mitochondria	Double membrane; inner membrane forms cristae; own circular DNA and 70S ribosomes; site of aerobic respiration ("powerhouse").
Endoplasmic reticulum	RER: protein synthesis (ribosomes attached). SER: lipid and steroid synthesis.
Golgi apparatus	Described by Camillo Golgi (1898). Packages materials; site of glycoprotein and glycolipid formation.

Organelle	Key facts
Lysosomes	Membrane-bound vesicles with hydrolytic enzymes, active at acidic pH.
Ribosomes	Observed by George Palade (1953). Made of RNA and protein; no membrane.
Plastids	Chloroplasts (photosynthesis), chromoplasts (colour), leucoplasts (storage).
Centrosome	Two centrioles with a 9 + 0 "cartwheel" arrangement of triplet microtubules.
Cilia / flagella	Axoneme with a 9 + 2 arrangement of microtubules.

5. Chromosomes by centromere position

- Metacentric: centromere in the middle, two equal arms.
- Sub-metacentric: centromere slightly away from the middle.
- Acrocentric: centromere close to one end.
- Telocentric: centromere at the terminal end.

★ NEET tip: questions on "who discovered what" and the 70S/80S ribosome split appear almost every year. Revise the organelle table twice.

Quick check

Q1. Which organelle is the site of rRNA synthesis?

Answer: Nucleolus.

Q2. Ribosomes of prokaryotes are of which type?

Answer: 70S (50S + 30S).

Q3. Who proposed the fluid mosaic model?

Answer: Singer and Nicolson, 1972.

Q4. The arrangement of microtubules in a cilium is:

Answer: 9 + 2.

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