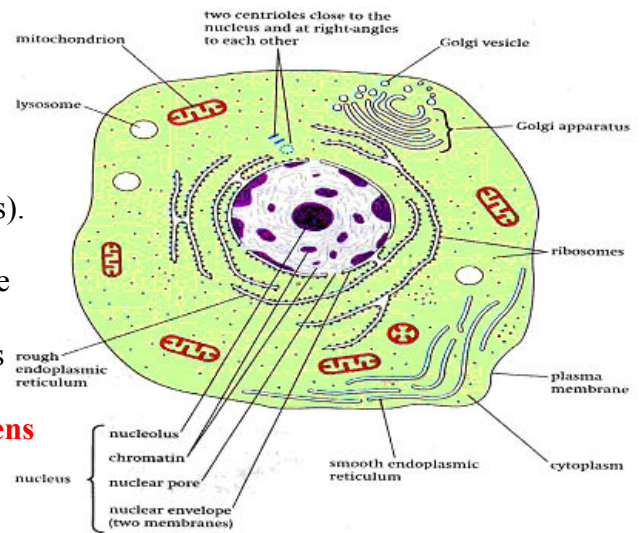


The Cell



Membranes: 'fluid mosaic' structure with **phospholipids** (hydrophilic phosphate head, 2x hydrophobic fatty acid tails). All membranes have same basic structure.

Unsaturated fatty acids (C=C bonds) make membranes more fluid, thus found in plants and fish

Proteins embedded in it: hormone receptors, carrier proteins (facilitated diffusion/active transport) or enzymes.

Carbohydrate 'tree-like' tails on **outside only** – form **antigens**

In decreasing size order (when centrifuged!):

Nucleus: contains DNA (chromosomes) and RNA. **Nucleolus:** site of mRNA & ribosome synthesis.

Nuclear body: prokaryotes only – site of cccDNA (=loop).

Nuclear envelope: (2 x membranes) links to e.r. Has large holes – **nuclear pores**, allows mRNA out

Chloroplast: Site of P/S; has 2 x membranes, 70s ribosomes and cccDNA.

Learn: starch grains, thylakoid, grana, stroma.

Mitochondria: Site of **aerobic respiration**; has 2 x membranes, 70s ribosomes and cccDNA.

Learn: cristae, matrix. **Learn:** more mitos = more respiration = more ATP!

Lysosome: Contains **proteolytic enzymes** to recycle molecules in cell. Causes cell death '**autolysis**'

Endoplasmic reticulum. A **transport system** within the cell – comes in 2 types:

Smooth e.r.: synthesises steroid hormones & proteins for secretion; folded = Golgi body

Rough er: **synthesis of proteins** (80s ribosomes). Commonest in liver, glands

Ribosomes: **site of protein synthesis.** **70s** in mitos, chloroplasts, Prokaryotes. **80s** in Eukaryotes

Golgi body: site of vesicle synthesis, the last stage of secretion before **exocytosis** (secretion)

Centrioles: two sets of 9+2 fibres. Divides to form the **spindle** just before mitosis/meiosis

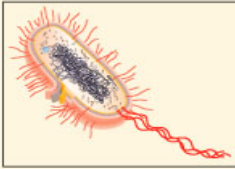
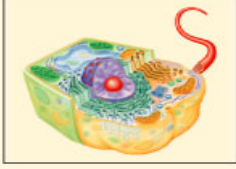
Cilia/flagellae: movement – found in Prokaryotes and Eukaryotes

cilia, short, many. In trachea, bronchi, Fallopian tubes; beat in a **metachronal rhythm**.

flagellae, long, few, sperm tails.

Cell wall; Fully permeable; **cellulose** (plants); **chitin** (fungi); **murein** (bacteria); **none** (animals)

Capsule; pili; nuclear body: found in prokaryotes **only**

Characteristic	Prokaryotic	Eukaryotic
		
Size of cell	Typically 0.2–2.0 μm in diameter	Typically 10–100 μm in diameter
Nucleus	No nuclear membrane or nucleoli	True nucleus, consisting of nuclear membrane and nucleoli
Membrane-enclosed organelles	Absent	Present; examples include lysosomes, Golgi complex, endoplasmic reticulum, mitochondria, and chloroplasts
Flagella	Consist of two protein building blocks	Complex; consist of multiple microtubules
Glycocalyx	Present as a capsule or slime layer	Present in some cells that lack a cell wall
Cell wall	Usually present; chemically complex (typical bacterial cell wall includes peptidoglycan)	When present, chemically simple
Plasma membrane	No carbohydrates and generally lacks sterols	Sterols and carbohydrates that serve as receptors present
Cytoplasm	No cytoskeleton or cytoplasmic streaming	Cytoskeleton; cytoplasmic streaming
Ribosomes	Smaller size (70S)	Larger size (80S); smaller size (70S) in organelles
Chromosome (DNA)	Single circular chromosome; lacks histones	Multiple linear chromosomes with histones arrangement
Cell division	Binary fission	Mitosis
Sexual reproduction	No meiosis; transfer of DNA fragments only	Involves meiosis