

Nucleus

- Contains coded genetic information in the form of DNA molecules
- DNA directs the synthesis of all proteins required by the cell.
- DNA is contained within a **nuclear envelope** to protect it from damage in the cytoplasm.
- Nuclear envelope contains **nuclear pores** that allows the molecules to move into and out of the nucleus.
- DNA associates with **histones** to form a complex called **chromatin**.
- Chromatin coils and condenses to form structures known as **chromosomes**.

Cytoskeleton

Cytoskeleton

- Present throughout the cytoplasm of all eukaryotic cells.
- Network of fibres necessary for the shape and stability of a cell.
- Holds organelles in place and controls movement.

Microfilaments

- First component of the cytoskeleton.
- Contractile fibres formed from the protein actin.
- Responsible for cell movement and contraction during cytokinesis.

Microtubules

- Globular tubulin proteins polymerise to form tubes that are used to form a scaffold-like structure that determines the shape of a cell.
- Act as tracks for the movement of organelles around the cell.
- Spindle fibres are composed of microtubules.

Intermediate Fibres

- Give mechanical strength to cells and help maintain their integrity.

Nucleolus

- Responsible for producing ribosomes.
- Composed of **proteins** and **RNA**.
- RNA is used to produce **ribosomal**

Mitochondria

- Site of final stages of cellular respiration.
- Forms ATP.
- Double membrane organelle.
- Has a structure called **cristae** which is folded.
- Has a fluid interior called the **matrix**.
- Membrane which forms the cristae contains enzymes needed for respiration.
- Contains mtDNA (aka mitochondrial DNA.)

Centrioles

- A component of the cytoskeleton.
- Composed of microtubules.
- 2 associated centrioles form the centrosome, which is involved in the assembly and organisation of the spindle fibres during cell division.

Vesicles and Lysosomes

Vesicles

- Membranous sacs whose purpose is to store and transport.
- Consist of a single membrane with fluid inside.
- Used to transport materials inside the cell.

Lysosomes

- Specialised forms of vesicles that contain hydrolytic enzymes.
- Responsible for breaking down waste material in cells, including old organelles.
- Very important in the immune system as they are responsible for phagocytosis.

Flagella and Cilia

- Both flagella (whip-like) and cilia (hair-like) are extensions that protrude from cell types.

Flagella

- Used primarily to enable cells motility.
- Sometimes used as a sensory organelle