

## KEY WORDS

**biomolecule:** smallest unit an organism can be divided into

**multicellular:** containing more than one cell

**eukaryote:** organism made of cells that have a nucleus

**heterotrophic:** obtaining nutrition from compounds that already exist

**organelle:** special compartment inside a eukaryotic cell that performs a specific function

## 1 From cells to organisms

Human beings are living things.

- They are composed of chemical substances called **biomolecules**.
- They are made up of cells.
- They perform the three vital functions of all organisms: nutrition, reaction to stimuli and reproduction.

Our body is a **multicellular** organism. It is made up of many cells, which have different structures and functions.

Human beings are animals, because:

- They are **eukaryotes**.
- Their nutrition is **heterotrophic**.

Cell theory is based on the following series of principles:

- A cell is the structural and functional unit in all living things.
- All our cells come from successive divisions of one initial cell, a fertilised egg cell called the zygote.

The cell is the basic structural and functional unit of an organism.

The cells in our body come in very different shapes and sizes, but they all share the same basic structure.

- **Cell membrane.** A fine layer that separates the cell from the outside environment and allows substances to enter and leave.
- **Cytoplasm.** Jelly-like substance inside the cell, which contains many types of organelle and where the majority of the vital chemical functions take place.
- **Nucleus.** A structure containing the genetic material with the necessary information to direct and control the cell's functions.

**Mitochondria.** These have a double membrane and produce energy through cell respiration.

**Vacuoles.** Membrane-bound vesicles that store different substances.

**Lysosomes.** Membrane-bound vesicles that contain digestive enzymes. They carry out the digestion of large molecules or old organelles.

**Cytoskeleton.** Protein filaments that form complex networks. They maintain the shape of the cell and are involved in organelle movement in cell division.



**Ribosomes.** Small organelles with no membrane, made up of RNA and proteins. They are scattered throughout the cytoplasm or are attached to the rough endoplasmic reticulum. They synthesise proteins.

**Endoplasmic reticulum.** A membrane system that forms a network of tubules and bags. There are two types:

- **Rough.** It has ribosomes on the outside of its membranes. It synthesises and stores proteins.
- **Smooth.** It has no ribosomes. It synthesises fats and destroys toxic substances.

**Golgi apparatus.** A membranous organelle formed by flattened stacked pouches (cisternae). It takes proteins manufactured in the endoplasmic reticulum to where they are used.

**Centrioles.** Cylinders formed by tubules that direct the movement of the cilia and flagella. They are also responsible for delivering genetic material during cell division.

