

Cell

The smallest living units of the body

- Cell (plasma) membrane = The outer “skin” of the cell
 - √ Composed of phospholipids and some cholesterol
 - √ Receptors and membrane transport proteins are found in the membrane

- Cytoplasm = The fluid that fills the cell
 - √ Mostly water with dissolved ions and molecules
 - √ Organelles (tiny functional structures that keep the cell alive) float in the cytoplasm

- Nucleus = The location of the DNA (the cell’s genetic material)
 - √ The nucleus is enclosed in its own a membrane
 - √ Chromosomes = Long pieces of DNA in the nucleus

[Figs 3.3, 3.4, and 3.13](#)

Metabolism

The sum of all chemical reactions occurring inside an organism

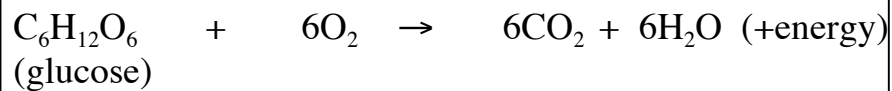
- All metabolic reactions are performed by enzymes
- Catabolic reactions = Metabolic reactions in which larger molecules are broken down into smaller molecules.
- Anabolic reactions = Metabolic reactions in which smaller molecules are joined to form larger molecules.
- ATP supplies the energy for metabolism

[Figs 1.6 and 24.2](#)

Cellular aerobic respiration

A process by which cells obtain energy (to recharge their ATP) by using oxygen to break down glucose

- Cells import O₂ and glucose from the blood
- The glucose is broken down into carbon dioxide and water using the O₂



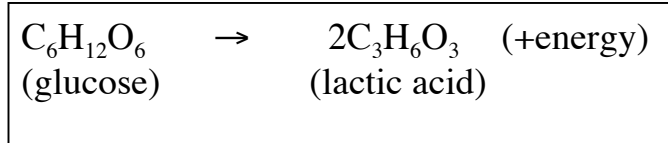
- Recharges 32 ATP per glucose molecule
 - √ Fats and amino acids can also be broken down for energy
- CO₂ and other cellular wastes are exported from the cell into the blood

Figs 24.2 and 24.3

Cellular anaerobic respiration

A process by which certain cells can obtain energy (to recharge their ATP) by breaking down glucose **without using oxygen**

- Each glucose is broken down into two molecules of lactic acid



- Recharges only 2 ATP per glucose molecule

√ Much less energy efficient than aerobic respiration

Figs 24.2 and 24.3