

➤ **Comparison between eukaryotic and prokaryotic cells.**

Characteristic	Prokaryotic cell	Eukaryotic cell
1. Size	Small (generally 1–10 µm)	Large (generally 10–100 µm)
2. Cell membrane	Cell is enveloped by a rigid cell wall	Cell is enveloped by a flexible plasma membrane
3. Subcellular organelles	Absent	Distinct organelles are found (e.g. mitochondria, nucleus, lysosomes)
4. Nucleus	Not well defined; DNA is found as nucleoid, histones are absent	Nucleus is well defined, surrounded by a membrane; DNA is associated with histones
5. Energy metabolism	Mitochondria absent, enzymes of energy metabolism bound to membrane	Enzymes of energy metabolism are located in mitochondria
6. Cell division	Usually fission and no mitosis	Mitosis
7. Cytoplasm	Organelles and cytoskeleton absent	Contains organelles and cytoskeleton (a network of tubules and filaments)

● **The Cell Theory states that:**

- All living organisms are composed of cells, whether they are unicellular or multicellular.
- The cell is the basic unit of life. They are made of preexisting cells.
- Energy flow occurs within cells.
- Heredity information (DNA) is passed from a cell to another.
- All cells have the same basic chemical composition.

● **German chemist Carl Neuberg coined the word “Biochemistry” in 1903.**

● **French chemist Antoine Laurent Lavoisier (Antoine-Laurent de Lavoisier) is hailed the father of modern chemistry. (1743-1794)**

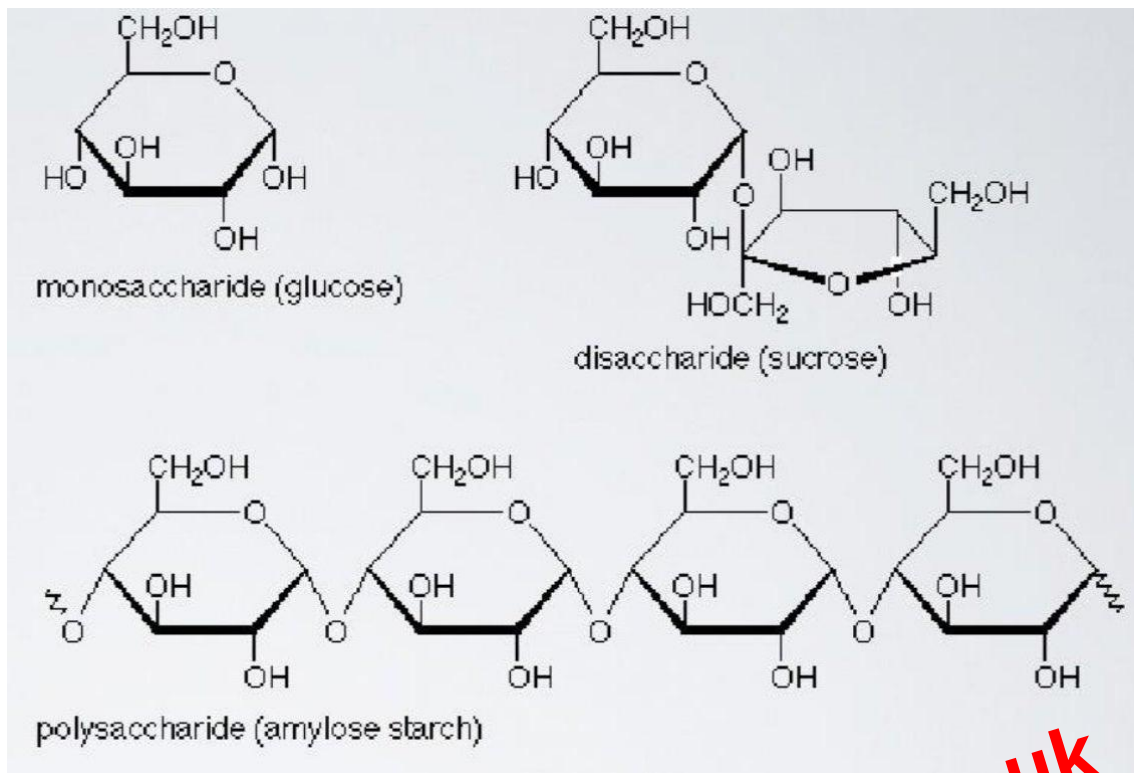
● **Biochemistry is a branch of science, important in the field of biochemical research; it helps in several subjects of agriculture, medical science, and nutrition.**

- It helps in understanding biology at a molecular level, offering a variety of techniques critical for biomedical and agricultural research.
- It made significant contributions in finding and understanding the DNA structure.
- It is classified into categories like:
 - ✧ **Agricultural Biochemistry**
 - ✧ **Animal Biochemistry**
 - ✧ **Plant Biochemistry**
 - ✧ **Industrial Biochemistry**

● **Biochemistry is essential in medicine, as:**

- It is a guide to drug discovery and application (European Federation for Medicinal Chemistry).
- It helps us understand biochemical changes and related physiological alterations in the body; the pathology of each and every disease is studied through biochemical changes.

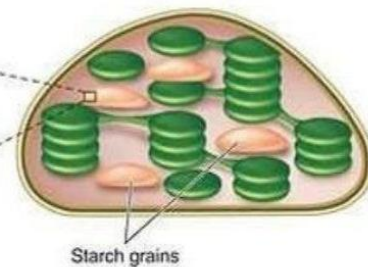
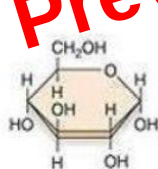
- iii. **Cellulose** — basic plant component; people cannot digest cellulose, but when we eat fiber-rich food (cellulose), the movement of food in the digestive tracts is sped up.



MONOMER

POLYMER

CELL STRUCTURE



**sugar
chloroplasts**

starch

starch grains in

- ✓ Carbohydrates monomers are called monosaccharides.
- ✓ Monosaccharides combine to form larger chains called polysaccharides.