Carbohydrates

An overview of the basic structure and functions of carbohydrates in biochemistry.

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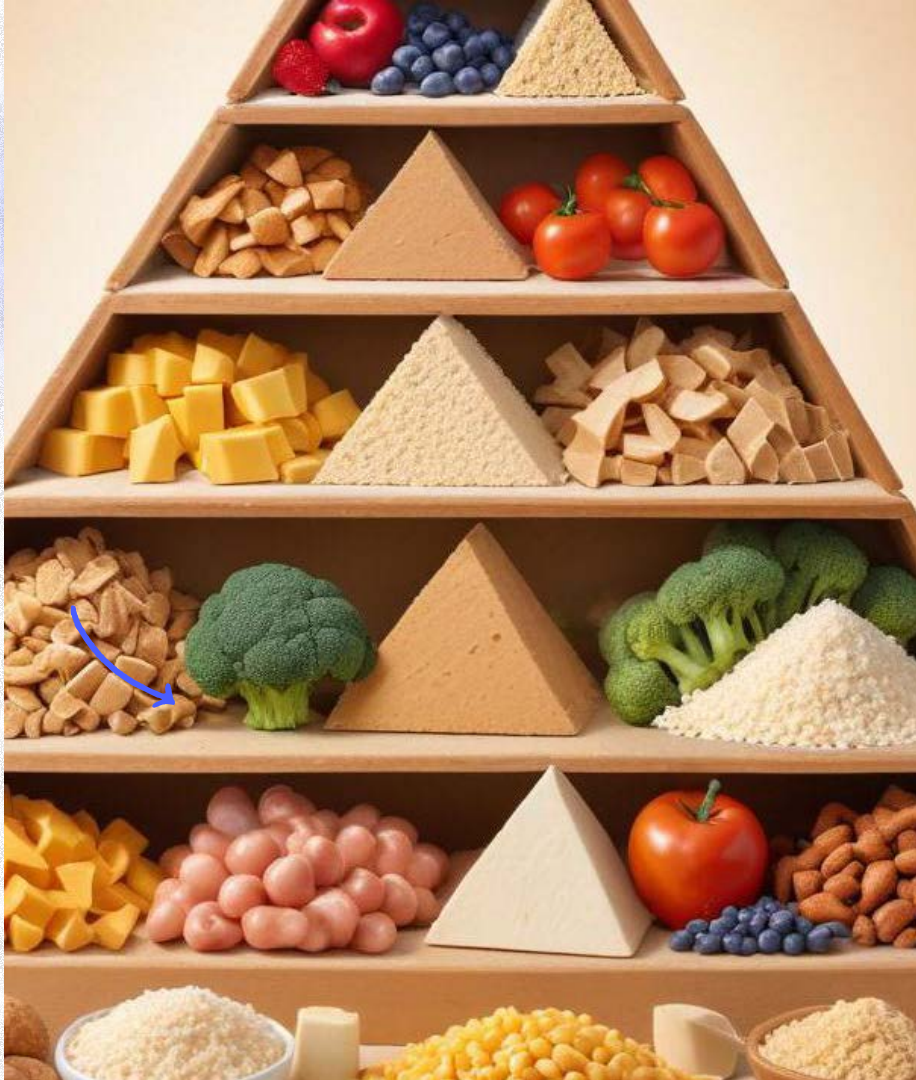
Introduction

This presentation explores the basic structure of carbohydrates, detailing their definitions, types, and functions, as well as their importance in biological processes.

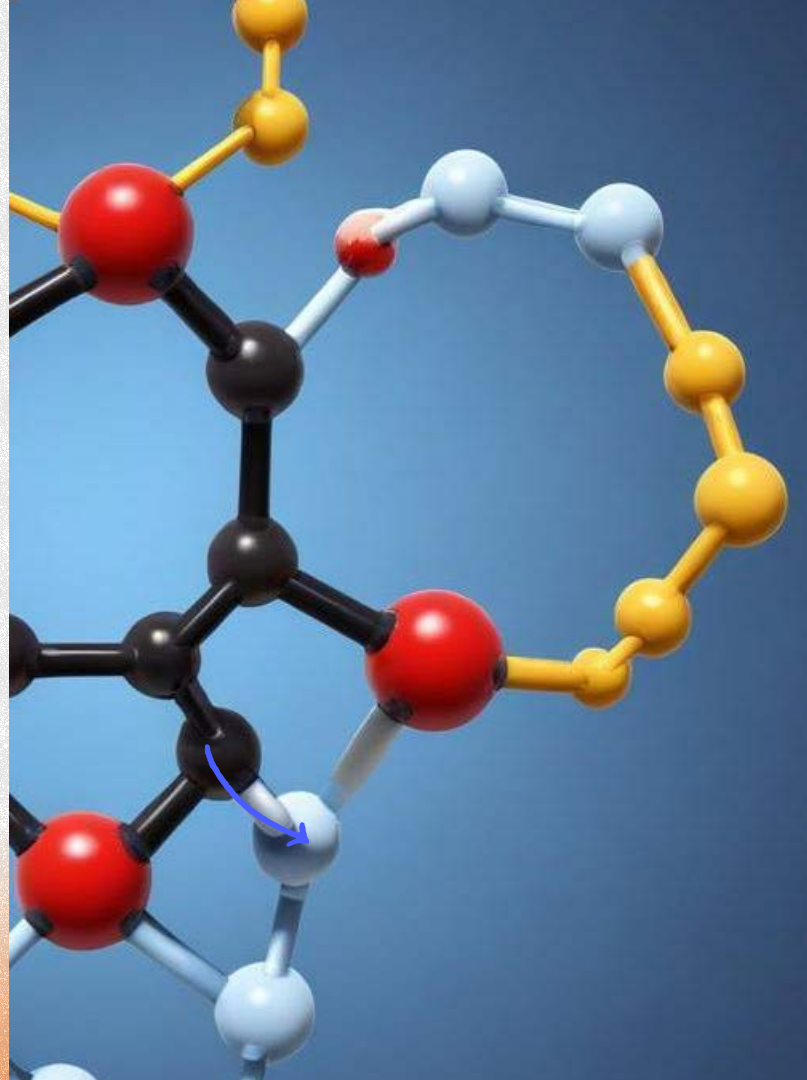


01

Carbohydrate Basics

Definition of carbohydrates

Carbohydrates are organic compounds composed of carbon, hydrogen, and oxygen. They are crucial for energy storage and supply in living organisms. Simple carbohydrates are sugars, while complex carbohydrates are composed of longer chains of sugar molecules.



Types of carbohydrates

Carbohydrates can be categorized into three main types: monosaccharides (simple sugars like glucose), disaccharides (two sugar units like sucrose), and polysaccharides (complex carbohydrates like starch and cellulose). Each type plays a unique role in nutrition and metabolism.

Functions of carbohydrates

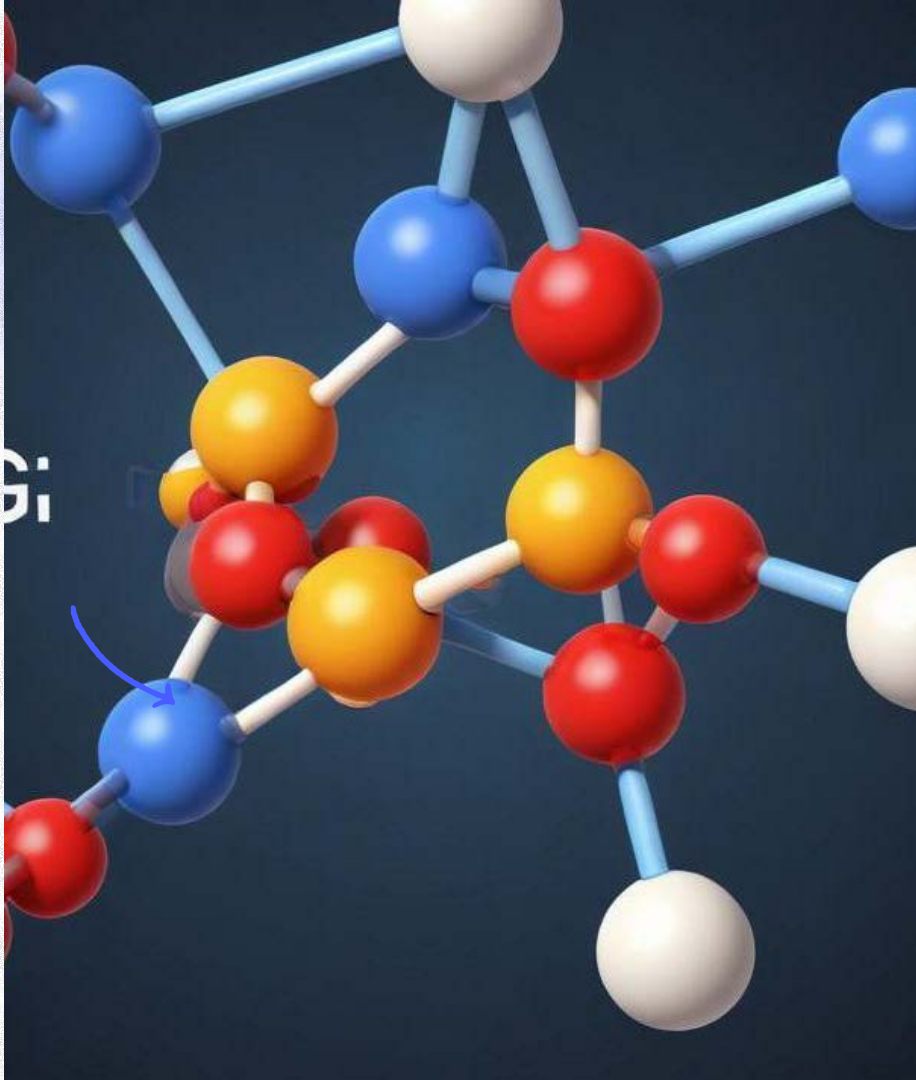
Carbohydrates serve multiple functions in living organisms. Their primary role is to provide energy through glucose metabolism. They are also vital for structural integrity in cells, play a role in cell recognition and signaling, and store energy in the form of glycogen in animals and starch in plants.

02

Carbohydrate Structure

Monosaccharides structure

Monosaccharides are the simplest form of carbohydrates, consisting of single sugar units. Each monosaccharide has a formula of (CH2O)n, where n can be 3 or more. Common examples include glucose, fructose, and galactose, which have essential roles in metabolism.



Disaccharides structure

Disaccharides are formed by the condensation of two monosaccharides, linked by a glycosidic bond. Examples include sucrose (glucose + fructose) and lactose (glucose + galactose). Their structure influences digestion and energy release rates in the body.

Polysaccharides structure

Polysaccharides consist of long chains of monosaccharide units. Examples include starch, glycogen, and cellulose. Their structure can be branched or unbranched, affecting their function in energy storage or cell structure in plants and animals.

Conclusions

Carbohydrates are essential biomolecules with diverse structures and functions. Understanding their basic definitions, types, and functional significance underscores their importance in biochemistry and human nutrition.