

Polysaccharides are complex carbohydrates made up of multiple monosaccharide units joined together through glycosidic bonds. Here are some important notes about polysaccharides:

Definition:

Polysaccharides are large, complex molecules composed of repeating units of monosaccharides linked by glycosidic bonds.

They are considered complex carbohydrates due to their structural complexity compared to simpler sugars.

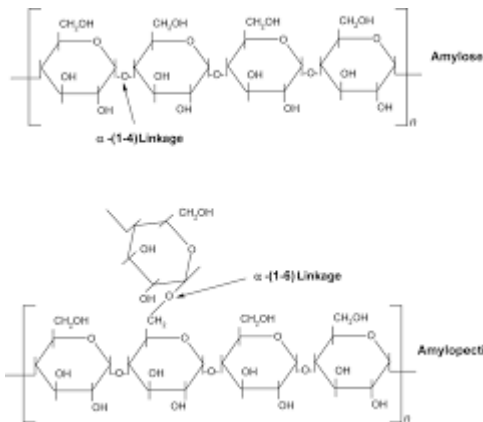
Role in Living Organisms:

Storage Form: Polysaccharides serve as a storage form of energy in plants and animals.

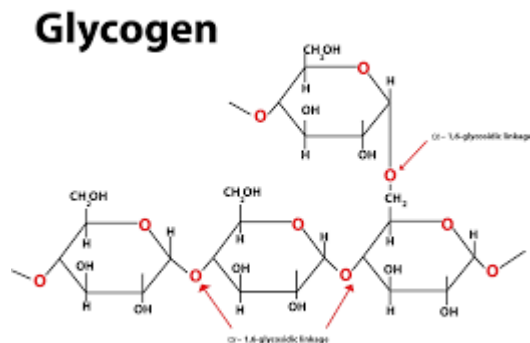
Structural Role: In addition to energy storage, some polysaccharides play a structural role in organisms, providing support and rigidity.

Common Polysaccharides:

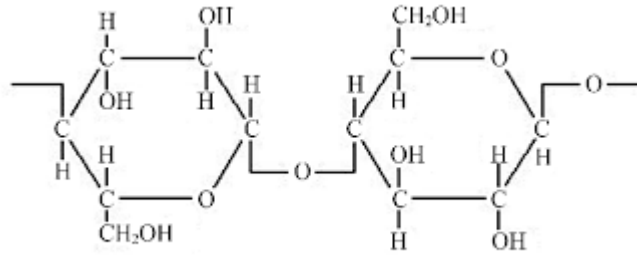
Starch: A polysaccharide made up of glucose units. It is the primary storage form of energy in plants and is found in seeds, roots, and tubers.



Glycogen: A polysaccharide made up of glucose units. It serves as the primary storage form of energy in animals, mainly in the liver and muscles.

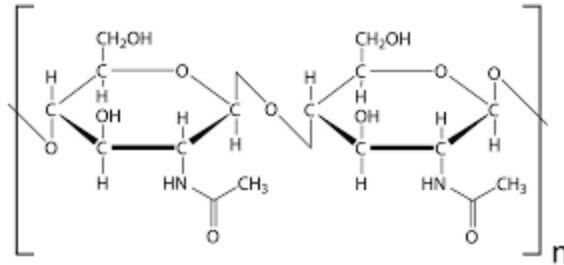


Cellulose: Composed of glucose units linked by β -1,4-glycosidic bonds. It is a major component of plant cell walls, providing structural support.



Cellulose

Chitin: Found in the exoskeletons of arthropods (such as insects and crustaceans) and in the cell walls of fungi. It is composed of N-acetylglucosamine units.



Structural Differences:

Starch and glycogen have branched structures, allowing for rapid release of glucose when energy is needed.

Cellulose has a linear structure and forms bundles of strong fibers, providing rigidity to plant cell walls.

Digestibility:

Starch is readily digestible by enzymes in the human digestive system, breaking down into glucose for energy.

Cellulose, on the other hand, is not digestible by human enzymes due to the β -1,4 linkages. However, it serves as dietary fiber, aiding in digestion and promoting bowel regularity.

Formation and Breakdown:

Polysaccharides are formed through condensation reactions, similar to disaccharides.

They are broken down into monosaccharides through hydrolysis reactions, involving the addition of water.

Regulation of Blood Sugar:

The breakdown of polysaccharides into monosaccharides (e.g., glucose) contributes to the regulation of blood sugar levels.

Dietary Importance:

Polysaccharides, especially dietary fiber, are important components of a healthy diet. They contribute to digestive health, help maintain a feeling of fullness, and can impact cholesterol levels