

The four classifications of biological molecules are:

1. carbohydrates (sugars and starches)
  2. lipids (fats, oils, waxes)
  3. proteins (amino acids, enzymes, muscle tissue)
  4. nucleic acid (DNA, RNA = genetic material)
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1. **Carbohydrate** = a type of organic molecule containing carbon, oxygen, and hydrogen (C, H, O) that provides energy to living things or forms strong structures in living things.

\*\*\**Interesting notes:*

There are twice as many hydrogen atoms as there are oxygen atoms in a carbohydrate. The root of the word comes from “hydrated carbon”. Why?

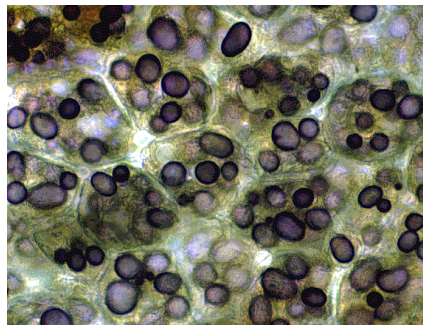
Examples:

**sugars** (energy molecule that can be readily used or stored in vacuoles for later)



Household sugar granules (sucrose)

**starches** (long chains of sugars, typically sugar storage chains)

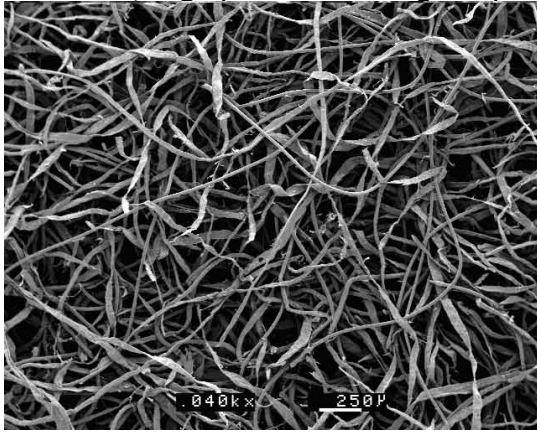


Starch being stored in the cells of a bean embryo (dark circles are stained by iodine)



Starch extracted from corn.

*cellulose* (tough plant fiber that gives plants structure)



cellulose fibers of a piece of clothing made from plant fibers (photograph made using a SEM)

MONOSACCHARIDE = a simple, single-sugar molecule (a type of carbohydrate). Most are five or six-carbon sugars arranged in a chain or a ring.

\*\*\*The technical definition of monosaccharide is a bit more difficult to understand right now, but it will make sense later: a sugar that cannot be hydrolyzed into smaller, carbon containing molecules (simpler sugars)

Glucose and fructose are common monosaccharides. Their structural formulas:

What are the molecular formulas of these two monosaccharides?

Functions of these monosaccharides: ENERGY!!!