



**Department of Forensic evidence**



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**Biology Lab**

**((Organic Substances in the Cells))**

**Lab/4**

**1 stage**

**By**

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### What is organic Substances?

In general, organic compounds are substances that contain carbon (C), and carbon atoms provide the key structural framework that generates the vast diversity of organic compounds. All things on Earth (and most likely elsewhere in the universe) that can be described as living have a crucial dependence on organic compounds.

### Organic Substances in the Cells:

Most of these organic compounds belong to one of four classes of molecules:

#### 1-carbohydrates:

The carbohydrates include simple sugars as well as polysaccharides. These simple sugars, such as glucose, are the major nutrients of cells their breakdown provides both a source of cellular energy and the starting material for the synthesis of other cell constituents. The six-carbon ( $n= 6$ ) sugar glucose ( $C_6H_{12}O_6$ ) is especially important in cells, since it provides the principal source of cellular energy.

#### 2- lipids:

Lipids have three major roles in cells. First, they provide an important form of energy storage. Second, and of great importance in cell biology, lipids are the major components of cell membranes. Third, lipids play important roles in cell signaling, both as steroid hormones



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(e.g., estrogen and testosterone) and as messenger molecules that convey signals from cell surface receptors to targets within the cell.

### **3-nucleic acids:**

The nucleic acids—DNA and RNA—are the principal informational molecules of the cell. Deoxyribonucleic acid (DNA) has a unique role as the genetic material, DNA can be seen in most cells of all living creatures. It is a vital part of reproduction, where genetic heredity occurs. Therefore, the main objective is to transfer the inheritance from the older generation to future generations.

### **4- proteins:**

While nucleic acids carry the genetic information of the cell, the primary responsibility of proteins is to execute the tasks directed by that information. Proteins are the most diverse of all macromolecules, and each cell contains several thousand different proteins, which perform a wide variety of functions. The roles of proteins include serving as structural components of cells and tissues, acting in the transport and storage of small molecules (e.g., the transport of oxygen by hemoglobin), transmitting information between cells (e.g., protein hormones), and providing a defense against infection (e.g., antibodies).