

# [Testing for macromolecules](https://assignbuster.com/testing-for-macromolecules/)

[Nutrition](https://assignbuster.com/essay-subjects/nutrition/)

BIOLOGY LAB REPORT PRACTICAL M1 TESTING FOR MACROMOLECULES Title : Testing for Macromolecules Abstract : To test for macromolecules (carbohydrates, lipids, nucleic acids, and proteins), iodine solution, alcohol, aceto-orcein stain and copper sulfate solution are used. The conclusions for all of the tests are positive. Introduction: A) Carbohydrate (starch) Carbohydrates are chemical compounds that contain oxygen, hydrogen, and carbon atoms. They consist of monosaccharide sugars of varying chain lengths. Certain carbohydrates are an important storage and transport form of energy in most organisms, including plants and animals. Carbohydrates are classified by their number of sugar units: monosaccharides (such as glucose and fructose), disaccharides (such as sucrose and lactose), and polysaccharides (such as starch, glycogen, and cellulose). B) Lipids Lipids are one class of aliphatic hydrocarbon-containing organic compounds essential for the structure and function of living cells. Lipids are characterized by being water-insoluble but soluble in nonpolar organic solvents. Examples of lipids are fats and oils. Fats and oils are made from two kinds of molecules: glycerol (a type of alcohol with a hydroxyl group on each of its three carbons) and three fatty acids joined by dehydration synthesis. C) Nucleic acids A nucleic acid is a complex, high-molecular-weight biochemical macromolecule composed of nucleotide chains that convey genetic information. The most common nucleic acids are deoxyribonucleic acid (DNA) and ribonucleic acid (RNA). Nucleic acids are found in all living cells and viruses. Nucleic acids consist of nitrogenous compounds called purines or pyrimidines, a sugar and phosphate. D) Proteins Protein is a group of complex organic macromolecules that contain carbon, hydrogen, oxygen, nitrogen, and usually sulfur and are composed of one or more chains of amino acids. Proteins are fundamental components of all living cells and include many substances, such as enzymes, hormones, and antibodies, that are necessary for the proper functioning of an organism. They are essential in the diet of animals for the growth and repair of tissue and can be obtained from foods such as meat, fish, eggs, milk, and legumes. Materials : - Test tubes - Iodine solution - Microscope and slides - Alcohol - Hot plate - Distilled water - Starch - Aceto-orcein stain solution - Potato - Sodium hydroxide solution - Onions - Copper sulfate solution - Margerine - Water bath - Olive oil - Cooked egg white Methods : Refer to page 17 and 18 (Stage 2 Biology) Results : A) Test for carbohydrate When drops of iodine were added to starch suspension, the solution changed colour from brown to blue. Image viewed under microscope Under magnification 10x10 B) Test for lipids In the test tube containing margarine, when alcohol is added, the margarine does not dissolve in the alcohol and was suspended on the top of the solution. When distilled water was added to the test tube, cloudiness occurred. Meanwhile, in the test tube containing olive oil, when alcohol is added, two liquid layers are obtained. When distilled water was added to the test tube, cloudiness also occurred. In the controlled test tube, water and alcohol dissolved in each other. C) Test for nucleic acids Image without aceto-orcein stain Image with aceto-orcein stain Added added Under magnification 10x10 Under magnification 10x10 D) Test for proteins When copper sulfate solution was added to the test tube containing cooked egg white and sodium hydroxide, the solution changed colour from blue to deep purple. Discussion : A) Test for carbohydrate When drops of iodine were added to the starch suspension, brown iodine colour changed to blue. For the thin wedge of potato, when drops of iodine was added to it and viewed under the microscope, blue spots can be seen. This blue spots (starch granules) indicates that potato contains carbohydrate. B) Test for lipids In both of the test tubes, cloudiness occurred. However, the cloudiness in the test tube containing olive oil, alcohol and distilled water was greater than the cloudiness that occurred in the test tube containing margarine, alcohol and distilled water. This is because olive oil is an unsaturated triglyceride while margarine is a saturated triglyceride. In the controlled test tube, water and alcohol dissolved in each other. C) Test for nucleic acids Under the microscope, the slide without aceto-orcein stain added to the epidermis of onion, only the cell wall and cytoplasm of the cell can be seen. For the slide that is added with aceto-orcein stain, the nucleus of the cell can be seen as it is stained by the aceto-orcein stain. This indicates that nucleic acids are present in the nucleus. D) Test for proteins The cooked egg white was still in solid form when sodium hydroxide was added to it. After the mixture is warmed, the cooked egg dissolved in the solution and the solution turns light yellow. When copper sulfate solution was added to the test tube, it changed colour from blue to deep purple. This shows that protein is present in the test tube. Errors: In the experiment, one error that occurred was the thick slice of specimen. This affected the image that was viewed under the microscope. This is a random error. Conclusion: Macromolecules are large molecules found in cells. These macromolecules are carbohydrates, lipids, nucleic acids, and proteins.