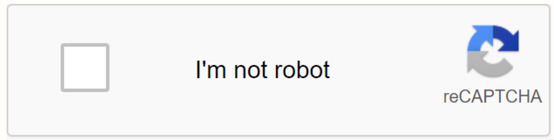

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Lipids used for energy storage

All lipids are hydrophobic (although some may have hydrophyll components.) Lipids are made of hydrogen and carbon chains, making them hydrocarbons. There are different types of lipids, but the lipids used for energy storage are triglycerides. Their name comes from their structure; triglycerides are composed of three fatty acids bound to glycerol. Fatty acids are often made of methyl groups (3 hydrogen and 1 carbon) as well as a carboxyl group. The first is the fat appearance while the second is acid. The combination of fatty acids plus a glycerol contains a lot of energy. Lipids contain more energy than carbohydrates, which are stored as glycogen in the body. Triglycerides are the main form of fat stored in animals. My photograph shows aerobic activity, which is when the body uses its fat deposits as energy. Lipids. WKU Bio 113. University of Western Kentucky, 2005. Web. August 23, 2011. <http: bioweb.wku.edu/courses/biol115/wyatt/biochem/lipid/lipid1.htm=>. Lipids are a group of biological molecules that include fats, oils and some steroids. They are made from fatty acids bound to a wide range of other compounds. Their importance in the biological world is immense. They have a number of important roles in the cells of all organisms on Earth. Of the four molecules in life, lipids probably have the greatest variation in their basic structure and are much more difficult to define than proteins, carbohydrates, and nucleic acids. Almost all lipids are insoluble in water. They are known as hydrophobic molecules because they are repelled by water. Why are lipids important? Lipids are essential for life on Earth. They play many important roles in maintaining the health of an organism. Probably the most important function that lipids perform is like the bricks of cell membranes. Other functions include energy storage, insulation, cellular communication and protection. Cell membranes Cell membranes consist of a double layer of lipids known as 'phosphopids'. The plasma membrane around a cell provides a barrier separating the contents of a cell from the outside world. It is responsible for the control of substances that enter and leave a cell.Organelles are specialized membrane-related structures found in the cells of animals, plants, fungi and gallbladders. They perform particular tasks such as photosynthesis and breathing.Organelles are the key feature of eukaryotic cells that have made plants, animals and fungi so efficient in the use of resources. Organelles would not exist if it were not for lipid-based membranes. Energy storage Lipids play an important role in energy storage. If an animal eats excessive amount of energy is able to store energy for later use in fat molecules. Fat molecules can store a very high amount of energy for their size which is important for animals because of our mobile lifestyles. Plants, on the other hand, store energy less efficiently in carbohydrates because they don't need to move. InsulationFats are </http:> </http:> for thermal insulation. Marine mammals, such as seals, dolphins and whales, offer a perfect example of how fats can provide isolation. In order to prevent them from freezing until they die in water, many marine mammals have a thick layer of fat called 'blubber' to keep them warm. Blubber covers the whole body apart from the fins and head and prevents water from cooling the body's internal temperatures. The fat layer also makes their bodies extremely lean to move through the water. Fats also provide a protective layer around important organs in animals such as our liver and kidneys. Cell communication Steroids are a group of lipids involved in cellular communication. A number of steroids are hormones and are important for many processes in the body including growth, sexual development, metabolism regulation and immune defense. Lipid structureCi is a wide variety of different lipids, and the chemical structure varies between each of them. For this reason, it is difficult to outline a general structure of a lipid. However, all lipids contain at least one hydrocarbon chain (i.e. a chain of carbon and hydrogen atoms) with an acidic end. Hydrocarbon chains are insoluble in water. The vast majority of lipids have long chains of hydrocarbons, which is why they are hydrophobic molecules, that is, they do not dissolve in water. Fatty acids Fatty acids are a distinctive feature of lipids. A fatty acid is a chain of long hydrocarbons (alkyl) with an acidic head. The sour head is more correctly known as a 'carboxylic acid' and has the chemical structure -COOH, the same structure that makes vinegar acidic. A fatty acid can be saturated or unsaturated. If two carbon atoms in the hydrocarbon chain share a double bond, a fatty acid is known as unsaturated. If there are no double bonds along the alkyl chain, fatty acid is saturated. This is because all carbon atoms have bonded to as many hydrogen atoms as possible. The alkyl chain is therefore saturated with hydrogen. The presence of a double bond makes a fatty acid unsaturated because it is possible that the alkyl chain is glued to multiple hydrogen atoms. Fats and oilsFats are a common and well-known form of lipids. They are made by tying fatty acids to an alcohol. The most common fat is triacilglycerol. Triacylglycerol is a fat made from three fatty acids linked to an alcohol called 'glycerol'. Glycerol is a three-carbon alcohol and each of the coals binds to a fatty acid. The structure of fatty acids of a fat determines whether a fat is saturated or unsaturated. Double bonds in one or more fatty acid alkyl chains create unsaturated fat. A fatty molecule with no double bonds in any of its alkyl chains is known as a saturated fat. A double bond creates a bend in alkyl chain. This reduces the way fat molecules tightly can be packed together. Freely packed fats have lower melting points and that's why unsaturated fats, such as vegetable oils, are commonly liquid at room temperature. Environment. fats, on the other hand, have higher melting points and are more likely to be found as solids at room temperature. The main function of fat is to store energy. They are more common in animals because they contain a large amount of energy for their weight. A fatty molecule but will hold much more energy than a carbohydrate molecule of the same weight. For mobile animals carrying extra weight it is not ideal, so storing energy in light molecules is beneficial. Fats are stored in tissues known as fat tissue and in cells known as fat cells. Phosphofipidids are less well known than fats and oils, but they are essential for life on Earth. They are the molecules used to build membranes that are around and inside cells. Without a plasma membrane, a cell would not be able to survive. A phosphopid is similar in structure to a triacilglycerol. It contains two fatty acids plus a group of phosphates bound to the three coals of a glycerol molecule. The only difference between a phosphopid and a fat is the replacement of a fatty acid with a group of phosphates. A group of phosphates has a negative charge, so many other molecules can attach to the phosphate group. This makes a wide variety of different possible phosphopids. The combination of fatty acids and a group of phosphates make phosphopids ideal for the production of cell membranes. The phosphate group is soluble in water and is therefore attracted to water (hydrophilic). Fatty acids are insoluble in water and are hydrophobic. A phosphopid membrane contains two layers of phosphopids. In both layers, hydrophobic fatty acids point inwards towards each other. Phosphate groups are facing outwards to the water-based environments of the cell and the surrounding world. This phosphopid bilayer creates a barrier for substances moving in and out of a cell. If a substance wants to pass through the membrane it must be able to move through the hydrophilic barrier of phosphate groups and the hydrophobic barrier of fatty acids. Many substances can only move in and out of cells through membrane channels created by proteins. SteroidsSteroids are a particular type of lipid with a unique chemical structure. They are characterized by carbon atoms arranged in four adjacent rings - three rings made from 6 carbon atoms and the final ring made of 5 carbon atoms. Steroids are naturally produced in the body. Examples include cholesterol and sex hormones testosterone, progesterone and estrogen. Cholesterol is the most abundant steroid in the body and is produced in the brain, blood and nervous tissue. SummaryLipids are biological molecules such as fats, oils, phosphopids and steroidsE are important for cell membranes, energy storage, Cellular communicationLipids have a wide range of structures, but all include a chain of hydrocarbons that is almost always in the form of a fatty acid. Fats are lipids made by binding fatty acids with an alcohol – the most common fat is triacillycerol triacillycerol contains three fatty acids linked to a carbon 3 alcohol called glycerol. Phosphopids are the compounds that make up cell membranes – they have water-soluble and insoluble ends that form a useful barrier around cells. Steroids are a form of lipid with carbon atoms arranged in four rings. They are produced naturally in the body and include hormones such as cholesterol, testosterone and estrogen. Last modified: August 31, 2020 Enter your data to access our 6-week FREE course on the biology email. Learn about animals, plants, evolution, the tree of life, ecology, cells, genetics, fields of biology, and more. Success! A confirmation email has been sent to the email address you just provided. Check your emails and make sure you click on the link to start our 6 week course. Page 2 Lipids are a group of biological molecules that include fats, oils, and some steroids. They are made from fatty acids bound to a wide range of other compounds. Their importance in the biological world is immense. They have a number of important roles in the cells of all organisms on Earth. Of the four molecules in life, lipids probably have the greatest variation in their basic structure and are much more difficult to define than proteins, carbohydrates, and nucleic acids. Almost all lipids are insoluble in water. They are known as hydrophobic molecules because they are repelled by water. Why are lipids important? Lipids are essential for life on Earth. 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