OPEN ACCESS Freely available online

Journal of Glycomics & Lipidomics

ISSN: 2153-0637

Short Communication

Biosynthesis of Different Lipid Molecules

Jahnu Bhatt*

Department of Biosciences and Bioengineering, Indian Institute of Technology, Guwahati, India

DESCRIPTION

The synthesis and breakdown of lipids in cells is known as lipid metabolism. It involves the storage or breakdown of fats for energy as well as the creation of structural and functional lipids, such as those necessary for the formation of cell membranes [1]. Animals may consume these fats naturally from food or the liver produces them. The process of creating these fats is known as lipogenesis.

Triglycerides and cholesterol make up the majority of lipids that are absorbed from meals and found in the human body. Fatty acids and membrane lipids are two more lipid types that can be present in the body. There are two sources of fats that organisms can use to obtain energy: from consumed dietary fats and from stored fat [2]. Lipid metabolism is frequently thought of as the digestion and absorption process of dietary fat, but this is incorrect. Both types of fat are used by vertebrates (including humans) to generate energy for the operation of organs like the heart. Lipids are hydrophobic molecules, thus solubilizing them is necessary before lipid metabolism.

Lipid metabolism frequently starts with hydrolysis, which is accomplished with the aid of different digestive enzymes [3]. The absorption of the fatty acids into the intestinal walls, epithelial cells follows the hydrolysis and the Fatty acids are packed and delivered to the rest of the body in epithelial cells.

Membrane lipids

Following lipid categories are utilized in lipid metabolism:

Phospholipids: Found in many areas of the body, phospholipids are a crucial constituent of the lipid bilayer of the cell membrane.

Sphingolipids: These are mostly present in the neural tissue's cell membrane.

Glycolipids: The primary function of glycolipids is to maintain the stability of the lipid bilayer and to aid in cell identification.

Glycerophospholipids: The brain and other neural tissue both contain significant levels of glycerophospholipids.

Other types of lipids

Cholesterols are the primary precursors for several hormones in human bodies, including progesterone and testosterone, are cholesterols. Cholesterol primarily regulates the fluidity of cell membranes. Triacylglycerides are the primary type of energy storage in the human body. One of the precursors required for the creation of cholesterol and lipid membranes is fatty acid. The liver secretes bile salts, which aid in the small intestine's ability to digest lipids [4]. The body produces eicosanoids from fatty acids, which are needed for cell signaling. Fatty acids are converted to ketone bodies in the liver. They serve the purpose of generating energy during times of hunger or poor food intake.

Storage lipids in adipose tissues, in addition to dietary fats, these are one of the primary energy sources for living things. The organisms can produce cholesterol, lipid membranes, and triacylglycerols through a variety of mechanisms.

Lipid biosynthesis in membranes

Glycerophospholipids and sphingolipids are the two main groups of membrane lipids. Although, our body produces a wide variety of membrane lipids. First, the backbone (sphingosine or glycerol) is formed; then, fatty acids are added to the backbone to form phosphatidic acid [5]. The addition of various hydrophilic head groups to the backbone of phosphatidic acid results in additional modification. In the membrane of the endoplasmic reticulum, membrane lipid production takes place.

Biosynthesis of triglycerides: The production of triglycerides also uses phosphatidic acid as a precursor. Aryltransferase will transform diacylglyceride from phosphatidic acid into triacylglyceride after phosphatidic acid phosphotase has transformed phosphatidic acid to diacylglyceride. In the cytoplasm, tryglyceride biosynthesis takes place.

Biosynthesis of fatty acid: Acetyl-CoA, which is found in the cytoplasm of the cell, is the precursor for fatty acids. Using palmitate (16:0) as a model substrate, the entire net reaction is as follows:

$$8\ \text{Acetyl-CoA} + 7\text{ATP} + 14\text{NADPH} + 6\text{H} \rightarrow \text{palmitate} + 14\text{NADP} + 6\text{H}_2\text{O} + 7\text{ADP} + 7\text{P}$$

Correspondence to: Jahnu Bhatt, Department of Biosciences and Bioengineering, Indian Institute of Technology, Guwahati, India, E-mail: jbtr328@gmail.com

Received: 01-Jun-2022, Manuscript No. JGL-22-18464; **Editor assigned:** 03-Jun-2022, PreQC No. JGL-22-18464 (PQ); **Reviewed:** 17-Jun-2022, QC No. JGL-22-18464; **Revised:** 24-Jun-2022, Manuscript No. JGL-22-18464 (R); **Published:** 04-Jul-2022, DOI: 10.4172/2153-0637.22.11.314.

Citation: Bhatt J (2022) Biosynthesis of Different Lipid Molecules. J Glycomics Lipidomics.11:314.

Biosynthesis of cholesterol: Acetyl-CoA can be converted to cholesterol *via* the isoprenoid route, a multi-step process. Because they can be changed in the body to create other hormones, including progesterone, cholesterols are necessary. In the cytoplasm of liver cells, 70% of cholesterol is produced.

CONCLUSION

It involves the storage or breakdown of fats for energy as well as the formation of structural and functional lipids and cell membranes. Animals may consume the fats naturally from food or the liver produces to them. Triglycerides and cholesterol make up the majority of lipids that are absorbed from meals and found in the human body. Fatty acids and membrane lipids are two lipid types that can be present in the body. Lipid metabolism frequently starts with hydrolysis, which is accomplished with the aid of different digestive enzymes. Cholesterols are the primary precursors for several hormones in human bodies, including progesterone and testosterone, are cholesterols. Cholesterol primarily regulates the fluidity of cell membranes. Storage lipids in adipose tissues, in addition to dietary fats, these are one of the primary energy sources for living things. The organisms can produce cholesterol, lipid membranes, and triacylglycerols through a variety of mechanisms. Glycerophospholipids and sphingolipids are the two main groups of membrane lipids. In the membrane of the endoplasmic reticulum, membrane lipid production takes place. The production of triglycerides also uses phosphatidic acid as a precursor. In the cytoplasm, tryglyceride biosynthesis takes place. Acetyl-CoA, which is found in the cytoplasm of the cell, is the precursor for fatty acids. Using palmitate (16:0) as a model substrate, the entire net reaction is as follows:. Acetyl-CoA can be converted to cholesterol *via* the isoprenoid route, a multi-step process. In the cytoplasm of liver cells, 70% of cholesterol is produced.

REFERENCES

1. Voet D, Voet JG, Pratt CW. Fundamentals of biochemistry: Life at the molecular level. JW. 2016.
2. Mashaghi S, Jadidi T, Koenderink G, Mashaghi A. Lipid nanotechnology. Int J Mol Sci. 2013;14(2):4242-4282.
3. Foufelle F, Ferre P. Mechanism of storage and synthesis of fatty acids and triglycerides in white adipocytes. Physiol Physiopathol Adip Tiss. 2013:101-121.
4. Wiegandt H. Insect glycolipids. Biochim Biophys Acta. 1992;1123(2):117-126.
5. Bach D, Wachtel E. Phospholipid/cholesterol model membranes: Formation of cholesterol crystallites. Biochim Biophys Acta Biomembr. 2003;1610(2):187-197.