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Journal of Glycomics & Lipidomics

ISSN: 2153-0637

Perspective

Absorption and Digestion of Triglycerides (Triacylglycerols) in Lipids

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DESCRIPTION

The biological molecules known as lipids include fats, oils, and some steroids. They are made of fatty acids that are bonded to a wide variety of other substances. They play an important role in the biological world. In the cells of every organism on Earth, they play a number of crucial roles. Compared to proteins, carbohydrates, and nucleic acids, lipids arguably have the greatest variation in their fundamental structure of the four molecules that make up life and are significantly more challenging to define. In water, almost all lipids are insoluble. Because they repel water, these molecules are referred to as hydrophobic.

The liver secretes detergents known as bile salts through the gall bladder, which then disperse the ingested triglycerides into micelles in the small intestine. The dispersed fats are then hydrolyzed by lipases, enzymes in the pancreas, to produce monoglycerides and free fatty acids. Fats are common type and well known form of lipids. They are made by bonding an alcohol to fatty acids. Triacylglycerol is the fat that is used the most. A fat called triacylglycerol is made by bonding three fatty acids to an alcohol called glycerol.

Glycerol is an alcohol with three carbons that binds to one fatty acid at a time. A fat's saturated or unsaturated status is determined by the structure of its fatty acids. Unsaturated fat is produced by double bonds in one or more alkyl chains of the fatty acids. A saturated fat is a fat molecule that does not have any double bonds in any of its alkyl chains. A twofold bond makes a curve in an alkyl chain. This makes it harder to pack fat molecules together as tightly as they can. Because of their lower melting points, loosely packed fats, like vegetable oils, are typically liquid at room temperature. Saturated fats, on the other hand, are more likely to be found as solids at room temperature and have a higher melting point. Fat's primary function is to store energy. They are most normal in animals since they contain an extremely enormous measure of energy for their weight. A molecule of fat will hold significantly more energy than a molecule of carbohydrate of the same weight. It is advantageous to store energy in lightweight molecules because carrying extra weight is not ideal for living animals. Adipose cells and adipose tissue are the two types of cells in which fat are stored.

Bile acids form an emulsion from ingested lipids. From cholesterol, bile acids are produced in the hepatocyte and transported to the biliary canaliculus *via* an Adenosine Triphosphate (ATP) dependent transport system. About half of the bile acids reach the gallbladder as they travel through the biliary tract. The fat is emulsified by the bile acids released by the liver and gallbladder in the form of micelles containing triglycerides (triacylglycerols) in the centre and surrounded by bile acids. Pancreatic lipase, which gains access to the triglyceride through gaps between the bile salts, can break down fats.

Pancreatic lipase and phospholipase A2, both of which are secreted by the pancreas and activated by trypsin, break down the fats in the intestine into a mix of monoglycerides and diglycerides. Two Free Fatty Acids (FFAs) and one 2-monacyl-sn-glycerol are released by pancreatic lipase and quickly absorbed through the intestinal wall. Fatty Acid Transporter Protein 4 (FATP4) is the long-chain fatty acid transporter in the mature enterocyte's apical side

CONCLUSION

Digestion and absorption of lipids present particular difficulties. In contrast to carbohydrates and proteins, triglycerides are large molecules that cannot be dissolved in water. As a result, when they are in a watery environment like the digestive tract, they prefer to form large droplets. The stomach related process needs to break those huge beads of fat into more modest drops and afterward enzymatically digest lipid atoms utilizing compounds called lipases. The mouth and stomach play a small part in this process, but the small intestine is where most of the enzymatic digestion of lipids takes place. Because lipids are not water-soluble and do not mix with the watery blood, the products of lipid digestion must be absorbed into the circulation and transported throughout the body from small intestine.

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Received: 28-Feb-2023, Manuscript No. JGl-23-22095; **Editor assigned:** 02-Mar-2023, Pre QC No. JGl-23-22095 (PQ); **Reviewed:** 16-Mar-2023, QC No. JGl-23-22095; **Revised:** 23-Mar-2023, Manuscript No. JGl-23-22095 (R); **Published:** 30-Mar-2023, DOI: 10.35248/2153-0637.23.12.331.

Citation: Immanuel P (2023) Absorption and Digestion of Triglycerides (Triacylglycerols) in Lipids. J Glycomics Lipidomics. 12:331.