Atherosclerosis: Open Access

Paola, Atheroscler open access 2021, 6:6

Editorial Open Acces

An Overview on Lipoprotein Role and Mechanism

Rogliani Paola*

Department of Cardiac and Cardiovascular Systems, University of Bologna, Bologna, Italy

About the Study

Lipoproteins are lipid transporters that transport plasma lipids, in which hydrophobic lipids (triglycerides and cholesterol) are transported within the interstitial fluid and plasma. It includes the transport of energy in the form of triglycerides from liver and intestine to muscles and adipose tissue, as well as the transport of cholesterol both from intestine and liver to peripheral tissues, as well as from peripheral tissues to the liver. Lipoproteins are complex molecules which contains several different components. They contain a triglycerides and cholesterol esters. Triglycerides are catabolized into fatty acids which serve as energy storage or production, and cholesterol is crucial for steroid synthesis, cellular membrane formation, and bile acids. Surrounding this core is a made of phospholipids, free cholesterol, and apolipoproteins. Apolipoproteins are classify into five main classes lipoprotein includes chylomicrons, Very-Low-Density Lipoprotein (VLDL), Intermediate-Density Lipoprotein (IDL), Low-Density Lipoprotein (LDL), and High-Density Lipoprotein (HDL) provide function and structure in lipid metabolism. The differentiation of these lipoproteins is categorized based on molecular size, and its lipid content, and the type of apolipoprotein. HDL (High-Density Lipoprotein), known as "good cholesterol," involves in reverse cholesterol transport, while LDL (Low-Density Lipoprotein), known as "bad cholesterol," promotes atherosclerosis, which means narrowing of the arterial blood vessels which transports the oxygenated blood to the heart. Cholesterol synthesis is initiated by acetyl-CoA, which is produced from amino acids, fat, and carbohydrate metabolism. By the series of enzymatic reactions the four different types of lipoproteins are evolved based on their composition and the molecular weight. The metabolic process starts with mevalonate and it transforms into activated isoprenes. Isoprenes converted to squalene, and then cholesterol formation takes place. 3-hydroxy-3-methyl-glutaryl-CoA reductase (HMG-CoA reductase) makes mevalonate, which is a critical enzyme reaction in regulating cholesterol formation and is the rate-limiting step. HMG-CoA reductase is also the target of statins to lower high LDL-cholesterol levels. Acetyl CoA can also get converted to triglycerides, which results in the formation of lipoproteins. Each lipoprotein has a unique composition with different apolipoproteins on its surface. Chylomicrons are of intestinal origin are large and carry dietary lipids. Lipids are one of the biological molecules of the human body, along with carbohydrates, proteins, and nucleic acids. Lipids are involved in multiple processes such as storing energy, serve as chemical messengers, forming cell membranes, and transports fat-soluble vitamins such as vitamin E. Lipids are the hydrophobic components, they need the transporters for the absorption of the components for the cellular function which are mediated by lipoproteins. Without lipoproteins, transport would not be possible, as the hydrophilic property of the blood is not compatible with the hydrophobic nature of lipids like cholesterol. Therefore, lipoproteins play a crucial role in the ability of the human body to utilize lipids, and the metabolism of these lipoproteins. Hyperlipidaemias are main risk factors for coronary heart disease. To prevent and treat the hyperlipidaemias understanding lipoprotein metabolism is essential. Exogenous fat is transported in chylomicrons from the intestine to the liver. After entry in the blood stream the chylomicrons are hydrolyzed by the enzyme endothelial-bound lipoprotein lipase. The liver utilizes the exogenous fat and releases surplus lipids *via* VLDL into the bloodstream. The VLDL is another substrate for lipoprotein lipase. Hyperlipoproteinaemias are the most frequent risk factor for arteriosclerosis.

***Corresponding author:** Rogliani Paola, Department of Cardiac and Cardiovascular Systems, University of Bologna, Bologna, Italy, E-mail: paola.rogliani@bologna.it

Received November 16, 2021; **Accepted** Novemebr 30, 2021; **Published** December 07, 2021

Citation: Paola R (2021) An Overview on Lipoprotein Role and Mechanism. Atheroscler Open Access. 6:e165.