Cholesterol, oxidative stress and inflammation

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Cardiovascular disease (CVD) is a leading cause of morbidity and mortality worldwide. The underlying cause of most CVD is the development of atherosclerosis. The dysregulation of cholesterol metabolism is invariably correlated with cardiovascular dysfunction and, for this reason, cholesterol transported in low density lipoproteins (LDL-c) and in high density lipoproteins (HDL-c) are used as biomarkers of cardiovascular disease risk. However, a variety of other cholesterol unrelated factors may also trigger the development of atherosclerosis, such as hypertension and infections. Such distinct stresses that induce atherogenesis have a common denominator: the binomial oxidative stress – inflammation. In this presentation we will discuss two topics: 1- the connection of defective tissue LDL receptor, a major cause of hypercholesterolemia, and mitochondria redox imbalance, and 2- the connection of cholesteryl ester transfer protein (CETP) expression, which reduces HDL-c, and acute anti-inflammatory responses. These two examples of altered cholesterol metabolism that lead to oxidative stress or anti-inflammatory response, respectively, may be relevant for atherosclerosis.