

8. HDL-X – The “good” cholesterol

There is a correlation between the risk of contracting heart disease and cholesterol levels in the blood. Interestingly, this correlation is opposite for cholesterol transported in low-density lipoproteins (LDL) and high-density lipoproteins (HDL). While the causal relationship between high levels of LDL cholesterol and heart disease is generally accepted and can be successfully targeted with drugs, the causality of the association between low HDL levels and increased risk of atherosclerotic diseases and diabetes is controversial.

Cholesterol, a component of the body's cell membranes, is indispensable for the human body. But when cholesterol levels are too high, problems can arise if it is deposited in the arterial walls. Both low-density lipoproteins (LDL) and high-density lipoproteins (HDL) serve to transport cholesterol within the blood plasma. Epidemiological, genetic and intervention studies have unequivocally shown that LDL promotes atherosclerosis. By contrast, the outcomes of the same kind of studies have questioned the previously assumed protective role of HDL in the pathogenesis of atherosclerosis. Likewise, the role of low HDL cholesterol in the pathogenesis of diabetes has not been adequately demonstrated.

HDL particles exhibit manifold effects, both *in vivo* and *in vitro*, seemingly protecting the human body from harmful chemical and biological processes. However, HDL has not yet been successfully employed in the prevention or treatment of heart disease or diabetes. “Medications that increase HDL cholesterol have not revealed any positive effects on heart disease,” says Arnold von Eckardstein, professor at the University Hospital Zurich and leader of the HDL-X research project.

This MRD Project is concerned with the many-faceted functions of HDL in health and disease. The aim of the project is to clarify which components of HDL are dis-

turbed in patients with diabetes or heart disease but are relevant for the prevention of these diseases. To this end, the scientists working on the project will isolate HDL particles from the blood of healthy and affected individuals and analyze their protein and lipid composition. In addition, the researchers will examine the biological interactions of HDL with endothelial, fat and muscle cells.

With the help of mathematical analysis of the data, those components of HDL will be identified which either alone or in combination might serve as biomarkers for an

increased risk of heart disease or diabetes. It is hoped that the resulting models will be able to contribute to the development of personalized treatment strategies and help monitor treatment outcomes.

“We are looking for a biomarker in HDL that can be used to assess the risk of atherosclerosis or diabetes,” says von Eckardstein. “The ideal result would be the discovery of one or more lipids or proteins that are strongly related to one of these disease states and can be targeted for drug development and used to assess the risk of these diseases.”



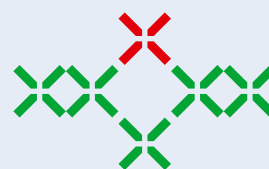
HDL-X at a glance

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