

# HDL

**High density lipoproteins** are lipoprotein with a higher protein content than other types of lipoproteins (VLDL, LDL). The main task of HDL is reverse cholesterol transport (RTC). This means that HDL takes up cholesterol from peripheral tissues and mediates its transport to the liver.

On the surface of lipoproteins we find either integral or surface proteins called **apolipoproteins** (apoproteins), which are necessary for the production and secretion of lipoproteins, allow binding to specific receptors, act as cofactors of enzymatic reactions. Several types of apolipoproteins associated with lipoproteins are known. The major HDL apoprotein is **apoA**.

## Physiological values

- serum values in men **1.0-2.1 mmol/l**
- serum values in women **1.2-2.7 mmol/l**

## Origin

HDLs are produced in the cells of the small intestine and liver. At first, they do not contain cholesterol or cholesterol esters. The second way HDL can form is a by-product of chylomicron and VLDL catabolism. There are several types of HDL, which differ in shape, apoprotein content and lipid content. HDL particles are remodeled in the circulatory system.

## Meaning

Cholesterol esters are gradually accumulated in the HDL particle and HDL is converted into a spherical lipoprotein particle. HDL obtains free cholesterol from tissues through receptors:

- SR-B1 (scavenger receptor class B type I): used both in the transfer of cholesterol in HDL to the liver or steroid tissue and in the uptake of excess cholesterol from cells.
- In a non-receptor manner that facilitates the ABC I protein: it participates in the transport of cholesterol from the cytoplasmic membrane of the cell to the HDL

If HDL arises from chylomicrons or VLDL:

Cholesterol is esterified with the HDL-associated enzyme **[[LCAT] lecithin cholesterol acyltransferase]]** (LCAT). The liver can specifically uptake cholesterol-containing HDL particles by receptor-mediated endocytosis. This is the very principle of reverse transport.

High HDL cholesterol levels are a good prognostic factor for the development of coronary heart disease. That's why it's also called "good" cholesterol. The opposite is LDL (low density lipoprotein), which is highly atherogenic and is nicknamed "bad" cholesterol.

## Cholesterol storage in cells

Cholesterol is commonly stored in the form of droplets in the cytoplasm. If there is an excess of cholesterol and the cell needs to get rid of it via HDL, the cholesterol ester must first be hydrolyzed with the enzyme cholesteryl ester hydrolase. Free cholesterol is transported to the cell membrane, where it can be taken up by HDL particles.

## Summary

The most important function of HDL is the uptake of cholesterol from the surface membranes of tissue cells. As a result, the amount of cholesterol in the cells is reduced. HDL plays a vital role in the metabolism of lipoproteins and their proper function ensures optimal cholesterol balance and prevents its accumulation in tissues.

## Links

### Related Articles

- Lipoproteins
- Cholesterol

### References

- MATOUS, Bohuslav, et al. Basics of medical chemistry and biochemistry. 2010. edition. Prague: Galen, 2010. 0 pp. ISBN 978-80-7262-702-8 .

