Importance of Cholesterol in the Body

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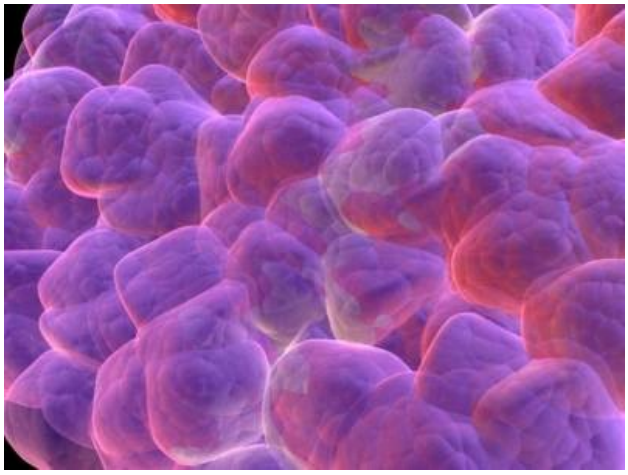

Mention the word "cholesterol" and the first thing that enters people's minds are all the forbidden ingredients contained in their favorite foods, especially the foods they're not supposed to eat. They might be surprised to learn that cholesterol is actually an important element for sustaining life. Without it, our bodies would cease to function.

All of the cholesterol a body needs is manufactured by the liver. Cholesterol is important for developing cell membranes, learning new skills, remembering facts, digesting, manufacturing hormones and synthesizing vitamin D.

Cholesterol and Cell Membranes

The human body contains millions of cells, and cholesterol is found in every one of them. Without it, the cells' membranes would not maintain their shape and structure. Cholesterol also helps different types of cells communicate with one another so that the body functions properly.

Cholesterol gives cells the unique ability to both attract and repel water soluble fluids. Sandwiched between two layers, cholesterol works in conjunction with hydrophilic (i.e., water attracting) and hydrophobic (i.e., water repelling) phospholipids. The combination of cholesterol and phospholipids lets cells allow fluids to move in and out and helps maintain their structure.

Sleep, Memory and Learning

With all of the focus on lowering cholesterol, either through diet or cholesterol-lowering drugs, it may come as a surprise to learn that cholesterol can positively affect memory and learning patterns. Studies have shown that cholesterol can enhance the ability to formulate new activities and memories during sleep while creating neurons called synapses. The synthesis of cholesterol that occurs during regular sleep cycles helps to cement these into a person's permanent behavior by creating new synapses. Cholesterol is also a major component of myelin sheaths that surround nerve tracts and conduct nerve impulses.

Cholesterol-and-health.com cites some interesting studies being performed with cholesterol-lowing drugs called statins. Just as cholesterol can help to create new synapses during sleep, taking statin drugs can lower the number of synapses. The answer could be to create new statin drugs that do not pass through the blood brain barrier, where they can inhibit the the number of new synapses.

Cholesterol and Digestion

The most important function of cholesterol in digestion is the ability to break down fats. The liver produces bile salts that are secreted into the duodenum (i.e., the upper section of the small intestine). The ileum (i.e., the lower part of the intestine) reabsorbs 95 percent of bile salts, where they enter the blood stream, attach themselves to a blood protein called albumin and return to the liver.

Bile salts leave the liver as bile acids and contain water-soluble and water-insoluble parts, making them emulsifying agents that allow them to mix with both water and fat-based fluids. After eating fat contained in food, the digestive tract depends on emulsifying agents to digest the fats.

Cholesterol and Steroids

Naturally occurring cholesterol is important in the production of several types of hormones. These include glucocorticoids, mineralcorticoids and sex hormones.

Glucocorticoids are important in the regulation of blood sugar.

Mineralcorticoids help balance mineral levels and regular blood pressure.

Cholesterol is critical in the production of pregnenolone, which in turn is converted to progesterone. Progesterone is is converted into Cortisol, which helps to manage inflammation and egulates aldosterone, which adjusts the balance of minerals, manages blood pressure and regulates testosterone levels, critical in libido and muscle mass in men and women. It also plays a role in converting testosterone to estradiol, also known as estrogen.

Synthesizing Vitamin D

Whether you spend all day inside the office or enjoy days filled with sunshine, it's important to get the recommended daily dose of vitamin D. Cholesterol plays a major role in supplying your body with vitamin D. Exposure to sunlight is required to convert cholesterol to vitamin D. Avoiding sunlight will reduce your body's ability to perform this task. Vitamin D is one of the best sources of calcium for maintaining good bone health. Studies cited by retired Harvard biology professor John W. Kimball in his Kimball's Biology Pages demonstrate that it is also important for mental health, regulating blood sugar levels, preventing cancer and enhancing the immune system.