

The Benefits of Cholesterol

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Cholesterol is not only the most common organic molecule in the brain, it is also distributed intimately throughout the entire body. So how did cholesterol come to have such a bad reputation?

For me it was those rabbit studies that seemed to prove cholesterol causation of atherosclerosis. I had just graduated from medical school in 1955 when someone demonstrated that if you fed rabbits cholesterol enriched pellets they got severe atherosclerosis.

If you took away the cholesterol enrichments, the atherosclerosis went away. If you restarted the cholesterol enrichment, the atherosclerosis reappeared. What better proof could one have? What more did I need? So I, like thousands of my peers around me, became staunch advocates of cholesterol causality.

Then, over 40 years later, Dr. Kilmer McCully revealed the truth in his book, *The Homocysteine Revolution*. Natural cholesterol is harmless Kilmer wrote but if you allow it to sit around uncovered it rapidly becomes oxidized to its oxy-cholesterol cousin, which is highly toxic. He went on to describe how he could inject natural cholesterol into arteries with impunity but to inject oxy-cholesterol created atherosclerosis every time. The explanation for the rabbit studies was so simple. Fifty thousand other doctors had fallen for cholesterol causality just as I did.

(Note from David Getoff, CCN another problem with the rabbit study is that rabbits are 100% vegetarian animals, unlike omnivorous humans, and so their systems would not have had any reason to develop adaptations for the healthy consumption and metabolism of dietary cholesterol which is an animal molecule and does not exist in any plant

Dr. McCully referred me to Dr. Uffe Ravnskov and his book **The Cholesterol Myths** and I finally had the truth. The cholesterol causation theory was wrong. Many doctors have a great deal of trouble accepting this new reality, which demands they admit to having been wrong for much of their medical practice. It is very difficult to admit this to your patients when they may have buried a parent with dementia that started shortly after they started on a statin or became incapacitated with disabling myopathy. Sometimes you do not wish to hear the truth and will defend your actions regardless.

Pfrieiger's landmark publication of the vital role of cholesterol in the formation and function of memory synapses (http://www.eurekalert.org/pub_releases/2001-11/m-brd110401.php), has been followed by one research report after another documenting the importance of cholesterol and our wide ranging demand for cholesterol in so many of our vital bodily functions, including nerve, muscle and even personality.

In history, cholesterol became an important evolutionary player when simple cellular organisms began evolving into the complex eukaryotic cells that gave rise ultimately to humans. The complexity of animal cells would not be possible without all the membrane structures that define the components of our cells.

The nucleus, the mitochondria, the cell walls, the Golgi apparatus and the endoplasmic reticulum are all parts of our cells contained in bi-lipid membranes. These bi-lipid membranes are a double layer of molecules with a fatty middle (lipophilic) and a water-attracting outer layer (hydrophilic).

While these membranes are basically the wrappers, they are also very dynamic, functionally active structures. They support and wrap the cell's contents. They control all lipid traffic into and out of the cell and its organelles (internal cell parts). To do this these membranes needed to be flexible, strong and changeable.

A molecule was needed to move around the cell membrane, organizing and changing the bi-lipid layers in support of all its cellular functions. Only one molecule was uniquely suitable for this role—we call it cholesterol. Almost all our cholesterol is found in our cell membranes. An average of 20% of all the molecules in our cellular membranes is cholesterol.

Over the past decade there has been a huge increase in the research publications documenting the action of cholesterol-rich structures within these membranes. Lipid research now describes an amazingly busy schedule for our membrane-cholesterol molecules. Saying that our bodies run on cholesterol comes very close to describing what has been learned just in the past few years.

Additionally, cholesterol is the precursor for a whole class of hormones known as the steroid hormones that are absolutely critical for life as we know it. Such hormones include estrogen, progesterone, testosterone, aldosterone, cortisol and calcitrol (vitamin D). These hormones determine our sexuality, control the reproductive process, and regulate blood sugar levels and mineral metabolism.

Beyond this, there is yet another class of cholesterol's steroid offspring without which our metabolic well-being might be in serious jeopardy: the production of bile acids. Bile makes it possible for us to emulsify fats and other nutrients. Without bile, we could not digest and absorb the fats in our diet and would slowly starve.

More recently, biochemists have revealed cholesterol's role in preventing electrochemical leakage of mitochondrial ATP (adenosine triphosphate—a molecule responsible for cellular energy) stores in cells throughout our body. Low cholesterol or any process that artificially lowers membrane cholesterol below natural limits must interfere with ATP storage due to the ever present sodium ion leakage and of electrochemical gradients.

This insulation role of cholesterol also extends to providing the myelin sheathing of our nerves that minimize loss of signal strength and “short circuits”. Multiple sclerosis is the term for a disease where we lose this myelin insulation around our nerves and suffer the consequences of multiple short circuits.

Other scientists have demonstrated the role of cholesterol in the processes of endocytosis and exocytosis so vital to cell function. What we have learned of cholesterol just in the past five years makes us wonder how we could have been so wrong for so long. **It is as if most of the scientific research community has closed its eyes tightly so as not to see the damage wrought by billion dollar drugs.**

These drugs soon grew to have a life of their own, almost completely unstoppable, guiding well-meaning doctors down dark paths while subtly enhancing the aging process with muscle weakness, easy fatigue, poor balance, painful extremities, depression and impoverished memory. Slowly, the more astute physicians are awakening to the fact that, far from being our enemy, cholesterol is what makes life possible.

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July 2013