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P.O. Box 56507 Houston, Texas 77256 • 1-713-298-8783

CHOLESTEROL INSIGHTS: **A New, Life-Systems Engineering Science Discovery**

Brief History: I thank my colleague, EFA / eicosanoid specialist Paul Beatty, Toronto, Canada for this brief history regarding cholesterol: In 1958, Ancel Keys published the historic “**7-Countries Study**,” showing a linearly increasing cholesterol level / increasing heart disease connection. ***He misled the world*** by not including many other countries where this correlation does not exist and would have contradicted his hypothesis. Furthermore, *he made no distinction in the quality* of fats / oils being critical to human health — he incorrectly stated that all fats raise cholesterol — especially, saturated fats. **To the contrary, unprocessed / fully functional EFA-containing plant- and seed-based oils lower LDL-cholesterol.**

Keys’ misleading and wrong conclusions were opposed by at least 3 prominent researchers — Hugh Sinclair and Kinsell & Groen in 1952. Sadly, Keys ill-founded argument won the day. This was the beginning of the “no/low fat hypothesis” (*guess*) and the beginning of calling the absolutely required cholesterol [*Textbook of Medical Physiology*], “the enemy.” To this day, the majority of healthcare practitioners in the medical community are still misled in this area, as are their patients.

INSIGHTS:

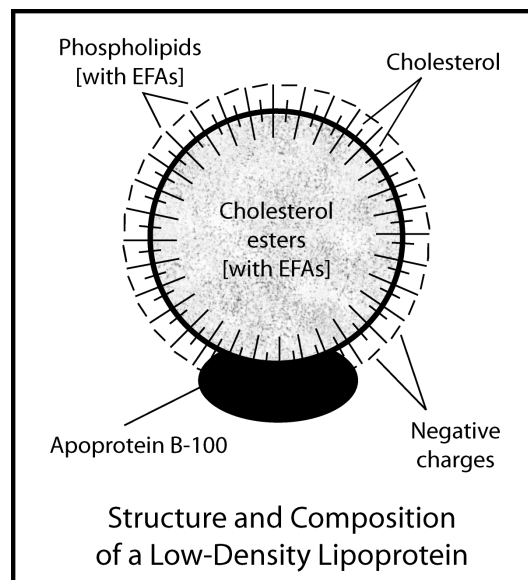
1. **There is no cholesterol sensor in the bloodstream.** No, this is not a “genetic defect.” There are sensors for maintaining blood glucose (0.1% tolerance across all patients unless diabetic), sodium level, potassium level, etc. Given a system of n-1 linear equations with n independent variables (and no other conditions), there must be 1 degree of freedom; LDL-C will be dependent on virtually everything else. Utilizing a biological systems approach, cholesterol can be viewed as a dependent variable.

Novel lipids-based pharmacognosy solutions

LDL-C's absolute number, therefore, is irrelevant. This explains a lack of a required sensor to fix a set amount in the bloodstream. Furthermore, in addition to healing cardiovascular abnormalities, cholesterol has no less than 10 critical functions in the body, (*Textbook of Medical Physiology*). Pre-1990 LDL-C was never considered “bad.”

2. **Other than healing an impaired vascular issue, does cholesterol have other important functions? YES.** Via *esterification*, LDL-C is the transporter of Essential EFAs (linoleic acid (LA) and alpha-linolenic acid (ALA) — the only 2 essential fatty acids). “**Esterification**” is a condensation reaction (the water is removed) – think of the Essential EFAs being “magnetized” to the cholesteryl molecule for transport in the bloodstream.

“80%-90% of the dietary cholesterol absorbed is esterified with long-chain fatty acids in the intestinal mucosa” (*Harper's Illustrated Biochemistry*). Approximately 55% of the esterified portion is Essential omega-6 – LA in both LDL-C and HDL-C, and about 20% of the free fatty acids in each class (Sinclair). “**LA, [Essential omega-6] is one of the most abundant fatty acids in LDL-C.**” (Bowen, *Current Atherosclerosis Reports*; 6:477-484,2004). We see the structure in apolipoprotein B (Apo B) below:



Textbook of Medical Physiology, pg 874

3. **Why is this esterification of the cholesteryl molecule to the Essential EFAs critical to the understanding of the action of statins?** Because, due to ubiquitous food processing, all cooking oils contain significant amounts of **highly chemically processed**, nonfunctional seed oil's LA (*transformed from active to functionally impaired* via harmful trans fats / interesterified fat formation, etc.). Therefore, when LDL-C is reduced, its nonfunctional / adulterated LA it transports is also REDUCED, which is very good. **HOWEVER, at the same time, the fully functional, vitally important (esterified) LA is REDUCED — very, very bad.** In fact, “all-cause” mortality would be expected to significantly increase in statin users; and it does increase (e.g., increased cancer and diabetes).
4. **Fully functional LA is critical to each of your 100 trillion cells.** Fully functional LA in the cell membranes allow hormones — including insulin — to be more effectively utilized (less insulin resistance). Essential EFAs comprise 25% - 33% of each of the 100 trillion cellular membranes in tissue and organs (Molecular Biology of the Cell). Mitochondria are loaded with LA in the cardiolipin, too (Harper's Illustrated Biochemistry / Textbook of Medical Physiology). There is significantly more LA than ALA in every cell membrane regardless of organ — 4Xs-6Xs more LA than ALA, as well as dominating plasma lipids (Spector, Chapkin, Markides, Anderson).
- Fully functional LA is also critically important for maximizing CELLULAR OXYGENATION (Campbell) — and lack of / impairment of (cellular) oxygen transport is known to be highly cancer-causing — the *prime cause* of cancer (Warburg).
5. **Does reduction of LDL-C's (esterified) LA cause additional problems?** Yes. Statins are sometimes *claimed* to possess a mild anti-inflammatory action; however, LA's long-chain metabolite — **PGE₁** — is the **body's most potent natural anti-inflammatory**. **Statin use impairs its production.** PGE₁ is also known to reverse existing arterial occlusions / thromboses (Weiss) and is a potent

natural vasodilator which increases blood flow — all helping to prevent CVD. **Statins decrease both of these positive effects.**

6. **Why is LA adulterated in the diet?** To obtain longer shelf-life and allow long-term use in commercial restaurant baking and frying. Use of cooking oils from the super-market cause shorter lifespan in humans because of processed cooking oils' significantly impaired LA functionality. Note: Essential omega-3 oils, like flax oil, is never used in cooking or baking.

7. **The intima — inner lining of the artery is 100% exclusively made of LA** (Chapkin, et al.). Therefore, if there is less of the raw substrate (LA) that is fully functional, the patient has a defective arterial lining. If the patient is consuming processed foods (as the vast majority do), he will also have an increase in defective intima and defective / functionally impaired cell membranes throughout all organs / tissues. Furthermore, virtually all medical textbooks, including the medical standard — *Textbook of Medical Physiology* — state the intima is a mere 1 cell thick. This is incorrect; the intimal structure is actually 8-10 layers thick. [Note: esteemed pathologist, V. Subbotin, MD, PhD, came across my work and sent me a journal article with high-resolution photography confirming the multi-layer structure of the intima]. **The intima is “self-inflaming” because of the ubiquitous use of processed LA.**

Therefore, with defective / adulterated / nonfunctional LA there is in actuality up to 10x more chance of impairment to the inner multi-layer arterial wall and its structure; particularly, large arteries.

IF available, (Esterified) Cholesterol transports fully functional LA to the arterial wall in an attempt to repair defects. Dead macrophages *filled with cholesterol esters* are finally deposited in arteries (Spiteller).

8. **Exactly, what is oxidizing in LDL-C – the cholesteryl molecule itself or something else?** *The answer is “something else.”*

Cholesterol / cholesteryl molecule and LA are both HIGHLY RESISTANT to OXIDATION in the body.

There is a mere 1 antioxidant molecule per 165 PUFA molecules; in particular, LA— far too few “protectors” to oxidation (1:165), **IF** *in vivo* oxidation were a significant issue, **which it isn't** (Esterbauer, et al., 1991).

Note: Three double bonds are required before *in vivo* oxidation becomes an issue, and LA has only 2 double bonds (Peroxide Index (PI), AJ Hulbert) — it is *exclusively* the **adulterated / processed / nonfunctional LA** that the cholesteryl molecule is transporting that is oxidized exogenously (from consumed food).

This oxidized LA is NOT becoming oxidized in the body it is exogenous — coming in from consumed food already oxidized (Spiteller).

- 9. What comprises an arterial occlusion (clog)?** High resolution chromatography confirms the occlusion is approx. 85% nonfunctional / adulterated / processed LA (Waddington / Kuhn / Felton).
- 10. Can increasing HDL solve the problem.** Given the analysis above, no, not at all.

SOLUTION: Consuming fully functional LA & ALA (the Essential EFAs) each day is the only answer – it's easy and the problem is solved.

Keto followers: Since fully functional / unadulterated LA and ALA are long-chain (18-carbon), not medium- or short-chain fatty acids, you are likely deficient in them.
