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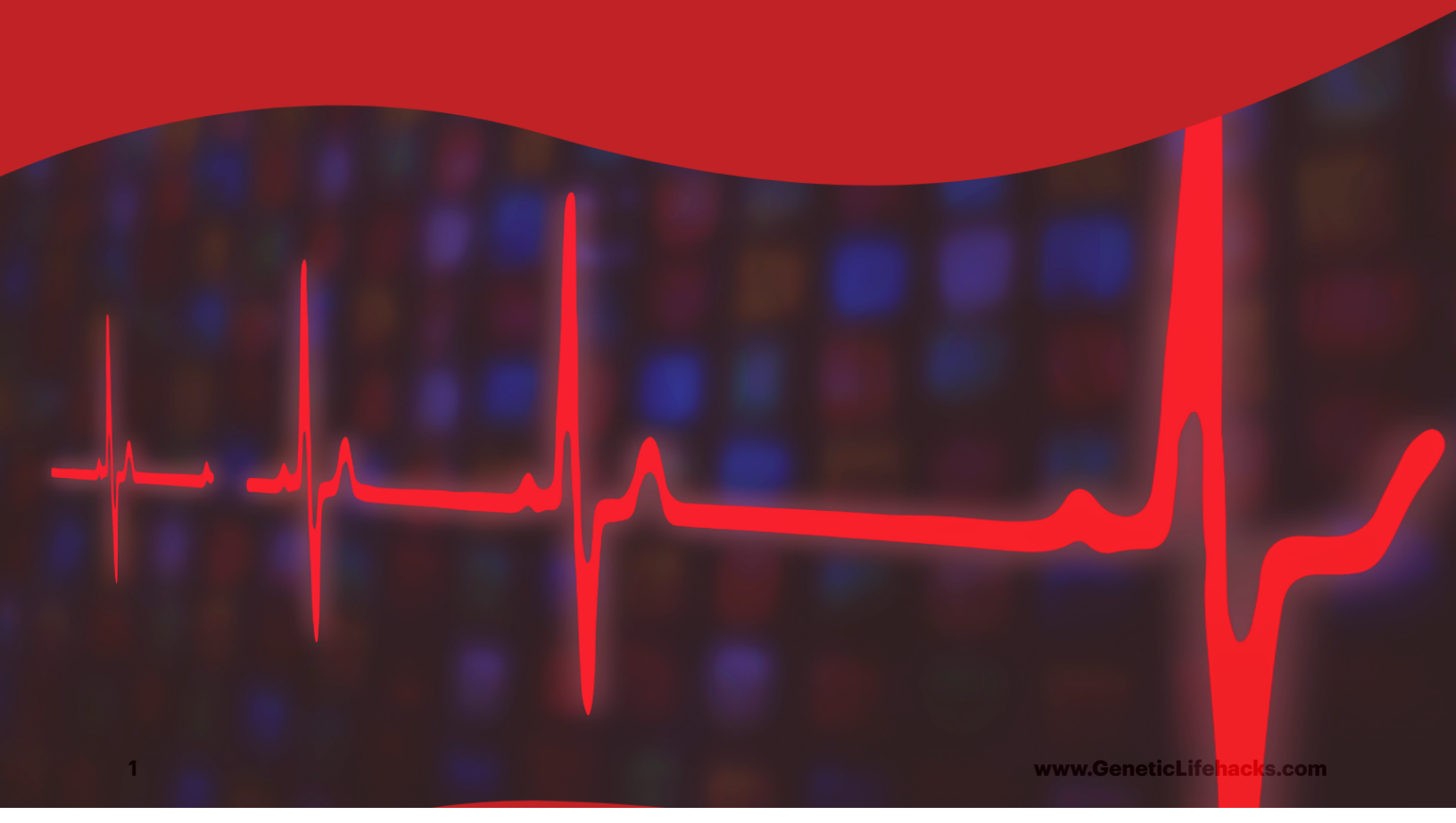
Lipoprotein (a)

CARDIOVASCULAR DISEASE AND STROKE RISK



WHAT IS LIPOPROTEIN A?

Lipoprotein(a) or LP(a) — said "L- P- little a" — is a blood particle that carries LDL cholesterol and proteins. Elevated levels of Lp(a) are a strong risk factor for having a heart attack due to atherosclerosis.[ref]

We all know that fats and water don't mix. It remains true in the body regarding moving around fats in the bloodstream. The term lipoprotein is a general term for a glob of fatty acid plus protein that is packaged so it can easily be transported throughout the body. Lipoproteins include low-density and high-density cholesterol.

Lipoprotein (a) includes an LDL particle bound to an apolipoprotein (a) – known as apo(a) – and apoB100. The apo(a) part is what increases atherosclerosis. It also promotes clotting by interfering with the way that the body dissolves clots.[ref] So, you have a double-whammy of increasing atherosclerosis via increased inflammation plus oxidized LDL. The LDL tends to oxidize once inside a vessel wall adding more inflammation responses because their structure has changed. It all adds to a mechanism that increases the risk of blood clots.[ref]

The Lp(a) molecule can vary a lot in size, and you can inherit two different sizes of Lp(a) – one from mom and one from dad.[ref]

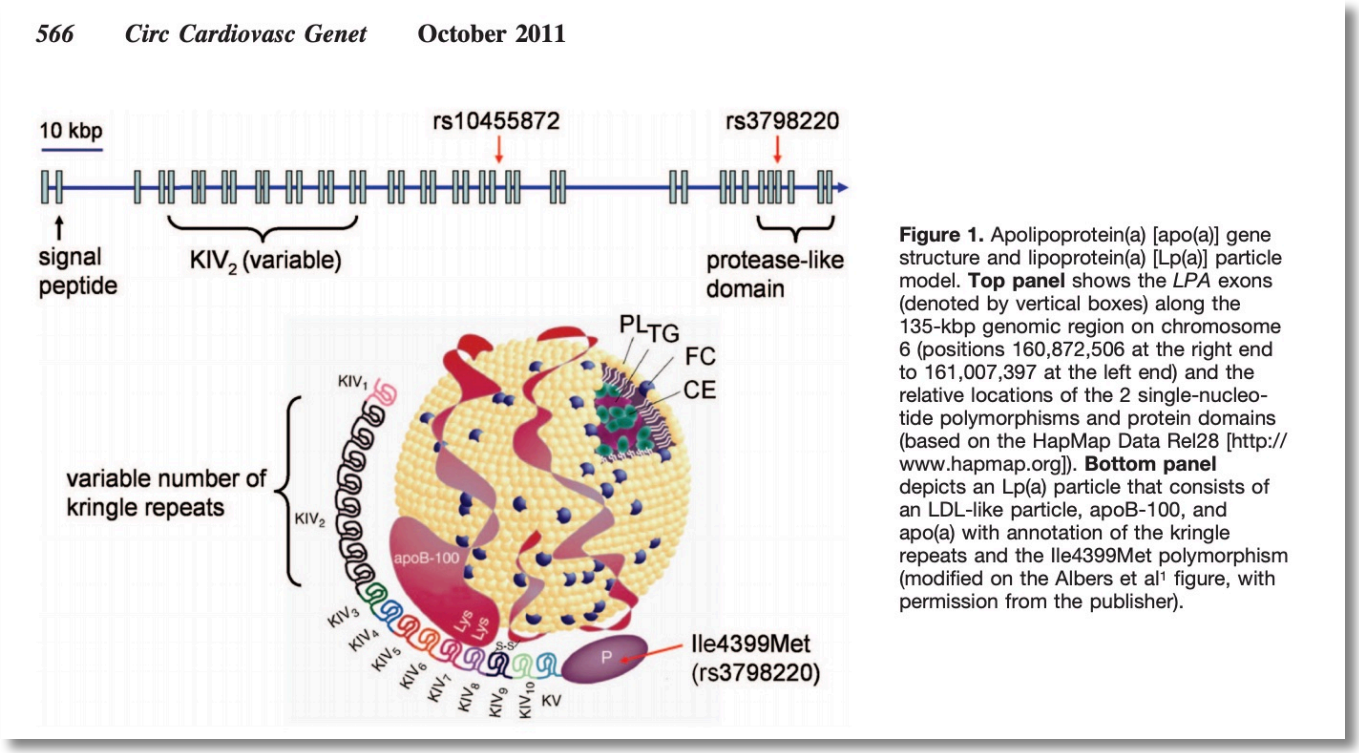


Figure 1. Apolipoprotein(a) [apo(a)] gene structure and lipoprotein(a) [Lp(a)] particle model. **Top panel** shows the *LPA* exons (denoted by vertical boxes) along the 135-kbp genomic region on chromosome 6 (positions 160,872,506 at the right end to 161,007,397 at the left end) and the relative locations of the 2 single-nucleotide polymorphisms and protein domains (based on the HapMap Data Rel28 [http://www.hapmap.org]). **Bottom panel** depicts an Lp(a) particle that consists of an LDL-like particle, apoB-100, and apo(a) with annotation of the kringle repeats and the Ile4399Met polymorphism (modified on the Albers et al[1] figure, with permission from the publisher).

Screenshot - see this Detailed article on Lp(a)

Lp(a), Bob Harper, and the risk of a sudden heart attack:

The Biggest Loser host and fitness trainer, Bob Harper, has been open about his recovery from a very serious heart attack in 2017. He was the epitome of healthiness – fitness trainer, nutritional guru, athlete, and only in his early fifties. But he also had **genetically elevated levels of Lp(a)**. Here is a Today Show interview where he explains some of his recovery and what he is doing to prevent a second heart attack.

A recent study in India showed that high Lp(a) levels – defined as >50mg/dl) increased the risk of coronary artery disease in younger people by 2 to 3-fold.[ref]

IS LIPOPROTEIN(A) HERITABLE?

"Family history" is always mentioned by the doctor as an important indicator of your risk of heart disease, especially if a family member had a heart attack at a young age. Lp(a) is often the reason that this question is asked.

A significant way that researchers have found family history playing a role is through the inheritance of a genetic variant that increases lipoprotein(a).

Lp(a) levels are estimated to be **90% hereditary**. (That's really high when it comes to hereditary estimates!)[ref]

Is Lp(a) a big deal – or just another scare tactic?

There are questions and controversy on the role cholesterol plays in heart disease, which may lead some people to dismiss Lp(a) as just the latest number to talk about. I think it would be a big mistake to dismiss the research on Lp(a).

There is abundant research that *high* Lp(a) *increases* the risk for:[ref][ref][ref][ref]

- sudden heart attack
- narrowing of the arteries
- stroke
- aortic stenosis.

Additionally, *low* Lp(a) levels are linked with a *lower* risk of heart failure, stroke, vascular disease, and aortic stenosis.[ref]

The kicker: Genetic studies show that variants linked to high Lp(a) correlate to a shorter lifespan. When averaging together information from more than 100,000 people, the presence of an Lp(a) genetic variant caused an average decrease in lifespan of 1.5 years. [ref]

HOW HIGH IS HIGH?

When you get your Lp(a) test results, how do you know if it is just slightly high or seriously scary?

- One study shows a 3x risk of aortic valve stenosis for those with Lp(a) levels greater than 90 mg/dl.[ref]
- Another source says normal Lp(a) levels are less than 30 mg/dl (or 75 nmol/L).[ref]
- Some researchers consider normal to be less than 50 mg/dl.[ref][ref]

It is important enough to talk to a doctor about and keep up with the research as it comes out.

NOT ALL STUDIES AGREE... AS USUAL

A study on women found that Lp(a) levels were only important in cardiovascular disease if the women also had high cholesterol (>220 mg/dl).[ref]

A 2012 study in people with diabetes found that higher Lp(a) levels did not correlate with an increased risk of heart disease. Note that there was no additional risk above the high risk from having diabetes.[ref]

One problem with the epidemiological studies on Lp(a) is that most of them only last for 5 to 10 years, which may not be enough time to really determine causality.

LIPOPROTEIN (A) GENOTYPE REPORT

The LPA gene controls the formation of the lipoprotein(a) molecule. Variants in the gene cause the body to create more Lp(a).

These first two genetic variants cover about 40% of the variation in Lp(a) levels — other, less common variants also raise Lp(a) levels.

Genetic variants that increase LDL cholesterol levels are also linked with higher Lp(a) levels. It makes sense that there could be more Lp(a) if your cholesterol levels are really high.

The genotype report section is found in the full article: https://www.geneticlifehacks.com/lipoproteina-a-big-genetic-risk-for-heart-disease/

LIFEHACKS:

So what do you do if you carry the risk alleles for high Lp(a)? Knowledge is power here!

Lp(a) blood tests:

Talk to your doctor about getting an Lp(a) blood test done. It may be covered by insurance in your annual well-check, especially if you have a family history of early heart attacks.

I know **a portion of my readers will ignore that advice** and tend not to like to talk to their doctors. You can get a test done for Lp(a) in the US without going through your doctor. You can order the test online through Ulta Lab Tests (affiliate link) or other online lab

companies. UltaLab Tests is often the cheapest, and the Lp(a) test currently costs $29. (Shop around since other online lab test companies often run specials or may have more convenient locations for the lab draw.)

Seriously, the only way to know your Lp(a) level is to get it tested.

Therapies to talk with your doctor about:

High Lp(a) isn't just something to live with. You do have options here. In fact, a couple of therapies for high Lp(a) have been well studied — as well as new drugs in trials to target it.[ref]

Aspirin:
A study of over 12,000 people over age 70 looked at the effect of 100mg of aspirin daily. The researchers found that those with the rs3798220 C allele were at an almost double risk of 'major adverse cardiovascular event' in the placebo arm, but that risk was mitigated in those participants receiving aspirin.

A study of over 20,000 women looked at the effects of **aspirin** on heart disease. The study results showed that those women who carried one or two copies of the LPA risk allele cut their heart attack risk with aspirin therapy. (Women without elevated Lp(a) did not have a statistical benefit from aspirin.) The whole study is available here.

Apheresis:
In apheresis, your blood is run through a machine to remove the LDL particles. It is considered effective but expensive and inconvenient.[ref]

Statins vs PCSK9 inhibitors:
Taking a statin has been shown to elevate Lp(a) levels a little bit. The newer cholesterol-lowering medications, **PCSK9 inhibitors,** have been shown to lower Lp(a) levels.[ref]

Keep up with new research: Phase III clinical trials are underway for a new medication that targets Lp(a) with an antisense oligonucleotide.[ref]

Natural options for lowering Lp(a):

Niacin:
Vitamin B3 – niacin – has been used for decades to lower the risk of heart disease. Studies show that 1 -3 g/day reduces Lp(a) levels by an average of 30-40%.[ref][ref][ref] Most studies use the type of niacin that causes flushing.

Lowering cholesterol:
Overall, lowering your LDL cholesterol numbers can help lower Lp(a) some since Lp(a) is the carrier for LDL. Here is a good article on it from the Cleveland Clinic.

How do you **lower your cholesterol with diet?** That seems to be the million-dollar question. A more whole-food, plant-based diet, in comparison with a higher meat/fat-based diet, works to lower cholesterol *for some people*. You may need to try out several diets – Mediterranean, DASH, etc. – and test to see what works for your body.

Ginkgo Biloba:
One study showed Ginkgo Biloba reduced Lp(a) levels. The study participants took 120mg twice a day, which resulted in a 23% decrease in Lp(a).[ref]

Berberine:
Berberine has been shown to decrease cholesterol levels as well as Lp(a) levels.[ref][ref] Read through my article on berberine for more info as well as ways to increase absorption.

Dietary changes:
A clinical trial showed a 'defined plant-based diet' for 4 weeks lowered Lp(a) by an average of 16% (along with reducing total cholesterol by 16%) The diet consists of fruits, vegetables, nuts, seeds, and whole grains – with 1oz of meat per day. The study notes that the amount of decrease in Lp(a) is similar to that of using niacin or a PCSK9 inhibitor.[ref]