

## Atherosclerosis-- Is Your LDL Sticky?

Ronald Grisanti D.C., D.A.B.C.O., DACBN, MS, CFMP

**Atherosclerosis is thickening or hardening of the arteries caused by a buildup of plaque in the inner lining of an artery.**

For as long as I remember most people including myself have been told that LDL cholesterol is the bad villain of plaque build-up and HDL cholesterol is the good guy.

Of course with this hypothesis it would make perfect sense that the higher your LDL cholesterol the greater the chance of getting atherosclerosis.

However there is much more to the story and my hope today is to share a different angle that will shed some light on the real issues with LDL cholesterol and its nemesis called atherosclerosis.

### The Significant Role of LDL in Our Bodies

Cholesterol isn't inherently bad. In fact, it's the building block for creating healthy cells. It also helps your body make testosterone and estrogen. Without LDL, these and many other steroid hormones wouldn't be made effectively

Contrary to what we have been told, LDL cholesterol also has another good side and that is its **ability to fight infections.**

LDL plays a valuable and important role in the body's response to assault by infectious invaders. When bacteria invade our body, they release a cell wall component known as **endotoxin**. What is critically important and something we will dig in deeper in this article is the fact that endotoxins are **super inflammatory and can strongly trigger the immune system.**

But research has shown that your friend LDL cholesterol is around to bind up this toxin preventing things from getting out of hand.

In a study using mice it was discovered that increased levels of LDL cholesterol were eight times more resistant to endotoxins. This showed a significant decrease in overall mortality when injected with gram negative bacteria. On the other hand rats with the lowest LDL cholesterol had an increase rate of mortality and levels of inflammation when injected with endotoxin.

Now if you are like me I would be asking, what about humans?

Is there evidence that higher levels of LDL cholesterol is protective against infections in humans. In fact there are many studies proving that higher levels of LDL cholesterol are protective as we age. This is more likely due to the positive impact on the immune system.

The answer is that LDL itself is not harmful, but in certain situations can be involved in the process of responding to injury and inflammation. This of course makes LDL look like more of a firefighter than simply a criminal causing atherosclerosis.

So the question that we must ask ourselves is: **Is there something more sinister behind the scenes that is actually driving heart disease (atherosclerosis)?**

As I have discussed in a prior article the real issue is **insulin sensitivity and the stickiness factor.**

In people who are **insulin sensitive**, rising LDL levels **do not** correlate with increased rates of heart disease. On the other hand in those who are insulin resistant, the higher the LDL the greater opportunity for plaque formation. Remember it is not all about elevated levels of LDL but the more important villain of **insulin resistance.**

What will make our head spin is the fact that higher levels of LDL in the blood do not consistently correlate with the progression of atherosclerosis in the **absence of insulin resistance.**

### LDL Stickiness is the Real Issue

Here is the important take away from this important article. LDL under certain circumstances (which I will mention in a minute) have the ability to **get stuck** within the arterial wall. So it is not the size or amount of LDL particles moving into the arteries that is important but rather if it sticks to the wall of the artery that determines whether or not it contributes to atherosclerosis.

**Here is a good analogy:**

If you were to throw a tennis ball at a wall, unless the tennis ball and the wall were coated in velcro the tennis ball would not stick. So to bring it back to reality, unless the LDL particle and arterial wall (the intimal space) were sticky, it does not matter how many LDL particles we have floating around in our arteries, the LDL "balls" only get stuck to the arterial wall when they are coated in what we will call "**molecular velcro**". LDL is simply not enough of a problem alone to initiate plaque build-up. **The take away is:** it has to **get stuck** in the arterial wall to initiate the process of atherosclerosis.

[Plaque Build-up Due to LDL Stickiness](#)

### Now the magic question

#### What in the world determines how sticky the LDL particle and the intimal space are?

There is now growing evidence during states of **insulin resistance and inflammation** both the LDL particle and the arterial wall get coated in "**molecular velcro**" making everything more sticky increasing the progression of atherosclerosis.

You may now be asking: **really how common is insulin resistance?**

Would you believe that a massive **88 percent** of the American population has some degree of metabolic syndrome (insulin resistance).

#### So to conclude:

In the **absence of insulin resistance and inflammation**, higher levels of LDL cholesterol are probably protective because of their roles with the immune response.

#### References

<https://academic.oup.com/qjmed/article/96/12/927/1533176>

<https://pubmed.ncbi.nlm.nih.gov/14631060/>

<https://www.bmj.com/content/368/bmj.m1182/rr-21>

<https://pubmed.ncbi.nlm.nih.gov/7729918/>

<https://www.sciencedirect.com/science/article/pii/S0022227520333630>

#### Fat controversy

<https://pubmed.ncbi.nlm.nih.gov/7772105/>

<https://pubmed.ncbi.nlm.nih.gov/11259144/>

<https://diabetes.diabetesjournals.org/content/50/9/2126>

<https://pubmed.ncbi.nlm.nih.gov/18489581/>

<https://pubmed.ncbi.nlm.nih.gov/10978261/>

<https://link.springer.com/article/10.1007/BF00400234>

<https://www.liebertpub.com/doi/10.1089/met.2018.0105>

#### Carnivore Code by Paul Saladino MD

The information on this website is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Grisanti and his functional medicine community. Dr. Grisanti encourages you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.

Visit [www.FunctionalMedicineUniversity.com](http://www.FunctionalMedicineUniversity.com) for more information on our training in functional medicine. Look for practitioners who have successfully completed the Functional Medicine University's Certification Program (CFMP) [www.functionalmedicinedoctors.com](http://www.functionalmedicinedoctors.com). This content may be copied in full, with copyright, contact, creation and information intact, without specific permission, when used only in a not-for-profit format. If any other use is desired, permission in writing from Dr. Grisanti is required

