



## TAKE YOUR VITAMIN C REGULARLY

Vitamin C plays a critical role in human health, and we must take it in our diet or supplements since our bodies cannot produce it. Among the most important functions of vitamin C is protection of integrity and elasticity of blood vessels, and preventing formation of atherosclerotic plaques which are the underlying cause of heart attacks and strokes. The cardiovascular diseases result in millions of deaths each year. Low fat diets and cholesterol-reducing medicines have not been successful in addressing this issue.

In 1990, Dr. Rath published<sup>1</sup> a revolutionary concept that a chronic insufficiency of vitamin C damages blood vessel walls and triggers a “repair” process in which cholesterol-carrying lipoproteins deposit in the artery walls. With time, this “repair” process can lead to a buildup of atherosclerotic plaque. The most effective “repair” molecule is lipoprotein (a) [Lp(a)], which is produced in humans, but not in animal species. Dr. Rath observed an inverse relationship between the production of Lp(a) and vitamin C. Since humans lack the capacity to produce internal vitamin C, the Lp(a) can act as a functional surrogate for vitamin C by protecting the integrity of the blood vessels compromised during the times of vitamin C deficiency.

To study this issue, the researchers at the Dr. Rath Research Institute developed a unique mouse model {Gulo-/-; Lp(a)+} that mimics key aspects of human metabolism; these mice do not produce vitamin C and at the same time synthesize internally human atherogenic lipoprotein, the Lp(a). In one of our studies, we could demonstrate that a lack of vitamin C dietary intake is linked to significant increase in Lp(a) levels and its deposition in the arteries at the site of highest mechanical stress near the heart, leading to plaque formation. On the other hand, vitamin C supplementation resulted in decreased deposition of Lp(a) along the artery walls and low Lp(a)



blood levels. This confirms that Lp(a) can function as a repair molecule accumulating at the sites of damaged artery walls during vitamin C deficiency<sup>2</sup> and therefore is a risk factor for atherosclerosis. A significant role of Lp(a) in cardiovascular disease is well known, but there are no effective treatments to lower it.

In another study on the {Gulo-/-; Lp(a)+} mouse model, our researchers analyzed the effects of irregular intake of vitamin C on some indicators of cardiovascular health.<sup>3</sup> One group of animals consumed vitamin C continuously for 20 weeks, while the other groups received it at the same amounts, but intermittently. The mice with irregular intake of vitamin C had higher levels of total cholesterol and LDL (“bad”) cholesterol levels compared to mice on regular vitamin C intake. Moreover, continuous vitamin C intake was associated with 44% higher levels of HDL (“good”) cholesterol. What is more important is the mice taking the same levels of vitamin C but with interruptions developed significant blockages in the aortic wall which further increased each time the vitamin C was withdrawn.

Even though humans are aware of the importance of vitamin C in cardiovascular and other aspects of health, irregular intake of vitamin C is very common. Lower intake of vitamin C-rich foods in the winter correlates with a higher incidence of cardiovascular events. This incidence decreases in the summer as people consume higher amounts of vitamin C. Our studies provide an undeniable proof that continuous supplementation of vitamin C is essential for optimum cardiovascular health. Remember, take your vitamin C regularly!

#### Ref:

1. Rath M, Pauling L, Proc. Natl. Acad. Sci. USA 1990, Vol. 87, pp. 6204-6207,
2. Cha J, Niedzwieck Ai, Rath M; Am J Cardiovasc Dis 2015;5(1):53-62
3. Shi L, Niedzwiecki A, Ivanov V, et al., Int J Cardiovasc Res, 2018, 7:6

This information is provided to you by the Dr. Rath Research Institute a leader in the breakthrough of natural health research in the field of cancer, cardiovascular disease and other common diseases. The Institute is a 100% subsidiary of the non-profit Dr. Rath Foundation.

The ground-breaking nature of this research poses a threat to the multi-billion dollar pharmaceutical “business with disease”. It is no surprise that over the years the drug lobby has attacked Dr. Rath and his research team in an attempt to silence this message. To no avail. During this battle, Dr. Rath has become an internationally renowned advocate for natural health. Says he: “Never in the history of medicine have researchers been so ferociously attacked for their discoveries. It reminds us that health is not given to us voluntarily, but we need to fight for it.”

This information is based on scientific research results. It is not intended to substitute for medical advice to treat, cure, or prevent any disease.

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