

Octacosanol is a widely distributed natural higher aliphatic alcohol that can be isolated and purified from rice bran, sugarcane, wheat germ, beeswax, insect wax. Octacosanol exerts various biological effects, including anti-fatigue, anti-hypoxia, antioxidant, anti-inflammatory, antitumor.

It has the effects of regulating the body's immune function and energy metabolism and has potential benefits for cardiovascular disease, cerebrovascular disorders, diabetes, Parkinson's disease, and others.

Octacosanol is primarily responsible for regulating multiple signalling pathways such as AMPK, PI3K/Akt, and MAPK/NF- $\kappa$ B, to achieve different physiological functions.

### Lipid Metabolism

- The rapid weight loss through caloric restriction with high intensity exercise training seen in taekwondo was shown to decrease levels of HDL and increase levels of LDL and TG, which may eventually increase the risks for both metabolic dysfunction and cardiovascular disease (CVD) in these athletes. However, the OCT group showed an increase in HDL and a reduction in LDL and TG, demonstrating the beneficial effects of octacosanol to reduce the negative changes in lipid levels that occur from this kind of training.

Benefits in HDL:LDL ratio with acute fat loss and intense training (Quick contest prep???)

<https://doi.org/10.1123/ijsp.2018-0704>.

- Octacosanol inhibits a step in the cholesterol biosynthetic pathway, decreasing the esterification of fatty acid into triacylglycerol, decreasing serum triacylglycerol concentration. Benefits of incorporating into a high fat diet.

DOI: <https://doi.org/10.1079/BJN19950045>. (Rats 1995).

- Human trial with healthy volunteers, normal cholesterol. 10 mg/ 4 weeks reduced serum cholesterol. 20 mg/ 4 weeks decreased LDL and increased HDL.

<http://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=5279936> (1992).

- Octacosanol as an alternative to statins in kidney failure and altered liver function. Human trial more effective in improving the ratio of LDL:HDL. Benefits incorporating into elderly with type II hypercholesterolemia and high CAD risk. (Policosanol, 1999).

[PMID: 10939028](https://pubmed.ncbi.nlm.nih.gov/10939028/).

Octacosanol may have a role as a prophylactic treatment because cholesterol was lowered with octacosanol supplements when studied in healthy volunteers.

Research suggests that the benefits of octacosanol compared with statins are much more marked and major side effects of statins do not occur.

### Antiaggregatory properties

Inhibition of platelet aggregation should reduce thrombus formation and therefore prevent atherosclerosis development. Benefits in populations at risk of CAD events.

- Inhibition of arachidonic acid metabolism where  $\text{TxA}_2$  is formed.

[https://doi.org/10.1016/0049-3848\(93\)90030-R](https://doi.org/10.1016/0049-3848(93)90030-R). (Policosanol, Rats, 1993).

- 20 mg/d of policosanol daily is as effective as 100 mg/d of aspirin, but no side effects were noted. (Humans, 1997).

<https://doi.org/10.1006/phrs.1997.0201>.

### Erythrocyte volume and blood viscosity

Additionally, octacosanol decreased polycythaemia and blood viscosity, increased total haemoglobin concentration, and improved microcirculation.

- Thirty-eight healthy young men on the plateau were selected as subjects who had lived for more than 1 year at an altitude of 3700 m and were treated with octacosanol capsules (10 mg/day) for 30 days. The results showed that octacosanol reduced hypoxia-caused erythrocytosis, decreased the concentration of haemoglobin, and increased blood oxygen saturation during exercise. (Military personnel).

F.Y. Liu, Q.Q. Zhou, J.H. Cui, Y.J. Luo, W.G. Liao, W. Wang, *et al.* (2009) Field experiments of effects of octacosanol on military operation capacity at high altitude. *Medical Journal of National Defending Forces in Southwest China*, 19(7), pp. 670-671.

### Athletic performance

May improve stamina and exercise capability.

AMPK is a "cellular energy regulator", and it has been confirmed that octacosanol can increase the mRNA expression level of AMPK, thereby affecting energy metabolism. Research has shown that octacosanol may be an effective drug for the prevention and treatment of plateau hypoxia.

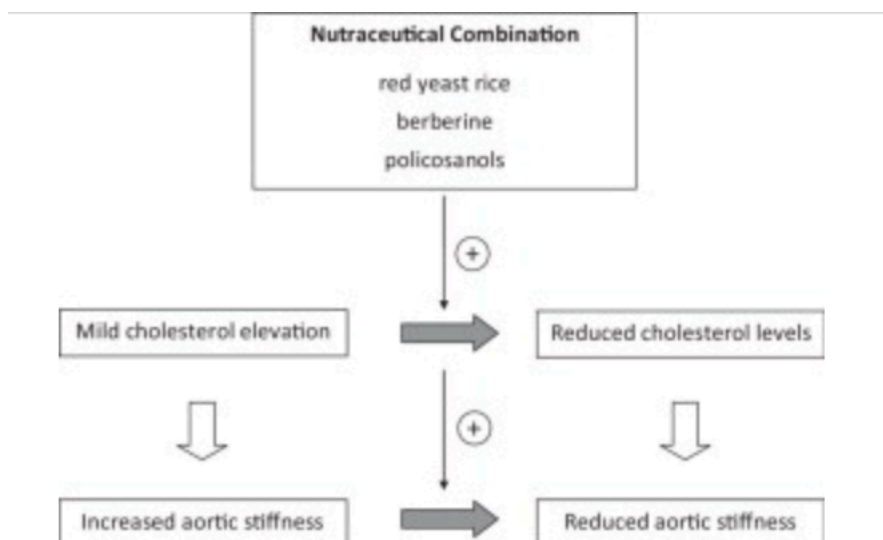
- 1000 µg of octacosanol significantly improved grip strength and reaction time in response to a visual stimulus. This suggested that octacosanol also exhibits properties affecting the nervous system because reaction time would change according to nerve impulses throughout the body.

M. Saint-John, L. McNaughton (1986) Octacosanol ingestion and its effects on metabolic responses to submaximal cycle ergometry, reaction time and chest and grip strength. *International Clinical Nutrition Review*, 6, p. 81.

### Arterial Wall Stiffness

There is an association between cholesterol reduction and aortic stiffness. (My thought: + Improved endothelial function via the antioxidant properties too). (My thought: + Perhaps reduced systolic BP due to reduced hypercholesterolemia?).

Arterial stiffness is increasingly recognized as a surrogate end point for cardiovascular disease and is a strong predictor of future cardiovascular events and all-cause mortality. Hypercholesterolemic patients have frequently stiffer large arteries than normocholesterolemic subject and cholesterol reduction may have a role in reducing large artery stiffness.



- 70 patients, LDL > 3.4 mmol/ L. 2-month therapy with a combination of red yeast rice, berberine (500 mg) and policosanol (10 mg) reduced aortic stiffness by 9% and a significant 20% reduction of LDL cholesterol. (Didn't measure HDL:LDL ratio).

<https://doi.org/10.1016/j.phanu.2013.02.003>

NOT relevant for this but stand-alone/ longevity formulation supp?

In addition, studies have shown that octacosanol has anti-aging potential. Long-chain [fatty alcohols](#) (which contain chain lengths of 600.0–700.0 octacosanol) obtained from sugarcane wax facilitated faster cell growth and replication and prevented apoptosis and reactive oxygen species (ROS) production in BV-2 microglial cells. These results demonstrated that octacosanol has the ability of [tissue regeneration](#) and potential anti-aging functions ([Lee, Yoo, Lim, & Cho, 2016](#)).