

Research: Wonders of palm oil vitamin E

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Professor Dr Chandan Sen of Ohio State University in the United States tells OOI TEE CHING how the role of palm oil vitamin E tocotrienols in preventing brain cell death after a stroke

MOST people think vitamin E only comes in a single form, but there are actually eight -- four tocopherols and four tocotrienols. The commonly found vitamin E supplements on the shelves of pharmacies are tocopherols.

While tocopherols have been more extensively studied, there is now mounting medical evidence showing tocotrienols have greater benefits when it comes to preventing brain cell death. Using mouse brain cells, scientists at the Ohio State University Medical Center found that tocotrienols -- and not tocopherols -- have the ability to stop an enzyme in the brain from releasing fatty acids that eventually kill nerve cells. In an email interview, Professor Dr Chandan Sen says tocotrienols, the potent variants of vitamin E, are not abundantly present in the American diet.

This is because the margarine and cooking oil, which is largely made up of soy, canola, sunflower and olive oils, only have the tocopherol variants of the vitamin E family. Ten years ago, Dr Sen had already discovered tocotrienols' ability to protect the brain from stroke.

The current study offers more details on how that protection works. "All eight different forms of the natural vitamin E have their distinct functions.

Our research suggests that tocotrienols target specific pathways to protect against neural cell death and rescues the brain, after stroke injury," says Dr Sen, professor and vice chair for research in Ohio State's Department of Surgery and senior author of the study. "Here, we've identified a novel target that explains how neural cells are protected by tocotrienols, the lesser known but far more potent form of vitamin E." Strokes occur when a blood vessel in the brain is blocked or bursts.

When this happens, oxygen supply carried by blood vessels does not reach the brain cells, which then start to die. Symptoms of a brain stroke are sudden.

They include sudden numbness, paralysis or weakness in victim's face, arm, or leg, especially on only one side of the body, sudden vision changes, inability to understand or formulate speech and a sudden, severe headache.

High blood pressure, high cholesterol and diabetes are some key risks that trigger brain strokes. Dr Sen says his team of researchers have studied an enzyme that is activated after a stroke in a way that causes brain cells to die. "We found that it can be put in check by very low levels of tocotrienols.

So, what we have here is a naturally derived nutrient, rather than a drug, that provides this benefit," says the professor, who is also the director of Ohio State's Comprehensive Wound Center. Dr Sen and colleagues had linked tocotrienols' effects to various substances that are activated in the brain after a stroke before they concluded that this enzyme could serve as an important therapeutic target.

The enzyme is called cytosolic calcium dependent phospholipase A2, or cPLA2. Following the trauma of blocked blood flow associated with strokes, an excessive amount of glutamate is released in the brain.

Glutamate is a neurotransmitter that, in tiny amounts, has important roles in learning and memory.

But too much of it triggers a sequence of reactions that lead to brain cell death the most damaging effects of a stroke. Dr Sen and colleagues found that brain cells treated with tocotrienols were 100 per cent more likely to survive than cells exposed to glutamate alone. He also noted that only a small amount of tocotrienol is needed to achieve these effects -- about 250 nanomolar, which is 10 times lower than the average amount of tocotrienol circulating in humans who consume the vitamin regularly. "What this means is, you don't need a lot of palm oil vitamin E to see these effects," he says. "You only need 100mg, twice a day, for 10 weeks to build up an adequate tocotrienol concentration in your system," he adds. This research by Ohio State University appeared in the March 2010 issue of Journal of Neurochemistry.

Supported by the US National Institutes of Health, the study was co-authored by Savita Khanna, Sashwati Roy and Cameron Rink of the Department of Surgery and Narasimham Parinandi and Sainath Kotha of the Department of Internal Medicine, all at Ohio State University; and Douglas Bibus of the University of Minnesota. New Jersey-based Carotech Inc has been the main supplier of Tocomin and Tocomin SupraBio for such studies for almost a decade. "We are proud to have been regularly chosen and associated with medical studies in tocotrienols, a naturally occurring ingredient in palm oil," Carotech Inc vice-president WH Leong says in a separate interview. To date, Carotech is the world's largest and only GMP-certified tocotrienol producer.

"Tocotrienols -- not tocopherols -- taken orally as supplements, are able to penetrate deep into our internal organs like the brain, kidneys and liver.

"It is this characteristic that offers bright promise in clinical trials that seek to save lives from killer diseases such as strokes, heart attacks and cancer," adds Leong.

Carotech Inc's parent company Carotech Bhd is listed on Bursa Malaysia stock exchange.

Apart from supplying palm oil vitamin E for medical research at Ohio State University in the US, Carotech is also facilitating palm oil vitamin E human trials on prevention of strokes and heart attack at Hospital Kepala Batas in Penang. Led by Universiti Sains Malaysia and Malaysian Palm Oil Board's team of scientists, this world's biggest human trial using palm oil vitamin E is filed and viewable at the US Food and Drug Administration website.

This means the findings of this three-year trial ending January 2011, whether positive nor negative, shall be published worldwide.

If the outcome is positive, Carotech will be the world's first to embark on making cholesterol-lowering medicine from palm oil vitamin E.

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