HONOLULU Star-Advertiser

Hawaii News

Compound boosts gene related to longevity, UH researchers find

By Susan Essoyan
Posted March 29, 2017
March 29, 2017

COURTESY UNIVERSITY OF HAWAII

David Watumull, Cardax chief executive officer; Dr. Bradley Willcox, University of Hawaii medical school professor and director of research at the Department of Geriatric Medicine; and Richard Allsopp, associate professor and researcher with the medical school's Institute of Biogenesis Research, discussed Tuesday the findings on an astaxanthin compound's effects on the FOXO3 "longevity gene" in mice.

A gene associated with longevity shifted into high gear in mice fed a diet rich in astaxanthin, a pigment and antioxidant, holding out promise of a possible anti-aging therapy for humans, University of Hawaii medical school researchers announced Tuesday.

The preliminary study, the first of its kind in mammals, examined the impact of an astaxanthin compound on a gene known as FOXO3 which has been shown to contribute to longer, healthier lives in humans.

“We wanted to know, does it activate the gene, does the gene express more proteins?” Dr. Bradley Willcox, professor and director of research at the Department of Geriatric Medicine, said at a news conference. “It turns out there was a pretty powerful effect on the gene.

“So we think that this astaxanthin compound has very promising possibilities for a medicine or a neutraceutical for healthy aging,” he said.

The compound, astaxanthin CDX-085, was provided by Cardax Inc., a life sciences company based in Honolulu. It is not yet on the market, but the company sells a first-generation, less concentrated version known as ZanthoSyn.

Astaxanthin is a carotenoid compound found in many marine organisms including microalgae, salmon and lobster, and gives them their color. In human studies it has been shown to reduce inflammation and improve cholesterol levels.

The UH study revealed a significant effect on mouse heart tissues after just two weeks of dosing the mice, some at a low level and others at the higher dose.

“We found a nearly 90 percent increase in the activation of the FOXO3 ‘longevity gene’ in the mice fed the higher dose of the astaxanthin compound CDX-085,” said Dr. Richard Allsopp, associate professor and researcher with the medical school’s Institute of Biogenesis Research.

The scientists hope to conduct more experiments and compile more data before seeking journal publication of their results, he said.

The researchers would like to examine the impact of astaxanthin on other mice tissues, such as the brain, liver and muscle. They also want to know whether it actually extends the life span of the mice, which normally live about 2-1/2 years, Allsopp said.

Scientists could also assess whether astaxanthin activates the FOXO3 gene in humans. And a clinical trial could gauge whether the supplement improves cognitive function in people with early dementia.

David Watumull, CEO of Cardax, said research can be conducted involving human subjects using ZanthoSyn, the astaxanthin product now on the market, which is created synthetically for purity and consistency and has been deemed safe.

“We’ve been working on astaxanthin products for more than 10 years,” Watumull said. “And to have this kind of research, with astaxanthin and anti-aging, is gratifying for us as a company.”

He added, “We have a compound that actually activates FOXO3, so we’ve connected some dots that didn’t exist before. What we think it means is when FOXO3 is activated, that you have extension of life. … We look forward to further confirmation in human clinical trials of astaxanthin’s role in aging.”

Willcox is principal investigator for the Kuakini Hawaii Lifespan and Healthspan Studies, funded by the National Institutes of Health, that highlighted the role of the FOXO3 gene in longevity. The findings were later replicated in the National Institute on Aging’s Health, Aging and Body Composition Study.

All humans carry the FOXO3 gene, and about 1 out of 3 have the version strongly associated with longevity, Willcox said.

“By activating the FOXO3 gene common in all humans, we can make it act like the ‘longevity’ version,” Willcox said. “Through this research, we have shown that astaxanthin ‘activates’ the FOXO3 gene.”

He and Allsopp decided to experiment with mice after reading about a different study, conducted elsewhere, that involved worms and found they lived 30 percent longer when fed astaxanthin. When the worm’s equivalent of the FOXO3 “longevity gene” was blocked, the life span effect was canceled out.

That suggested that the astaxanthin compound was working through the FOXO3 pathway. So the Honolulu scientists decided to see how the supplement affected the “longevity gene” in mammals.

Vassilis Syrmos, vice president of research at the University of Hawaii, said the study illustrates the power of the private sector and government working together on innovations to diversify the state’s economy.

“We are extremely proud of our collaborative efforts with Cardax on this very promising research that may help mitigate the effects of aging in humans,” Syrmos said in a statement. “This is a great example of what the Hawaii Innovation Initiative is all about.”