

Lipoic acid explored as anti-aging compound

May 17 2007

Researchers said today they have identified the mechanism of action of lipoic acid, a remarkable compound that in animal experiments appears to slow down the process of aging, improve blood flow, enhance immune function and perform many other functions.

The findings, discussed at the "Diet and Optimum Health" conference sponsored by the Linus Pauling Institute at Oregon State University, shed light on how this micronutrient might perform such a wide range of beneficial functions.

"The evidence suggests that lipoic acid is actually a low-level stressor that turns on the basic cellular defenses of the body, including some of those that naturally decline with age," said Tory Hagen, an LPI researcher and associate professor of biochemistry and biophysics at OSU. "In particular, it tends to restore levels of glutathione, a protective antioxidant and detoxification compound, to those of a young animal. It also acts as a strong anti-inflammatory agent, which is relevant to many degenerative diseases."

Researchers at LPI are studying vitamins, dietary approaches and micronutrients that may be implicated in the aging or degenerative disease process, and say that lipoic acid appears to be one of those with the most compelling promise. It's normally found at low levels in green leafy vegetables, but can also be taken as a supplement.

According to Hagen, research on the natural processes of aging, and steps that could slow it or improve health until near the end of life, are of

growing importance.

"We're coming into the middle of an aging epidemic in the country," he said. "In a short time more than 70 million Americans will be over 65. This is partly because of the Baby Boom, but also people are living longer, being saved with antibiotics and other medical treatments. In any case, it will be an unprecedented number of elderly people in this nation."

The goal of LPI research, Hagen said, is to address issues of "healthspan," not just lifespan – meaning the ability to live a long life with comparatively good health and vigor, free of degenerative disease, until very near death. The best mechanisms to accomplish that, scientists say, have everything to do with diet, exercise, healthy lifestyle habits and micronutrient intake.

At the moment, Hagen said, that's not the way things appear to be headed – diabetes is skyrocketing, about 50 percent of people over 65 have high blood pressure, heart disease often leads to permanent disability, and almost half of the elderly people in America have malnutrition that is easily preventable.

No single intervention can address all of these issues, Hagen said, but one that scientists keep coming back to is lipoic acid.

"Our studies have shown that mice supplemented with lipoic acid have a cognitive ability, behavior, and genetic expression of almost 100 detoxification and antioxidant genes that are comparable to that of young animals," Hagen said. "They aren't just living longer, they are living better – and that's the goal we're after."

What the OSU researchers now believe is that the role of lipoic acid is not so much a direct one to benefit cells, but rather an indirect aid that

"kick starts" declining function in cells and helps them recover the functions that came more easily and naturally in young animals.

In various effects, lipoic acid appears to help restore a cellular "signaling" process that tends to break down in older blood vessels. It reduces mitochondrial decay in cells, which is closely linked to the symptoms of aging. With age, glutathione levels naturally decline, making older animals more susceptible to both free radicals and other environmental toxins – but lipoic acid can restore glutathione function to near normal. And the expression and function of other genes seems to come back to life.

"We never really expected such a surprising range of benefits from one compound," Hagen said. "This is really unprecedented, and we're pretty excited about it."

Many other presentations have been made at this conference on the role of diet, lifestyle and micronutrients in health and degenerative disease, including cancer, heart disease, neurological diseases and aging.

The conference is organized every two years by OSU's Linus Pauling Institute, and attracts leading experts from around the world in these research fields.

Source: Oregon State University

Citation: Lipoic acid explored as anti-aging compound (2007, May 17) retrieved 3 May 2024 from <https://medicalxpress.com/news/2007-05-lipoic-acid-explored-anti-aging-compound.html>

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