

Is taurine the 'elixir of life'? Maybe, if you're a worm, mouse or monkey

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University in New York City, in a news briefing.

“This study suggests that taurine could be an elixir of life within us,” Yadav said in an earlier news release on the study, which published Thursday in the journal Science.

Ready for ‘prime time’?

Considered a non-essential amino acid, taurine exists in the brain, retina and nearly every muscle and organ tissue in the body. Studies have found it may be anti-inflammatory and neuroprotective in older brains but potentially harmful to the developing brains of adolescents. Taurine deficiencies are linked to heart, kidney and retinal damage.



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Absorbed from foods such as shellfish and meat and distributed by the liver, taurine levels decline with age, “but if you top it up back to youthful levels, then you have this effect that the mice live healthier for longer,” coauthor Henning Wackerhage, a professor of exercise biology at the Technical University of Munich in Germany, said in the briefing.

Tests in monkeys found those who took taurine supplements were leaner, had better blood sugar levels and less liver damage, had increased bone density, a younger-looking immune system and gained less weight, according to the study.

“These studies in several species show that taurine abundance declines with age and the reversal of this decline makes the animals live longer and healthier lives,” Yadav said. “At the end of the day, the findings should be relevant to humans.”

~~But worms, mice and monkeys are not people, and science is years away from proving~~

mortality and mortality from most major diseases," White said in an email. "Some additional studies in humans using taurine supplements would be interesting, but we are long way from suggesting their use."

The only experiment on humans in the study found exercise — often called the key to longevity — improved taurine levels in people. However, exercise also reduces cholesterol; improves blood flow; lowers blood pressure; strengthens muscles, including the heart, boosts energy; improves sleep; and fights chronic disease.



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"I really dislike claims of extreme longevity extension in humans because we simply just don't know," said Gordon Lithgow, professor and vice president of academic affairs at the Buck Institute in Novato, California, an independent biomedical research institute focused solely on aging.

"I'm not saying it's not possible, but we need to have proper double-blinded clinical trials in people to see what happens," said Lithgow, whose lab conducted the research on worms included in the new study.

Unfortunately, many drugs, supplements, herbs and vitamins which appear to be beneficial may fail spectacularly once science has finished its examination, he said.

"Take vitamin E for example. People have been taking vitamin E for decades, and then we find out it certainly doesn't do any good and may actually be harmful," Lithgow said. "You have to wait for the clinical trial data — that's the only real measure in biomedicine."

Despite these caveats, "it's hard not to get excited about this study," Lithgow said.

"You've got something like 400 million years of separation between worms and people, and yet you see beneficial effects with the same restoration of this natural metabolite



Taurine-fed worms lived longer and appeared healthier, but taurine “had no effect on yeast,” Yadav said. Taurine-supplemented mice, however, “were leaner, had an increased energy expenditure, increased bone density, improved muscle strength, reduced depressive and anxious behaviors, improved memory, reduced insulin resistance and a younger looking immune system.”

Just how is taurine accomplishing this? That answer isn't yet clear, Wackerhage said, “but is my subjective opinion that taurine somehow seems to hit the engine room of aging.”

On a metabolic level, Yadav said, taurine seems to improve the health of mitochondria, the body's cellular powerhouse which creates “90% of the energy you need to sustain life and support organ function,” according to the [United Mitochondrial Disease Foundation](#).

Analysis of tissues in taurine-supplemented mice also showed the amino acid suppresses so-called “zombie” or senescent cells — older, damaged cells that refuse to die and begin excreting inflammatory factors that trigger diseases like Alzheimer's and hasten aging.

Taurine also increased stem cells present in some tissues, reduced DNA damage and improved a cell's ability to sense nutrients, the study found.

“Taurine is hitting the aging brake. It is not putting the vehicle in the reverse gear,” Yadav said. “It is slowing down the aging process, and that is why animals are living longer and healthier.”

Wait for the proof

Early results about other potential anti-aging compounds — such as the diabetes drug

factors will depend on the age of the population studied.

In addition, Yadav added, users need to be sure any taurine supplement purchased off a market shelf are “not adulterated.”

That’s a major issue because supplements are not regulated by the US Food and Drug Administration, said Dr. Pieter Cohen, an associate professor of medicine who runs the Supplement Research Center at the Cambridge Health Alliance in Somerville, Massachusetts.

Many supplements contain less or more of whatever is listed on the label, while some can contain unknown additives. A recent study by Cohen on melatonin gummies, for example, found one contained 347% the amount of melatonin listed on the label, while another contained only cannabidiol, or CBD, not mentioned on the label.

“Getting excited about a drug is fine, as it must go through a rigorous FDA approval process before you can access it,” Cohen said. “But supplements aren’t regulated, so you can really mislead the public. They read about the study and may go online and purchase taurine and be ingesting it within days.”

Then there’s the danger that people, including teenagers, will turn to energy and sports drinks packed with unhealthy sugars and caffeine along with taurine. Researchers have found between 750 and 1,000 milligrams per serving of taurine in energy and sports drinks —the normal diet typically contains 40 to 400 milligrams per day.

High levels of taurine, especially in combination with caffeine in energy and sports drinks, may be toxic to the developing adolescent brain and body, according to a 2017 review.

“Cardiac effects are exacerbated when taurine and caffeine are ingested together which can be a concern, given that caffeine alone can increase blood pressure and heart rate,” the review noted.



“Although the aged or diseased brain might benefit from

seem to have a lower risk of other diseases like cardiovascular disease and neurodegenerative disease,” Lithgow said.

In the end, science is going to need “100 different kinds of taurine,” Lithgow said. “Aging is highly complex, with lots of biochemical processes and tissues interacting with each other. There’s not going to be one solution to slowing aging.

“It’s likely we’re going to need a combination of things we have in our bodies already, along with some drug development and well known solutions like exercise and nutrition.”

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