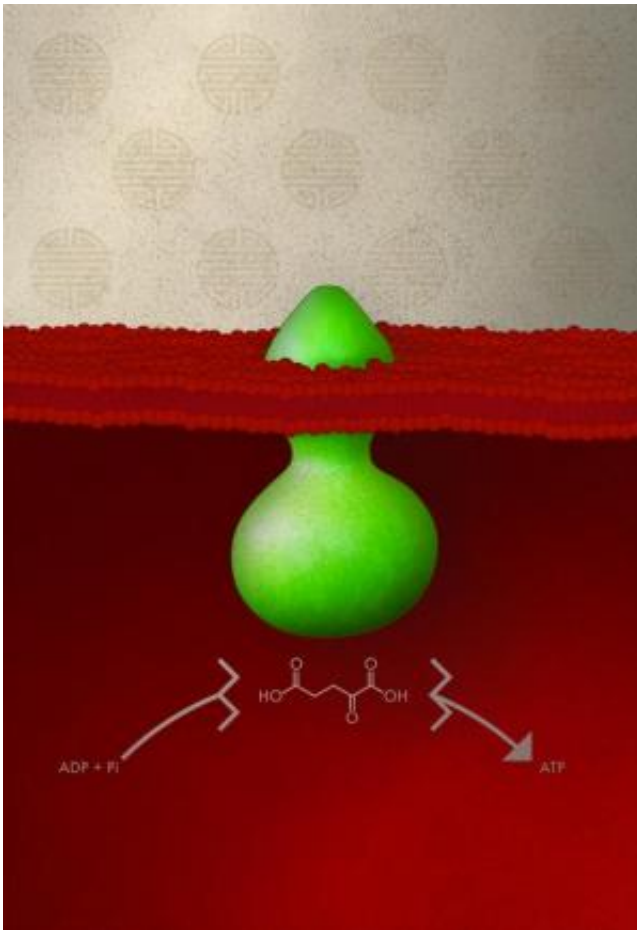


Researchers find alpha-ketoglutarate more than doubles lifespan of nematode

May 15 2014, by Bob Yirka



The gourd, a symbol of longevity, is said to hold the elixir of immortality in Chinese mythology. Shaped like a gourd, the ATP synthase is the main energy-generating machinery in the cell and the target of the longevity metabolite a-KG. Credit: Aaron Kovalcsik

(Medical Xpress)—A team of researchers working at the University of California has found that adding the compound α -ketoglutarate (alpha-KG) to a nematode diet can drastically extend its lifespan. In their paper published in the journal *Nature*, the team describes how during testing of several metabolites they found that alpha-KG was the only one that had an impact on longevity in nematodes.

Alpha-KG is currently found in some dietary supplements, along with claims that it will increase the lifespan and boost [muscle development](#). Neither claim has been verified by an independent source, but in this new effort, it does appear that it is able to extend the life of the common nematode. The compound appears to pull off this feat by simulating an extremely low caloric diet.

Alpha-KG is a part of a metabolic pathway—in practice it's one part of the mechanism that is involved in energy transfer in cells. The researchers found that the compound inhibits the creation of ATP synthase, one of the main producers of ATP—a chemical responsible for energy transfer—it resides in the mitochondria. They also found that Alpha-KG inhibited the production of TOR, a protein responsible for monitoring nutrient supplies. Prior research has shown that restricting caloric intake causes virtually the same changes, which makes sense, as other studies have shown that drastically reducing [caloric intake](#) causes an increase in lifespan by lowering the metabolism rate.

Feeding nematodes Alpha-KG, the researchers found, could increase the [lifespan](#) of a nematode by up to 80 percent, and it also extended vitality. Instead of becoming lethargic, the nematodes exhibited youthful behavior far longer than normal. They are also quick to point out that their results have no bearing on human beings. In fact, they have no bearing on any other animal, though the team says they suspect that giving the compound to mice will cause them to live longer—just as occurs when they are put on restrictive diets. As an interesting aside, the

researchers note that because Alpha-KG does its magic by slowing metabolism, it would seem logical to suggest that in mammals, there would be muscle loss, rather than growth, refuting at least one claim by nutritional supplement makers.

More information: Paper: The metabolite a-ketoglutarate extends lifespan by inhibiting ATP synthase and TOR, *Nature*, [dx.doi.org/10.1038/nature13264](https://doi.org/10.1038/nature13264)

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