

# Longevity breakthrough: The metabolic state of mitochondria controls life span

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If you think life's too short, then you're not alone. A team of scientists from Texas set out to find what it would take to live a very long life and they made important discoveries that bring longer life spans much closer to reality. A new research report featured on the cover of The *FASEB Journal*, describes how scientists "activated" life extension in the worm, *C. elegans*, and in the process discovered a new metabolic state correlating with long life.

"*C. elegans* has provided a useful [animal model](#) for human biology," said Gerald Weissmann, M.D., Editor-in-Chief of The *FASEB Journal*, "because of their relative simplicity and our understanding of the [genes](#) that control their [metabolism](#). Helping these worms to live longer is a proof of concept; indeed much of what we now know about human aging was first worked out in these worms."

To make this discovery, scientists compared one class of long-lived *C. elegans*, called the Mit mutants, with non-mutant wild type *C. elegans*. Their comparison showed significant metabolism changes, suggesting that their cellular engines had been reconfigured to run on new fuels and to make new waste products, leading to increased lifespans.

To determine the cause of these metabolism changes, scientists created a new method for collecting cellular waste and studied it to identify the specific [chemical reactions](#). They found that that the worms achieved long life through changes in how their cells extracted energy (metabolic state). Although *C. elegans* often is used as an animal model for human

biology, more research is needed to determine if an equivalent metabolic state could be created in humans with the same results.

"This research on worms shows that the secret to a long life comes from how we extract energy from our food," said Gerald Weissmann, M.D., Editor-in-Chief of The [FASEB Journal](#). "With any luck, we'll be able to change human life in the same direction: onward and upward!"

**More information:** Jeffrey A. Butler, Natascia Ventura, Thomas E. Johnson, and Shane L. Rea. Long-lived mitochondrial (Mit) mutants of *Caenorhabditis elegans* utilize a novel metabolism. *FASEB J.* December 2010 24:4977-4988; [doi:10.1096/fj.10-162941](https://doi.org/10.1096/fj.10-162941)

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