Live fast, die young? Maybe not

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The theory that a higher metabolism means a shorter lifespan may have reached the end of its own life, thanks to a study published in the journal Physiological and Biochemical Zoology. The study, led by Lobke Vaanholt (University of Groningen, The Netherlands), found that mice with increased metabolism live just as long as those with slower metabolic rates.

The theory that fast-living animals die young, known as the rate-of-living theory, was first proposed in the 1920s. The premise is simple: Aging is the inevitable byproduct of energy expenditure. The faster you expend energy, the faster you age, and the sooner you die. It remained a prominent theory of aging until recently, when comparisons across broad animal groups cast doubt on it. For instance, birds have significantly higher metabolisms than mammals of similar size, yet the birds live much longer.

Vaanholt's study was designed to test the rate-of-living theory among individuals of one species—in this case, mice.

For their experiment, Vaanholt and her team followed two groups of mice through their entire lives. One group's environment was kept at 71 degrees Fahrenheit (22 degrees Celsius), and the other group's at 50 degrees Fahrenheit (10 degrees Celsius). The colder group had to expend more energy to maintain body temperature, and according to the rate-of-living theory, should therefore die sooner than the warm group.

But that's not what happened.

"Despite a 48 percent increase in overall daily energy expenditure and a 64 percent increase in mass-specific energy expenditure throughout adult life, mice in the cold lived just as long on average as mice in warm temperatures," the authors write. "These results strengthen existing doubts about the rate-or-living theory."

The finding is consistent with an experiment Vaanholt conducted previously. That experiment manipulated metabolism in mice through exercise rather than temperature. Mice that expended more energy over a lifetime through exercise had the same lifespan as those that did not exercise.

Both studies cast significant doubt on a theory that just may have burned itself out.

Source: University of Chicago