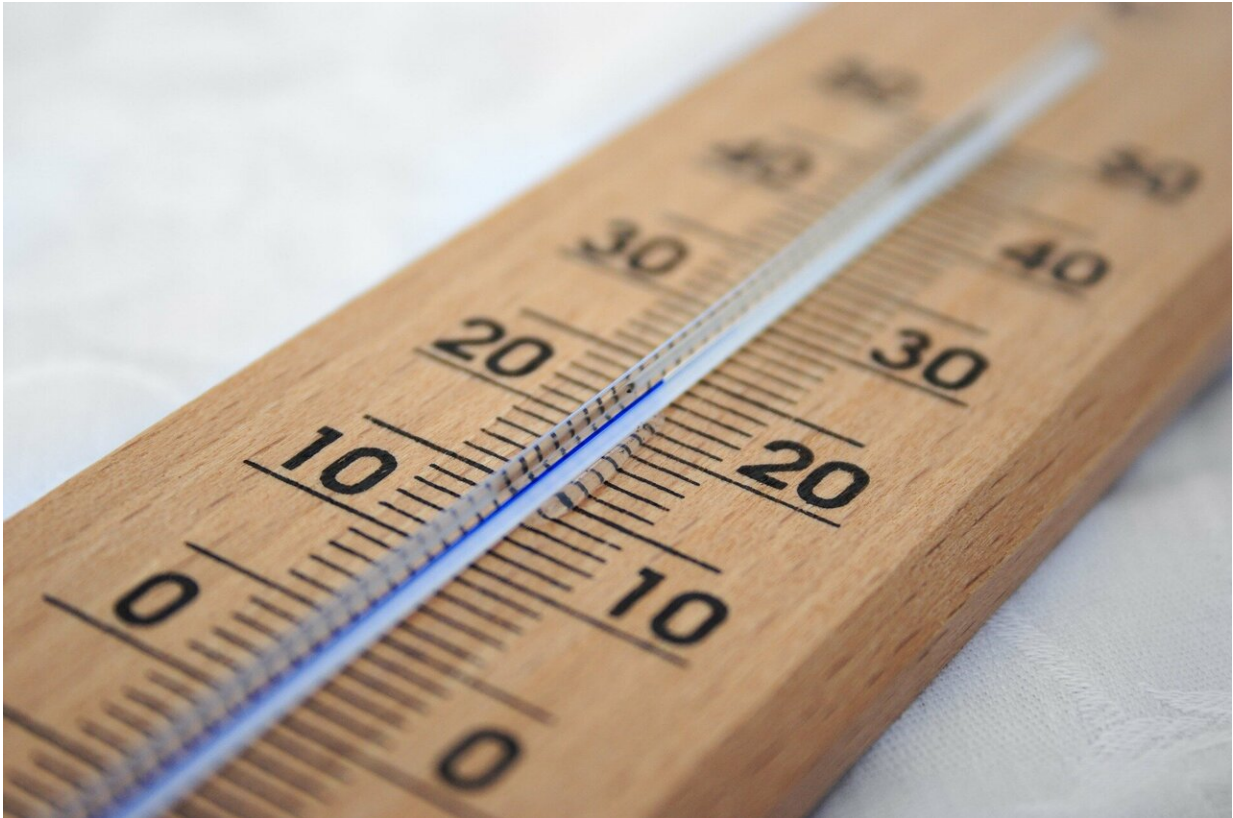


Live fast, die young? Or live cold, die old?

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Researchers from the Shenzhen Institute of Advanced Technology (SIAT) of the Chinese Academy of Sciences, along with collaborators from Wenzhou University and the University of Aberdeen, have found that body temperature exerts a greater effect on lifespan than metabolic rate.

Their findings were published in *Nature Metabolism* on March 14.

You have probably heard the phrase "live fast, die young." It comes from the observation that people with fast and risky lifestyles often get into accidents and die prematurely. But in biology it has a rather different origin. It comes from the observation that animals with high metabolic rates ("living fast") tend to die sooner than those with [slow metabolism](#).

However, within a particular species, the link between metabolism and lifespan is less clear. Generally, interventions that produce extended life—like caloric restriction leading to lower metabolic rates—are consistent with the "live fast, die young" idea. Nevertheless, exercise increases metabolism, but on average it seems to make people live a little longer.

One problem with working out the effect of metabolism on lifespan is that metabolism is often linked to changes in body [temperature](#). Generally, low metabolic rates are associated with low body temperature. So, when mice under [caloric restriction](#) live longer, it's not clear that the extended lifespan is linked to their low metabolism or lower body temperature.

In this study, the researchers utilized an unusual situation where metabolic rate and body temperature move in [opposite directions](#) to try to determine which factor is more important.

When mice and hamsters are exposed to high temperatures, at the top of their thermoneutral zone, their metabolism falls while their body temperature goes up. "We found that exposing the rodents to these conditions shortened their lifespans. Lower metabolism didn't lengthen their lives, but higher temperatures shortened it," said Prof. John R. Speakman from SIAT, a co-corresponding author of the study.

In this study, the researchers used small fans to blow air over the mice and hamsters exposed to high temperatures. This didn't affect their [metabolism](#), but it prevented them from having high body temperatures. This situation reversed the impact of high ambient temperature on their lifespan.

Based on these results, body temperature seems to be a much more important mediator of lifespan than metabolic rate. For this reason, maybe we should change the saying from "live fast, die young" to "live cold, die old."

"We separated the effect of body temperature on lifespan from metabolic rate in two species of small rodents exposed to high temperatures. We are excited about the findings, particularly that using small fans to blow air over the animals reversed the effect of high ambient temperature on [lifespan](#) by decreasing body temperature without changing [metabolic rate](#)," said Zhao Zhijun from Wenzhou University, who was the first and co-corresponding author of this study.

More information: Zhijun Zhao, Body temperature is a more important modulator of lifespan than metabolic rate in two small mammals, *Nature Metabolism* (2022). [DOI: 10.1038/s42255-022-00545-5](#).
www.nature.com/articles/s42255-022-00545-5

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