Do lazy mammals live longer?

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Experiments with Djugarian hamsters native to Siberia showed that when the tiny rodents temporarily lower their metabolism and body temperatures, a state called torpor, it stops and even reverses a natural breakdown of chromosomes linked to ageing.

Previous studies had hinted at a causal link between hibernation and longevity, but this is the first one to show the biological mechanism that

may account for it.

In the laboratory, researchers led by Christopher Turbill of the Institute for Wildlife Ecology in Vienna created an artificial environment for 25 adult virgin female hamsters, offering only eight hours of light per day.

The faux-winter conditions were designed to trigger a hibernation response, according to the study, published Wednesday by the British Royal Society in the journal *Biology Letters*.

For 180 days, half the rodents basked in a relatively balmy 20 degrees Celsius (68 degrees Fahrenheit), while the others half lived in a chillier clime, about 9.0 C (48 F). Both groups enjoyed all-you-can-eat buffet.

In measuring the results, the researchers distinguished between shallow torpor, when body temperature dipped below 29 C (84 F), and deep torpor, when temperature dropped under 25 C (77 C), nearly 10 C (18 F) below normal.

They inserted micro-transponders under the animals' skin to keep track of the changes.

Turbill and colleagues suspected that the energy-saving, coma-like state had an impact on telomeres, which sit like tiny caps on the ends of chromosomes, protecting the precious strands of genetic code.

Telomeres and telomerase, the enzyme that control them, are a key agent in ageing and longevity.

Every time a cell divides, the telomeres get worn down a little bit. The enzyme's job is to partially rebuild them. Eventually, when the telomeres are worn beyond repair, cell death is triggered.

Australian-American cell biologist Elizabeth Blackburn, who shared the 2009 Nobel Prize in Medicine for her work in the field, likened telomeres to the "tips of shoelaces" -- lose the little plastic end, and the lace starts to fray.

For the hamsters, daily torpor, which typically lasted several hours, somehow acted to preserve these protective tips and even to restore them, the study found.

"This effect was stronger in hamsters using deep torpor, which was primarily in the cold," Turbill said in an email exchange.

Interestingly, these same hamsters also expended more energy, reflected in their higher food intake.

The findings, he added, "are probably applicable to all animals that use some form or torpor or hibernation."

That, alas, does not include humans.

"Torpor and sleep are completely different -- and possibly incompatible -- states," Turbill said. Humans do not significantly lower their body temperature when sleeping, nor is there a comparable slowdown in metabolic rate.

"So far, science has not come close to finding a way for humans to enter some form of hibernation."