

# Scientists find path to fountain of youth



by Jean-Louis Santini – Thu Oct 1, 11:10 pm ET



*AFP/National Institute of Health/File – The fountain of youth may exist after all, as a study showed that scientists have discovered means to ...*

WASHINGTON (AFP) – The fountain of youth may exist after all, as a study showed that scientists have discovered means to extend the lifespan of mice and primates.

The key to eternal -- or at least prolonged -- youth lies in genetic manipulation that mimics the health benefits of reducing calorie intake, suggesting that aging and age-related diseases can be treated.

Scientists from the Institute of Healthy Ageing at University College London (UCL) extended the lifespan of mice by up to a fifth and reduced the number of age-related diseases affecting the animals after they genetically manipulated them to block production of the S6 Kinase 1 (S6K1) protein.

Scientists have shown since the 1930s that reducing the calorie intake by 30 percent for rats, mice and -- in a more recent finding -- primates can extend their lifespan by 40 percent and have health benefits.

By blocking S6K1, which is involved in the body's response to changes in food intake, similar benefits were obtained without reducing food intake, according to the study published in the US journal *Science*.

The results corroborated those of other recent studies.

"Blocking the action of the S6K1 protein helps prevent a number of age-related conditions in female mice," explained UCL professor Dominic Withers, the study's lead author.

"The mice lived longer and were leaner, more active and generally healthier than the control group. We added 'life to their years' as well as 'years to their lives.'"

The genetically altered female mice lived 20 percent longer -- living a total of 950 days -- or over 160 days more than their normal counterparts.

At age 600 days, the equivalent of middle age in humans, the altered female mice were leaner, had stronger bones, were protected from type 2 diabetes, performed better at motor tasks and demonstrated better senses and cognition, according to the study.

Their T-cells, a key component of the immune system also seemed more "youthful," the researchers said, which points to a slowing of the declining immunity that usually accompanies aging.

Male mice showed little difference in lifespan although they also demonstrated some of the health benefits, including less resistance to insulin and healthier T-cells. Researchers said reasons for the differences between the two sexes were unclear.

"We are suddenly much closer to treatments for aging than we thought," said David Gems of UCL's Institute of Healthy Aging, one of the authors of the study, which was primarily funded by the Wellcome Trust.

"We have moved from initial findings in worm models to having 'druggable' targets in mice. The next logical step is to see if drugs like metformin can slow the aging process in humans."

Other studies have also found that blocking S6K1 were channeled through increased activity of a second molecule, AMPK, which regulates energy levels within cells.

AMPK, also known as a master "fuel gauge," is activated when cellular energy levels fall, as takes place when calorie intake is reduced.

Drugs, such as the widely-used metformin, that activate AMPK are already being used in human patients to treat type 2 diabetes.

Recent studies by Russian scientists suggested that metformin can extend mice's lifespan.

Another drug, rapamycin, was found to extend the lifespan of mice, according to a study published in the British journal Nature.

As rapamycin is already used in humans as an immunosuppressant -- to prevent a patient from rejecting an organ after transplant -- it could not be administered as an anti-ageing drug in its current form.

But rapamycin blocks S6K1 activity and could thus extend lifespan through its impact on S6K1.

Seizing on the potential, US firm Sirtris Pharmaceuticals uses resveratrol, a powerful anti-oxidant found in red wine, as well as other fruits than raisin.

Sirtris scientists -- including co-founder David Sinclair, also a researcher at Harvard Medical School -- have found that resveratrol activates the production of sirtuin proteins, which also unleash the same physiological effects as reducing calorie intake.

Sirtris has produced highly concentrated doses of resveratrol and is currently leading clinical trials with diabetes patients and others suffering from liver and colon cancer.