



# fountain of youth: progress in slowing ageing, at least in mice

The Idea of Progress

Myths and Heroes

Did you see the Super Bowl commercial showing those old codgers acting like teenagers? It's enough to make you turn against the whole idea of extending the human lifespan.

5 However, scientists the world over are busy in their labs trying to figure out just where Ponce de Leon left his elusive fountain of youth. They may never find it, but new research suggests that even if we can't live a few hundred years, we may at least be able to reverse some of the degenerative effects of what scientists call the "normal ageing process."

Scientists at two of the world's leading research institutions, Harvard and the University of California, Berkeley, achieved what Berkeley is calling a "major advance," if not a breakthrough, in the search for a way to stem the ravages of time.

They were able to make old mice seem young again, or at least pick up where nature left off and regenerate the production of blood cells.

20 They did it by injecting a longevity gene that reversed the decline that had been brought on by ageing. That's no fountain of youth, but it could be a really big thing.

If scientists can figure out how to slow ageing, or even repair its damages, it may be possible to curb some very debilitating diseases ranging from cancer to dementia.

25 "Our study is really the first one demonstrating that sirtuins (proteins known to regulate ageing) can reverse ageing-associated degeneration, and I think that's very exciting," Danica Chen, a Berkeley assistant professor of nutritional science and toxicology and coauthor of a study published in Cell Reports, said in releasing the paper. "This opens the door to potential treatments for age-related degenerative diseases."

35 One of the most important signs of ageing, in all animals, is the gradual loss of the ability to maintain tissues and, especially, blood cells. In time, the body just loses its ability to generate new blood cells to replace those that have fallen along the way.

But as organisms age, the adult stem cells that are supposed to maintain and repair tissue decline in number.

40 The researchers found that when they injected the longevity gene into ageing mice, they stepped up the production of new adult stem cells, thus fending off the decline that would have been expected from normal

ageing. But it's even more than that. It actually repaired a system that had deteriorated because of ageing. 45

This particular protein has been demonstrated to suppress tumors, so the possibilities are tantalising. Could it be that simply injecting this longevity gene into a senior could someday be enough to fight cancer and rehabilitate the blood supply? It's too soon to know that, but the study ends with a positive note, suggesting that this protein – SIRT3 – may play a huge role in the years ahead. 50

"We speculate that SIRT3 may regulate stem cells in other tissues," the report says. "Given that adult stem cells are thought to be central to tissue maintenance and organismal survival, SIRT3 may promote organismal longevity by maintaining the integrity of tissue-specific stem cells." 55

But the scientists caution that "future studies" will have to decide that. So is it the fountain of youth? It may be at least the first sip. 60

However, it should be noted that there is a great deal of skepticism among experts over whether human longevity can be increased significantly. Ageing is a very complex process, and it is not well understood. Thus, any discussion of the matter usually shifts quickly 65

away from longevity. Even if we can't extend our lifespans, it should be possible to maintain the quality of life for much longer, and on that issue there is much more optimism. This kind of research may be part of the solution.

Lee Dye, ABC News, February 6<sup>th</sup> 2013



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