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News

# Telomerase reverses ageing process

**Dramatic rejuvenation of prematurely aged mice hints at potential therapy.**

Ewen Callaway

Premature ageing can be reversed by reactivating an enzyme that protects the tips of chromosomes, a study in mice suggests.

Mice engineered to lack the enzyme, called telomerase, become prematurely decrepit. But they bounced back to health when the enzyme was replaced. The finding, published online today in *Nature*<sup>1</sup>, hints that some disorders characterized by early ageing could be treated by boosting telomerase activity.

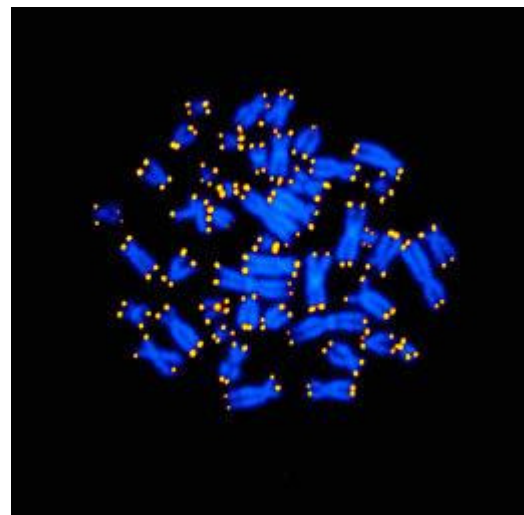
It also offers the possibility that normal human ageing could be slowed by reawakening the enzyme in cells where it has stopped working, says Ronald DePinho, a cancer geneticist at the Dana-Farber Cancer Institute and Harvard Medical School in Boston, Massachusetts, who led the new study. "This has implications for thinking about telomerase as a serious anti-ageing intervention."

Other scientists, however, point out that mice lacking telomerase are a poor stand-in for the normal ageing process. Moreover, ramping up telomerase in humans could potentially encourage the growth of tumours.

## Eternal youth

After its discovery in the 1980s, telomerase gained a reputation as a fountain of youth. Chromosomes have caps of repetitive DNA called telomeres at their ends. Every time cells divide, their telomeres shorten, which eventually prompts them to stop dividing and die. Telomerase prevents this decline in some kinds of cells, including stem cells, by lengthening telomeres, and the hope was that activating the enzyme could slow cellular ageing.

Two decades on, researchers are realizing that telomerase's role in ageing is far more nuanced than first thought. Some studies have uncovered an association between short telomeres and early death, whereas others have failed to back up this link. People with rare diseases characterized by shortened telomeres or telomerase mutations seem to age prematurely, although some tissues are more affected than others.



Protecting chromosome tips doesn't just prevent ageing. It can reverse it.

*Peter Lansdorp/Visuals Unlimited/Corbis*

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