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The First Documented Age Reversal in a Mammal: Harvard University Study shows Telomerase Activation Helps Reverse the Aging Process

Jaskelioff M., Muller F.L., Paik J.H., Thomas E., Jiang S., Adams A.C., Sahin E., Kost-Alimova M., Protopopov A., Cadiñanos J., Horner J.W., Maratos-Flier E., Depinho R.A. Telomerase reactivation reverses tissue degeneration in aged telomerase-deficient mice. *Nature*. 2011;469(7328):102-106.

According to a study published in the January 2011 issue of *Nature* journal, premature aging can be reversed by reactivating telomerase, the enzyme that lengthens telomeres.

The study, led by scientist Ronald DePinho, of the Dana-Farber Cancer Institute and Harvard Medical School in Boston, Massachusetts, offers the possibility that normal human aging could be slowed by activating the telomerase enzyme in cells where it has stopped working.

Researchers studied mice that were artificially aged by switching off the telomerase enzyme. The mice experienced:

- Weakened organs
- Infertility
- Grey hair
- Dermatitis
- Other age-related conditions
- Early death.

However, when the telomerase enzyme was switched back on, the mice became younger.

Researchers saw a dramatic reversal in the signs and symptoms of aging with telomerase activation.

Benefits included:

- Increased brain size
- Improved cognition
- Restoration of hair to a healthy sheen
- Restored fertility
- Recuperation of organs (spleen, liver, intestines)

The most important lesson learned from this study is that aged tissues, even ones in an advanced state of degeneration, retain a remarkable capacity to renew themselves and telomerase, when activated, can reverse certain aspects associated with aging.

“If you look at all those data together, you walk away with the idea that the loss of telomerase could be a very important instigator of the aging process,” according to Dr. DePinho.