



# Young forever? Key to reverse aging unlocked

## New Test Makes 2-Yr-Old Mice Appear 6 Months Old

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**London:** Researchers have found a cause of aging in animals that can be reversed, possibly paving the way for new treatments for age-related diseases including cancer, muscle wasting and inflammatory diseases. The researchers hope to start human trials late next year.

The study, which is published in the journal *Cell*, relates to mitochondria, which are our cells' battery packs and give energy to carry out key biological functions.

Researchers from Harvard Medical School and the University of NSW have discovered a way of restoring the efficiency of cells, completely reversing the aging process in muscles. Researchers injected a chemical called nicotinamide adenine dinucleotide or NAD, which reduces in the body as we age.

The work, led by UNSW Medicine's David Sinclair, found a series of molecular events enable communication inside cells between the mitochondria and the nucleus. As communication breaks down, aging accelerates.

"The aging process we discovered is like a married couple — when they are young, they communicate well, but over time, living in close quarters for many years, communication breaks down," says UNSW professor Sinclair, who is based at Harvard Medical School.



### YOU CAN TURN BACK THE CLOCK

"And just like a couple, restoring communication solved the problem," says the geneticist.

The background to the research is that as we age, levels of the chemical NAD, which starts this communication cascade, decline. Until now, the only way to slow the NAD drop was to restrict calories and exercise intensively. In this work, the researchers used a compound that cells transform into NAD to repair the broken network and rapidly restore communication and mitochondrial function. It mimics the effects of diet and exercise. While professor Sinclair's group in Boston was working on muscles in tissue

culture, colleagues at UNSW in Sydney were working on animal models to prove the work could have the same results. "It was shocking how quickly it happened," says co-author Dr Nigel Turner, from UNSW's department of pharmacology.

"If the compound is administered early enough in the aging process, in just a week, the muscles of the older mice were indistinguishable from the younger animals". The mice, which were two-years-old, also performed well on insulin resistance and inflammation — both of which are correlated with aging. They were compared with six-month-old animals.