

Bone drug protects stem cells from ageing

December 17 2015

Stem cells can be protected from the effects of ageing by a drug currently used to treat patients with osteoporosis, a breakthrough study has found.

Scientists from the University of Sheffield discovered the [drug](#) zoledronate is able to extend the lifespan of [mesenchymal stem cells](#) by reducing DNA damage.

DNA damage is one of the most important mechanisms of ageing where stem cells lose their ability to maintain and repair the tissues in which they live and keep it working correctly.

The pioneering research shows the drug protects the stem cells from DNA damage enhancing their survival and maintaining their function.

Professor Ilaria Bellantuono, from the University's Department of Metabolism, said: "The drug enhances the repair of the damage in DNA occurring with age in stem cells in the bone. It is also likely to work in other stem cells too.

"This drug has been shown to delay mortality in patients affected by osteoporosis but until now we didn't know why. These findings provide an explanation as to why it may help people to live longer.

"Now we want to understand whether the drug can be used to delay or revert the ageing in stem cells in [older people](#) and improve the maintenance of tissues such as the heart, the muscle and [immune cells](#),

keeping them healthier for longer.

"We want to understand whether it improves the ability of [stem cells](#) to repair those tissues after injury, such as when older patients with cancer undergo radiotherapy."

Approximately 50 per cent of over 75 year-olds have three or more diseases at the same time such as cardiovascular disease, infections, muscle weakness and osteoporosis. In the future it is hoped this drug could be used to treat, prevent or delay the onset of such diseases rather than using a mixture of drugs.

Dr Bellantuono added: "We are hopeful that this research will pave the way for a better cure for cancer patients and keeping older people healthier for longer by reducing the risk of developing multiple age-related diseases."

More information: Zoledronate Attenuates Accumulation of DNA Damage in Mesenchymal Stem Cells and Protects their Function *Stem Cells* DOI: 10.1002/stem.2255

Provided by University of Sheffield

Citation: Bone drug protects stem cells from ageing (2015, December 17) retrieved 10 April 2024 from <https://medicalxpress.com/news/2015-12-bone-drug-stem-cells-ageing.html>

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