

New research shows sensitivity to oxidative stress is not always linked to aging

May 11 2016



Scientists make an important breakthrough in understanding the impact of oxygen exposure on the aging process of mammal cells. Credit: Getty Images

A study published in the US journal, *Aging* by the University of Surrey and University of Rochester has made an important breakthrough in understanding the impact of oxygen exposure on the aging process of mammal cells. The findings of the research could pave the way for better understanding of the ageing process in humans and new treatments against ageing-associated diseases.

Scientists had previously believed that oxidative stress was implicated in the cause of many diseases, and had an impact on the body's ageing process. However, in this study, the team discovered that sensitivity to oxidative stress is not necessarily associated with longevity.

To investigate whether there was any correlation between the biological [ageing process](#) and sensitivity to [atmospheric oxygen](#), the team compared the growth rate of lung and [skin cells](#) from connective tissues of 16 [rodent species](#) whose maximum lifespan ranged from 4 to 32 years.

Cells from rodents such as mice and capybaras were kept in culture using two different concentrations of oxygen - either at 3% or at 21% - and their growth rate was compared using state-of-the-art cell culturing methods. Cells (fibroblasts) from connective tissues from lung and skin were used in the experiment as they play a critical role in wound healing.

Laboratory mice were the only species that demonstrated extreme sensitivity to oxygen. Interestingly, cells from wild caught mice, naked mole rat, hamster, muskrat, woodchuck, capybara, paca, squirrel and beaver were mildly sensitive to oxygen whereas cells from rat, gerbil, guinea pig, deer mouse and chinchilla were not affected by oxygen concentration.

The data from the study is a major discovery and suggest that sensitivity to [oxidative stress](#) is not always associated with longevity. The team found those species in the oxygen non-sensitive group, including rat, gerbil, guinea pig and chinchilla tended to have a shorter lifespan. On the contrary, cells from the species that tend to live longer, including capybaras, pacas, naked mole rat and beaver, were more sensitive to oxygen.

Co-author, Dr Augusto Coppi from the School of Veterinary Medicine

at the University of Surrey, said: "Our findings open up many areas to explore in the field of ageing and regenerative medicine. With these new insights it would be very interesting to know whether non-rodent large mammals of veterinary interest including cats, dogs and horses would have the same reaction to oxygen to that found in rodents. Nowadays people regard antioxidants as the so-called 'elixir of life', however, our results cast doubt on this claim at least for some rodents, with mice being an exception."

Provided by University of Surrey

Citation: New research shows sensitivity to oxidative stress is not always linked to aging (2016, May 11) retrieved 5 May 2024 from

<https://medicalxpress.com/news/2016-05-sensitivity-oxidative-stress-linked-aging.html>

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