

# Chronic inflammation accelerates ageing

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(Medical Xpress)—Inflammation could be a key factor in the ageing process academics at Newcastle University have found, and the discovery could help scientists identify new ways of delaying ageing.

In a paper published today in the journal *Nature Communications* the team describe how [inflammation](#) triggers senescence of cells and the release of very powerful molecules, including [oxygen free radicals](#) or [reactive oxygen species](#) (ROS), which have been linked to the [ageing process](#).

## Inflammation linked to ageing

Scientists have long speculated about whether chronic inflammation is more than an innocent bystander in ageing. It has been suggested that inflammation might be responsible for the multiple, apparently unrelated diseases frequently seen in old people and might contribute to shortening lifespan. However, so far it has been extremely complicated to unravel causes from consequences, and the role of inflammation in ageing, if any, has remained a mystery.

Now the team, from the Institutes for Ageing and Cellular Medicine at Newcastle University, have found a way to solve this conundrum by using mice in which a gene that normally limits the inflammatory response was switched off but were otherwise completely healthy.

Thomas von Zglinicki, Professor of Cellular Gerontology at the Institute for Ageing and study leader, said: "We all know the pain and fever

associated with inflammation when our body tries to fight off invading germs that otherwise might make us sick or even kill us.

"While this is a painful but good thing, there is also a darker side to inflammation: While we become older, a mild form of inflammation without any obvious cause becomes increasingly frequent and ultimately chronic. While this chronic inflammation doesn't obviously hurt, it still releases the same powerful messenger molecules that cause the pain and fever in the acute situation."

It turned out these messengers damage cells, especially DNA, which limits the regenerative capacity of multiple tissues in the mice, thus accelerating ageing.

## Delaying ageing

Professor Von Zglinicki added: "People age differently, some much faster than others. We know already that faster ageing is often associated with activated markers of chronic inflammation. With these results we can now seriously start thinking about inflammation as a potential driver of accelerated ageing and how we might be able to delay it."

Diana Jurk, the researcher in the von Zglinicki group who did most of the experiments, said: "The most important result of the study is that treatment with a simple and cheap anti-inflammatory drug, ibuprofen, could reverse the progression of cell senescence and restore the ability of tissues to regenerate."

Derek Mann, Professor of Hepatology and co-leader of this study, said: "We knew very well how these mice developed [chronic inflammation](#) and used them as models for inflammation-related liver disease. However, we never looked at how fast they may [age](#). Once we started looking it was fascinating to see how these mice phenocopied almost all

aspects of normal ageing, just twice as fast as those without inflammation."

**More information:** "Chronic inflammation induces telomere dysfunction and accelerates ageing in mice." Diana Jurk, et al. *Nature Communications* 2, Article number: 4172 [DOI: 10.1038/ncomms5172](https://doi.org/10.1038/ncomms5172). Received 20 November 2013 Accepted 20 May 2014 Published 24 June 2014

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