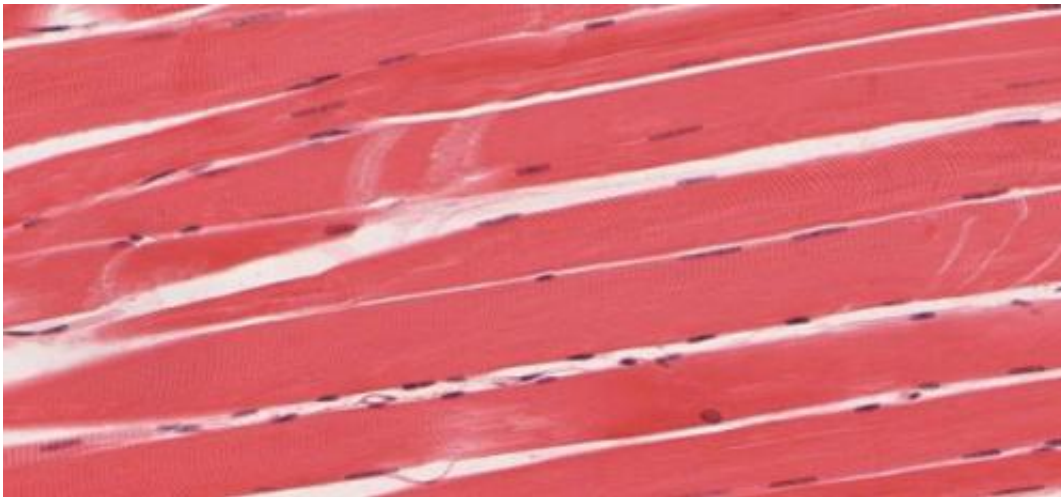


Chronic inflammation causes loss of muscle mass during aging

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Skeletal muscle tissue. Credit: University of Michigan Medical School

People start losing muscle mass at the age of 40—about some 10 percent of the total muscle mass for each 10-year period, which may lead to fall-related injuries, slowing metabolism and reduced quality of life. Today, very little is known as to why muscle mass diminishes with age, but one theory is that it is caused by what has been termed inflammaging. It is characterised by chronic, moderately elevated levels of inflammation markers in the blood.

"We wanted more specifically to examine the correlation between CRP, an inflammaging marker, and [muscle](#) mass in elderly persons," says

Fawzi Kadi, Professor of Sports Physiology and Medicine at Örebro University.

C-reactive protein (CRP) in the blood can be used as a marker for both inflammaging and infection in the body. The results of the study, in which women aged 65 to 70 participated, show a correlation between increased CRP levels in the blood and lower muscle mass.

The research team explored further how CRP affects muscle cell turnover and function by exposing, in a laboratory environment, isolated [muscle cells](#) to CRP.

"We were able to see that muscle [cells](#) exposed to CRP reduced in size. These are new findings which explain the causal link between elevated CRP values and reduced muscle mass. Researchers have previously only been able to find a correlation between the two, using large population studies," says Fawzi Kadi.

However, the researchers were also able to show exactly how CRP affects the size of muscle cells, which has not been done before. Their findings show that CRP affects muscle cells' [protein synthesis](#), that is, the generation of new proteins taking place in all living cells.

"Muscles are our main protein depots. We saw that CRP interferes with the protein synthesis in the muscle cells, hence contributing to the loss of muscle mass," explains Fawzi Kadi.

With researchers for the first time possessing knowledge of the mechanism that links gradual loss of muscle mass to inflammaging, opens up for new studies with a focus on how to counteract the reduction of [muscle mass](#) by controlling levels of [inflammation markers](#).

"A mechanism which explains the connection is of great significance for

both preventive measures and drug development. What is interesting is that inflammaging is a process quietly at work. If we can tackle inflammaging in time, are we then able to postpone the development of a number of chronic diseases?"

In their current studies, it is the preventive measures that Fawzi Kadi, together with his colleague Andreas Nilsson, senior lecturer in Sports Physiology, are focusing on. More particularly, lifestyle factors.

"Andreas Nilsson is leading studies where they look at what effects changed behaviour has on health. If you swapped one hour of watching TV for another activity, what effect would that have for the inflammaging in your body? That's just one example from our studies," says Fawzi Kadi.

In another study, the research team is studying the correlation between inflammaging and physical activity, which will involve analysing the levels of a number of inflammatory biomarkers, including CRP.

More information: Britta Wåhlin-Larsson et al. Mechanistic Links Underlying the Impact of C-Reactive Protein on Muscle Mass in Elderly, *Cellular Physiology and Biochemistry* (2017). DOI: [10.1159/000484679](https://doi.org/10.1159/000484679)

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