

New research identifies biological causes of muscle weakness in later life

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A new largescale genetic analysis has found biological mechanisms that contribute to making people more susceptible to muscle weakness in later life, finding that diseases such as osteoarthritis and diabetes may play a large role in susceptibility.

As we get older we lose [muscle strength](#), and in some people this severe weakness impacts their ability to live [everyday lives](#), a condition called sarcopenia. Around 10 per cent of people over 50 experience sarcopenia. Many causes thought to impact likelihood of developing this weakness, which is linked to higher death rates.

In a [genetic analysis](#) of over 250,000 people aged over 60 from UK Biobank and 21 other cohorts, an international team led by researchers at the University of Exeter looked at handgrip strength, using thresholds of loss of muscle function derived from international definitions of sarcopenia.

The team, including collaborators from the USA and the Netherlands, then conducted a genetic

analysis, and found specific [biological mechanisms](#) push some people towards sarcopenia, whilst protecting others. The study, published in *Nature Communications* identified 15 areas of the genome, or loci, associated with [muscle weakness](#), including 12 loci not implicated in previous analyses of continuous measures of grip strength.

Biomarkers in the blood including [red blood cells](#) and inflammation may also share causal pathways with sarcopenia. Together, these results highlight specific areas for intervention or for identifying those at most risk.

Lead author Garan Jones said: "The strongest associations we found were close to regions of the genome regulating the immune system, and growth and development of the musculo-skeletal system. However we also discovered associations with regions not previously known to be linked to musculo-skeletal traits.

"We found that our analysis of muscle weakness in older people shared common genetic pathways with metabolic diseases such as type-2 diabetes, and auto-immune conditions such as osteoarthritis and rheumatoid arthritis. In subgroups of people with increased risk of these conditions, sarcopenia may be a key outcome to look out for and prevent.

"We hope that by understanding the genetic contributions to muscle weakness with age, we will be able to highlight possible therapeutic interventions earlier in life, which would lead to a happier and healthier old age."

More information: Garan Jones et al. Genome-wide meta-analysis of muscle weakness identifies 15 susceptibility loci in older men and women, *Nature Communications* (2021). [DOI: 10.1038/s41467-021-20918-w](#)

Provided by University of Exeter

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