

First step taken to find causes of muscle wasting disease

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Researchers have gained new insight into the mechanisms involved in how skeletal muscles lose their mass and strength as people age, called sarcopenia.

Sarcopenia is common in older people and is an important contributor to frailty. It affects balance, the way a person moves and their overall ability to perform daily tasks. With an [aging population](#), sarcopenia is a serious global public health problem.

In the first ever study to compare [muscle tissue](#) from groups of older people with sarcopenia across different geographies, researchers identified changes in the cells and molecules within muscle, which may explain why some people develop sarcopenia and some people do not.

The MEMOSA study (Multi-Ethnic MOlecular determinants of human SARcopenia), published in *Nature Communications*, was undertaken by the [EpiGen Global Research Consortium](#) in partnership with Nestlé Research. The study involved participants from the UK, Singapore and Jamaica.

It found that the muscle from individuals with sarcopenia had reduced activity of the key energy-producing pathway and a decrease in activity of the components that make up all five complexes in the energy production pathway critical to maintaining muscle strength and function.

These changes were found in the cohort of men from the Singapore

cohort of the study and replicated in cohorts from the UK (Hertfordshire Cohort Study) and Jamaica.

Moreover, results showed that sarcopenia was also associated with reduced levels of enzymes involved in the recycling of NAD⁺, which acts as a metabolic sensor in the cell and regulates energy production pathways.

The MEMOSA team now plans to explore why the changes in the energy-producing [pathway](#) occur and are looking at genetic and nutritional factors.

Karen Lillycrop, Professor of Epigenetics at the University of Southampton and one of the lead authors, said: "Most studies to date have compared muscle tissue from young people to older people but we wanted to understand why there is variability in the loss of muscle mass and strength between elderly individuals.

"This is a really novel study, using advanced sequencing techniques for the first time, which has allowed us to identify the molecular basis of why some people develop [sarcopenia](#) and others do not in old age."

Professor Keith Godfrey, a co-author at the University of Southampton added: "Sarcopenia is becoming a major health care challenge for all countries, so much so that it was recently recognized as a medical condition. By identifying these differences in activity in key pathways within [muscle](#) cells we can now start to develop therapeutic interventions that will hopefully help a lot of people to remain active and healthy in later life."

Provided by University of Southampton

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