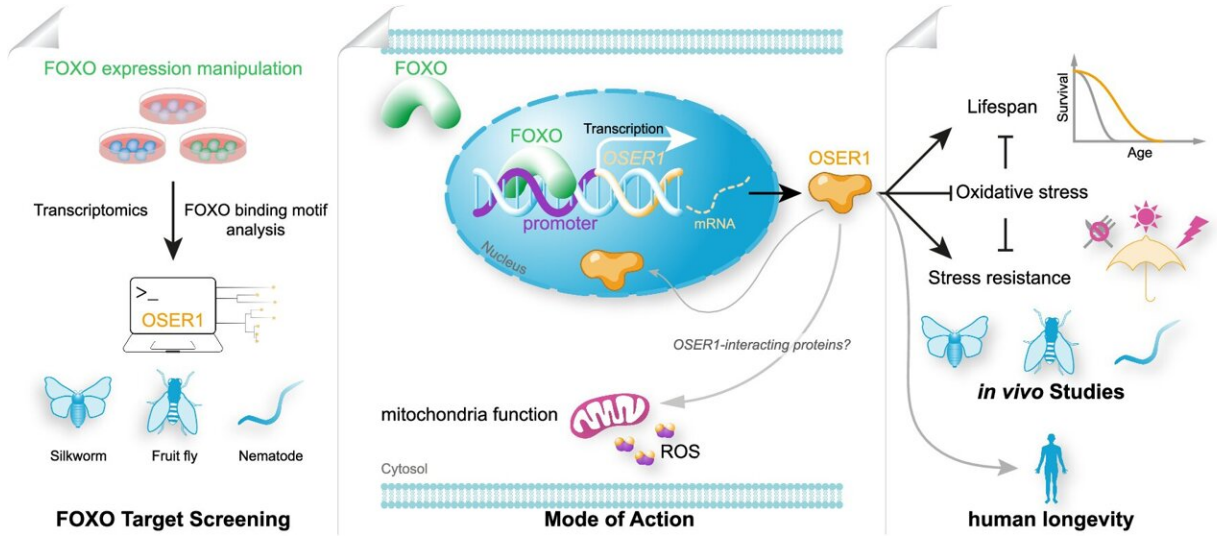
Medical Xpress

Newly discovered gene may influence longevity in humans

September 4 2024



Schematic representation of workflow and model. Credit: *Nature Communications* (2024). DOI: 10.1038/s41467-024-51542-z

Sleep, fasting, exercise, green porridge, black coffee, a healthy social life—there is an abundance of advice out there on how to live a good, long life. Researchers are working hard to determine why some people live longer than others, and how we get the most out of our increasingly long lives.

Now researchers from the Center for Healthy Aging, Department of Cellular and Molecular Medicine at the University of Copenhagen have

discovered that a particular protein known as OSER1 has a great influence on longevity. The research is published in the journal *Nature Communications*.

"We identified this protein that can extend longevity. It is a novel pro-longevity factor, and it is a protein that exists in various animals, such as fruit flies, nematodes, silkworms, and in humans," says Professor Lene Juel Rasmussen, senior author behind the new study.

Because the protein is present in various animals, the researchers conclude that new results also apply to humans.

"We identified a protein commonly present in different animal models and humans. We screened the proteins and linked the data from the animals to the human cohort also used in the study. This allows us to understand whether it is translatable into humans or not," says Zhiquan Li, who is a first author behind the new study.

"If the gene only exists in animal models, it can be hard to translate to human health, which is why we, in the beginning, screened the potential longevity proteins that exist in many organisms, including humans. Because at the end of the day we are interested in identifying human longevity genes for possible interventions and drug discoveries," says Li.

Paving the way for new treatment

The researchers discovered OSER1 when they studied a larger group of proteins regulated by the major transcription factor FOXO, known as a longevity regulatory hub.

"We found 10 genes that, when we manipulated their expression, the longevity changed. We decided to focus on one of these genes that affected longevity most, called the OSER1 gene," says Li.

When a gene is associated with a shorter life span, the risk of premature aging and age-associated diseases increases. Therefore, knowledge of how OSER1 functions in the cells and preclinical animal models is vital to our overall knowledge of human aging and human health in general.

"We are currently focused on uncovering the role of OSER1 in humans, but the lack of existing literature presents a challenge, as very little has been published on this topic to date. This study is the first to demonstrate that OSER1 is a significant regulator of aging and longevity. In the future, we hope to provide insights into the specific age-related diseases and aging processes that OSER1 influences," says Li.

The researchers also hope that the identification and characterization of OSER1 will provide new drug targets for age-related diseases such as metabolic diseases, cardiovascular and neuro degenerative diseases.

"Thus, the discovery of this new pro-longevity factor allows us to understand longevity in humans better," says Li.

More information: Jiangbo Song et al, FOXO-regulated OSER1 reduces oxidative stress and extends lifespan in multiple species, *Nature Communications* (2024). DOI: 10.1038/s41467-024-51542-z

Provided by University of Copenhagen