Sugar makes roundworms live longer, finding may help slow ageing in humans

The Straits Times · 25 Oct 2022 · A16 · Shabana Begum nshab@sph.com.sg

Scientists at Nanyang Technological University (NTU) recently stumbled upon a biological pathway that slows the ageing process in older cells, which could prevent diseases such as diabetes and dementia. The trigger for this pathway? Sugar.

When older roundworms – tiny parasites that grow up to 1mm long – were given more glucose, they lived for about five days longer than those fed a normal diet. Roundworms typically live for 20 days.

Researchers from the NTU School of Biological Sciences found that the added glucose jolted a stress response in the older roundworms' cells, and that molecular response helped the cells regain their youth and stability.

However, more research needs to be done to translate this finding to humans, researchers said.

A stress response refers to a mechanism that rescues cells from unfavourable activities. In this case, the activity is the build-up of unfolded proteins, or defective molecules, in a part of the cells.

This stress response is naturally blunted in older cells due to age, but the added glucose gave the process a boost. Age-related diseases such as diabetes and Alzheimer's disease share common traits, including the harmful accumulation of unfolded proteins in a part of the cells, which can cause cells to die. The stress response fixes this accumulation.

In the lab, roundworms make good models for research on human diseases, as they share genes and molecular pathways similar to that of humans.

When fed more glucose, the aged worms were also more agile and had more energy storage cells than those given a normal diet, which suggested healthier ageing, said Associate Professor Guillaume Thibault, who led the study.

The scientists propose that targeting this stress response pathway in humans may extend the lifespan of seniors with metabolic and agerelated disorders.

This does not mean the elderly should start eating food high in sugar, said Prof Thibault, a cell biologist. He emphasised that the effect glucose had on aged roundworms does not translate directly to humans.

"What this study shows is that triggering certain stress responses in cells may translate to longevity, and activating these responses with a drug might be critical to slowing down cellular ageing in humans," he said.

This is the first time a link between a stress response and ageing has been uncovered, and the findings were published in scientific journal Nature Communications.

The next step is to test the cellular stress response in other animals, such as mice, before looking into humans, said Prof Thibault.

The NTU researchers stumbled upon sugar's role in extending the lifespan of older roundworms five years ago when they were studying diabetes in roundworms. Instead of dying faster when given extra glucose, the older worms lived longer.

The younger worms died faster because the sugar overactivated their well-performing stress response, causing cell death.

Assistant Professor Karen Crasta from the National University Health System Centre for Healthy Longevity said the NTU research shed light on how the unfolded protein response has an effect on ageing.

To further the research, she said it would be interesting to probe the stress response pathways in healthy people aged 90 and above.

"Understanding the causes of ageing and the underlying mechanisms is of paramount significance. Our goal is not to live forever, but to live longer and disease-free till the last moment."