

Drug cocktail that could delay ageing

Lifespan of worms that received drugs nearly doubled – and they lived in good health: Yale-NUS College study

Cheryl Teh

Researchers in Singapore are studying if pharmaceutical drugs can work to not only extend human lives, but also help people live healthier even as they live longer.

This comes after a team of scientists from Yale-NUS College found that the lifespan of a species of microscopic worms was almost doubled when given a combination of pharmaceutical drugs.

In the extended weeks of their life, the worms – from the *Caenorhabditis elegans* species – were also found to be in good health.

The team – led by Dr Jan Gruber, assistant professor of science (biochemistry) at Yale-NUS College – used drugs that targeted some of

the underlying biological processes known to affect the worms' lifespan.

Examples include Metformin, a widely used anti-diabetic drug, and Rapamycin, an immune system modulator that is used during organ transplants to prevent transplant rejection.

When the drugs were combined, the elixir almost doubled the mean lifespan of the worms, which typically live for two to three weeks.

Dr Gruber, who is also with the Yong Loo Lin School of Medicine at the National University of Singapore (NUS), said the effect is greater than any lifespan extension process – where drugs are used – in adult animals to date.

The drugs had no adverse effects on the worms and across all ages, the



Researchers found that the drugs had no adverse effects on the microscopic worms. They were also healthier and spent a larger percentage of their extended lifespans in good health. PHOTO: JAN GRUBER



SOLUTION TO GREYING PROBLEM

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treated worms were healthier and spent a larger percentage of their extended lifespans in good health.

Dr Gruber said if future studies are successful, the application of pharmaceutical drug combinations could help people live longer, while keeping them in a healthier physical state for longer.

The study was published in peer-reviewed international journal *Developmental Cell* earlier this year. While it is a proof of principle, there is still much research to be done before the procedure can be used on people.

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healthy lifespan and delay ageing in people, we can counteract the detrimental effects of an ageing population, providing countries not only medical and economic benefits, but also a better quality of life.

“We would benefit from having longer lives and spending more of those years free from age-related diseases like arthritis, cardiovascular disease, cancer or Alzheimer’s disease,” Dr Gruber said.

The study was carried out in collaboration with researchers from the Singapore Lipidomics Incubator at NUS’ Life Sciences Institute.

Dr Gruber’s team is now also collaborating with Dr Nicholas Tolwinski, a Yale-NUS associate professor of science (life sciences).

Dr Tolwinski, who is also with the Department of Biological Sciences at NUS’ Faculty of Science, previously led a similar study which discovered that a drug cocktail could significantly extend the lifespan of the *Drosophila melanogaster* fruit flies.

The researchers said that if two evolutionarily distinct organisms can experience similar lifespan extensions with drugs, it shows that the underlying biological processes in humans that cause people to be unhealthy as they age could one day be tackled with drugs as well.

Dr Gruber’s team will now move on to examine, among other things, the molecular and biological mechanisms of how the drugs interact to delay ageing and increase lifespan.

He said the ultimate goal is to develop drug interventions safe enough to slow ageing in humans.

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