Could lithium slow down ageing and add years to life?

Lithium could slow down the ageing process, scientists hope  CREDIT:GETTY

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* [Sarah Knapton](http://www.telegraph.co.uk/authors/sarah-knapton/), science editor

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Lithium supplements could slow down ageing, scientists have suggested after noticing that fruit flies lived 16 per cent longer when given low doses. Salts made from the chemical are already used as a mood stabiliser to treat conditions like bipolar disorder, but researchers at [University College London](https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&sqi=2&ved=0ahUKEwi30-zg5vzLAhVEwxQKHcxuCAYQFggdMAA&url=http%3A%2F%2Fwww.ucl.ac.uk%2F&usg=AFQjCNFG8Q63TKVRQESTw3CXFl7MEIIhYQ) and [Harvard University](https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjD-MDn5vzLAhUF7BQKHdFAA4QQFggdMAA&url=http%3A%2F%2Fwww.harvard.edu%2F&usg=AFQjCNGgwKQYRKk2Z2giSXRBH1bfnK5XZw) discovered that it can also protect cells against damage.

It is thought lithium delays ageing by blocking a molecule called glycogen synthase kinase-3 (GSK-3) which is linked to cell death and diseases like diabetes and Alzheimer’s disease. It also promotes a molecule which boosts cell health.

Both molecules are found in humans, and if the same effect was seen as in fruit flies it could extend the average life by 13 years.

The scientists now want to test lithium on larger animals and eventually humans. “To improve our quality and length of life we must delay the onset of age-related diseases by extending the healthiest period of our lives,” said lead researcher, Dr Jorge Iván Castillo-Quan, previously at UCL Institute of Healthy Ageing, now at Harvard Medical School.

*“We found low doses not only prolong life but also shield the body from stress and block fat production for flies on a high sugar diet"*

Dr Ivana Bjedov

“Identifying a drug target for ageing is a crucial step in achieving this and by targeting GSK-3, we could discover new ways of controlling the ageing process in mammals, including humans.”

The study, published today in Cell Reports, shows that male and female flies live longer than average when given low doses of lithium during adulthood or later in life, regardless of their genetic make-up.

At low doses, few adverse effects were seen in the flies as they continued to feed normally and produce healthy offspring.

Different doses of lithium chloride were given to 160 adult flies to measure the effect on [lifespan](https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiSp4vB5vzLAhWDaRQKHZOmAcsQFggcMAA&url=http%3A%2F%2Fwww.telegraph.co.uk%2Fscience%2F2016%2F03%2F12%2Fdeleting-genes-could-boost-lifespan-by-60-per-cent-say-scientist%2F&usg=AFQjCNF16c34vTcSrTJ98kyW36JJN-EKOQ). Higher doses reduced lifespan but lower doses prolonged life by an average of 16 per cent and maximum of 18 per cent compared to a control group given salt.

Even a one off treatment may work to boost lifespan CREDIT: ALAMY /ALAMY

The benefits of lithium were also seen when it was used as a one-off treatment.

Flies that received a one-off dose near the end of their lives lived a maximum of 13 per cent longer. A short course of 15 days for young flies also boosted lifespan.

“We found low doses not only prolong life but also shield the body from stress and block fat production for flies on a high sugar diet,” said co-author Dr Ivana Bjedov from the UCL Cancer Institute.

Principal investigator, Professor Dame Linda Partridge, Director of the [UCL Institute of Healthy Ageing](https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwi6usb75vzLAhWFWBQKHQiyB0oQFggdMAA&url=https%3A%2F%2Fwww.ucl.ac.uk%2Fiha&usg=AFQjCNEHydnBG8UXQllGbfgrACjEZqvxvQ) and the Max Planck Institute for Biology of Ageing, said: “Our aim is to identify ways to intervene in ageing, with the end goal of keeping us all healthier for longer and compressing the time at the end of life when we suffer from physical decline and diseases.

“This can be done by diet, genetics or drugs, which is why we want to identify promising drug targets.

“The response we’ve seen in flies to low doses of lithium is very encouraging and our next step is to look at targeting GSK-3 in more complex animals with the aim of eventually developing a drug regime to test in humans.”

Claire Bale, Head of Research Communications at[Parkinson’s UK](https://www.google.co.uk/aclk?sa=l&ai=CIuUxm3cGV_8_wcTLA-2otJAL-fmpmQnR6YTatAHwjLwHCAAQAWC7vq6D0AqgAaeV_NsDyAEBqgQiT9CUulX6pTNvjzMOjabtfurx_BDS3biwb-B-M4P2B1KCRYAHweqDJJAHAagHpr4b2AcB&sig=AOD64_1wRGZKxrf4Bnigs3yiN1BN0Vzprw&clui=0&q=&ved=0ahUKEwiEiKH05vzLAhVDJpoKHZNEDFYQ0QwIGg&adurl=http://www.parkinsons.org.uk), which part-funded the study, said: “It’s encouraging to see that the researchers have been able to identify a key piece of the ageing puzzle, which one day may allow us to intervene in the ageing process.

 “This research has the potential to not only help create a healthier older generation, but also provide significant insights into how we could potentially treat or even prevent conditions of ageing like Parkinson’s.”