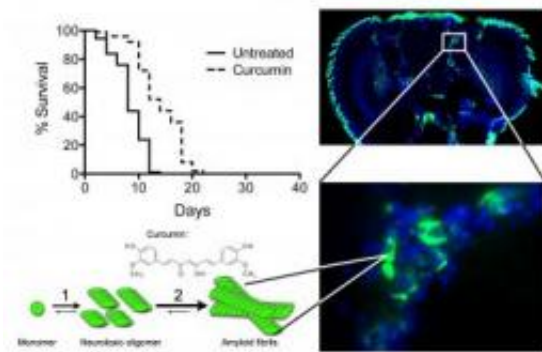


Turmeric-based drug effective on Alzheimer flies

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Above left are the survival curves for "Alzheimer flies" treated (dashed line) and those not treated with curcumin. The flies that were administered curcumin lived longer and were more active. The scientists identified an accelerated formation of amyloid plaque in the treated flies, which seemed to protect the nerve cells. On the right we see microscopic images of neurons (blue) and plaque (green) in the fruit fly's brain. The study strengthens the hypothesis that a curcumin-based drug can contribute to toxic fibrils being encapsulated (bottom left of the figure). Credit: Per Hammarström, Ina Caesar

Curcumin, a substance extracted from turmeric, prolongs life and enhances activity of fruit flies with a nervous disorder similar to Alzheimers. The study conducted at Linköping University, indicates that it is the initial stages of fibril formation and fragments of the amyloid fibrils that are most toxic to neurons.

Ina Caesar, as the lead author, has published the results of the study in the prestigious journal *PLoS One*.

For several years curcumin has been studied as a possible drug candidate to combat Alzheimer's disease, which is characterized by the accumulation of sticky amyloid-beta and Tau protein fibres. Linköping researchers wanted to investigate how the substance affected transgenic [fruit flies \(*Drosophila melanogaster*\)](#), which developed evident Alzheimer's symptoms. The fruit fly is increasingly used as a model for neurodegenerative diseases.

Five groups of diseased flies with different genetic manipulations were administered curcumin. They lived up to 75 % longer and maintained their mobility longer than the sick flies that did not receive the substance.

However, the scientists saw no decrease of amyloid in the brain or eyes. Curcumin did not dissolve the amyloid plaque; on the contrary it accelerated the formation of fibres by reducing the amount of their precursor forms, known as oligomers.

–The results confirm our belief that it is the oligomers that are most harmful to the nerve cells, says Professor Per Hammarstrom, who led the study.

–We now see that small molecules in an animal model can influence the amyloid form. To our knowledge the encapsulation of oligomers is a new and exciting treatment strategy.

Several theories have been established about how oligomers can instigate the disease process. According to one hypothesis, they become trapped at synapses, inhibiting nerve impulse signals. Others claim that they cause cell death by puncturing the cell membrane.

Curcumin is extracted from the root of herbaceous plant turmeric and has been used as medicine for thousands of years. More recently, it has been tested against pain, thrombosis and cancer.

More information: Curcumin promotes A-beta fibrillation and reduces neurotoxicity in transgenic *Drosophila* by Ina Caesar, Mary Johnson, K. Peter R. Nilsson, Stefan Thor and Per Hammarström. *PLoS One* 7(2), 13 February 2012

Provided by Linköping University

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