Research on life expectancy in fruit flies opens up a new line of inquiry into longevity

4 February 2015

This image shows an example of gene-switching -- in this case, used to drive Green Fluorescent Protein (GFP) expression in the fat tissue of the fly on the right. Credit: John Tower / USC

Some studies on the genetic roots of aging will need a second look after the discovery that a common lab chemical can extend the life span of female fruit flies by 68 percent.

For years, scientists have engineered fruit flies whose genes can be turned on and off by a synthetic hormone, allowing detailed studies of the effects of single genes on life span. Many of the genes have close relatives in humans.

Unfortunately, the hormone used to perform the studies turns out to be anything but neutral.

John Tower, professor of biological sciences at the USC Dornsife College of Letters, Arts and Sciences, had been studying genetic causes of aging by turning genes off and on in flies. He and lab member Gary Landis grew suspicious of the hormone that they and others were using to activate the genes - mifepristone, a synthetic chemical known to terminate pregnancy in humans.

Many studies have shown that reproduction shortens lifespan in flies and other organisms. Tower and coworkers wondered if the hormone they were using could be affecting reproduction in flies, and in turn their life span.

They discovered that flies exposed to the hormone laid only half the usual amount of eggs - and lived 68 percent longer, from a median age of 56 to 94 days.

The mifepristone had little or no effect on the life expectancy of female flies that had not mated, which had an even better overall survival rate and maximum lifespan.

Tower and his team published their findings online Jan. 15 in the journal *Aging*.

"This opens up a new line of inquiry for longevity studies, and identifies candidate genes and mechanisms for regulating the trade-off between reproduction and lifespan that may be shared with humans," Tower said. "It does, however, mean that our earlier longevity studies that relied on mifepristone as a gene switch will need to be reevaluated."

More information:
www.impactaging.com/papers/v7/n1/full/100721.html

Provided by University of Southern California