

# Reproduction and life span are intertwined

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The gonad is well known to be important for reproduction but also affects animal life span. Removal of germ cells – the sperm and egg producing cells – increases longevity of the roundworm *Caenorhabditis elegans*. However, the underlying molecular mechanisms were a mystery. Now scientists at the Cologne-based Max Planck Institute for Biology of Ageing, have discovered that germ cell removal flips a "molecular switch" that extends the life span by using components of a "developmental clock".

The roundworm [Caenorhabditis elegans](#) is a commonly used [model organism](#) in the field of ageing research. It develops from an egg to adult through four larval stages. These developmental stages are controlled by a developmental clock. Yidong Shen and colleagues working in the department of Director Adam Antebi used a laser to remove the germ cells. They found that the remaining gonadal cells trigger production of a steroid hormone called dafachronic acid. Dafachronic acid activates so-called microRNAs, which work as tiny molecular switches causing changes in gene expression that promote longevity. Interestingly, this same steroid hormone-microRNA switch was previously shown by Antebi and colleagues to be part of the developmental clock. Thus, the loss of the [germ cells](#) ultimately causes the worm to use developmental timers to put in motion a life-prolonging programme.

In uncovering these findings, the Max Planck scientists have added some more pieces to the puzzle of describing and understanding how longevity is regulated. The question now is whether humans also possess a similar microRNA-controlled switch system.

**More information:** Yidong Shen, Joshua Wollam, Daniel Magner, Oezlem Karalay, Adam Antebi. A steroid Receptor–microRNA switch regulates life span in response to signals from the gonad. *Science* 14 December 2012: Vol. 338 no. 6113 pp. 1472-1476 [DOI: 10.1126/science.1228967](https://doi.org/10.1126/science.1228967)

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