

# Eggs without yolk can hatch too

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Biologists from KU Leuven, Belgium, have discovered that eggs of the roundworm *C. elegans* can hatch without yolk. Credit: Liesbet Temmerman and Liesbeth Van Rompay

Most animals reproduce by laying eggs. As the embryo develops, its feeds on the egg yolk. No egg yolk, no offspring, then? Not always. Biologists from KU Leuven, Belgium, have discovered an exception to the rule: the eggs of nematodes (roundworms) can also hatch without egg yolk. The findings were published in *Scientific Reports*.

Parasitic worm infections are usually treated with drugs that paralyse the [worms](#). Unfortunately, many parasites have already become resistant to these products. In addition, some treatments may have unpleasant side effects for the host as well. "That is one of the reasons why we started

studying the reproduction of worms", Dr Liesbeth Van Rompay explains. "Parasites lay many eggs in a short amount of time, so we could try to limit their reproduction. We examined this in *C. elegans*, a roundworm that is genetically related to [parasitic worms](#) and can be cultured without a host."

Originally, Van Rompay set out to map the genes that are necessary for [egg yolk](#) production. Some of these genes have 'lookalikes' in the human genome. Other genes, however, are completely different in or even unique to worms. This last group makes an interesting target for new deworming products without side effects on humans.

The study, however, soon took an unexpected turn. After the researchers had deactivated some of the genes, the worms laid eggs that were virtually yolk-free. And against all expectations, these eggs hatched. "Our yolk-less embryos developed without major difficulties. This has never been observed in egg-laying animals before."

That does not mean we should simply dismiss one of biology's basic hypotheses - no egg yolk, no offspring. "Research has already shown that most animal embryos need egg yolk to develop", Professor Liesbet Temmerman emphasises. "And in this particular roundworm - and possibly other animals as well - the egg yolk may still play a role in the new-borns' first stage of life. When food is in limited supply, young larvae that could rely on yolk in their eggs tend to do better than the ones from yolk-free eggs."

The researchers suspect that worms have a back-up for the yolk to guarantee the survival of their offspring. Temmerman continues, "are there any other differences between worms from [eggs](#) with and without yolk? If there is no yolk in the egg, what is the embryo's food source? These are the mysteries we want to unravel next. If we want to prevent parasites from reproducing, we need to take away that other [food source](#)

as well."

**More information:** Liesbeth Van Rompay et al. New genetic regulators question relevance of abundant yolk protein production in *C. elegans*, *Scientific Reports* (2015). [DOI: 10.1038/srep16381](https://doi.org/10.1038/srep16381)

Provided by KU Leuven

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