These tiny park-dwelling worms may reshape how human skin recovers after injury

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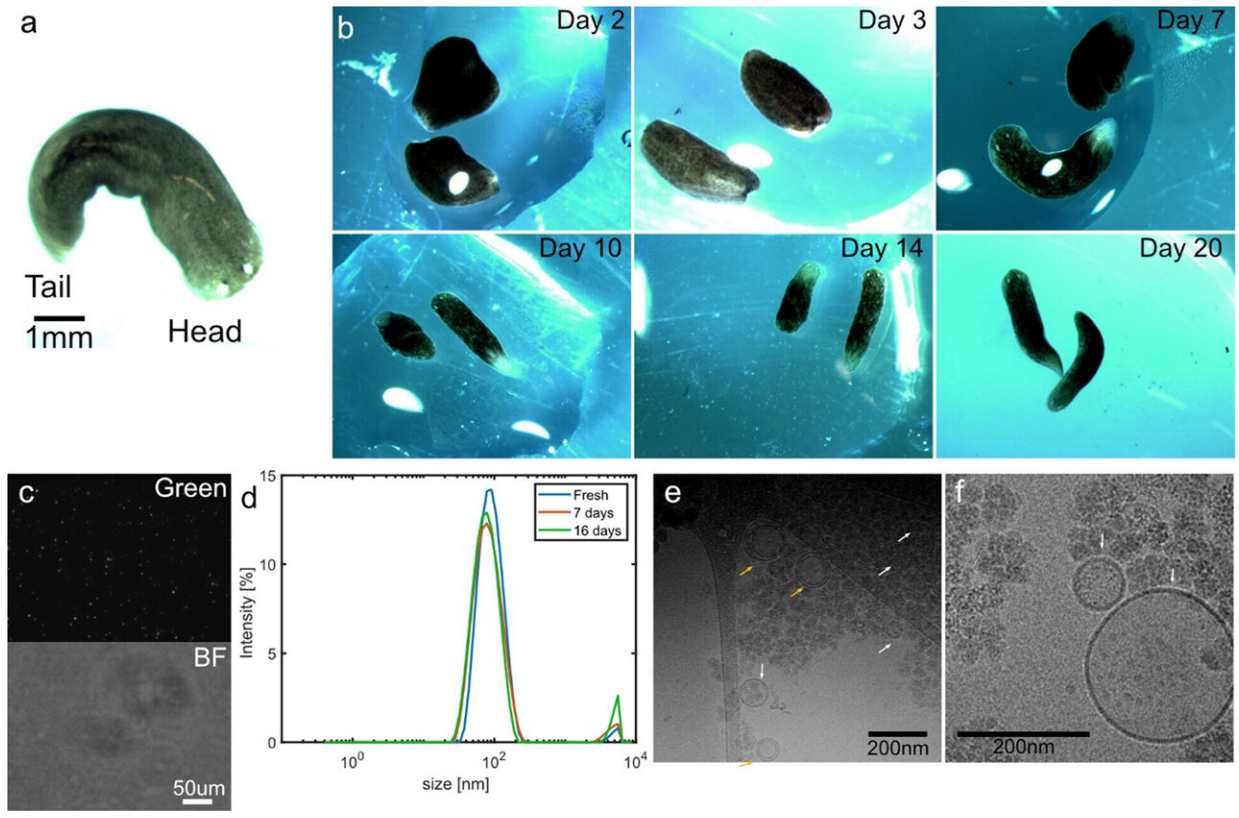

Planarian regeneration, EV extraction and analysis. Credit: *ACS Omega* (2026). DOI: 10.1021/acsomega.5c11592

Researchers from Lund University in Sweden collected wild flatworms from Malmo's largest park, Pildammsparken. These creatures are masters at regenerating after injury. Now, for the first time, the worms'

unique ability to regenerate has been harnessed to help accelerate wound healing in human skin models.

From curiosity to skincare science

A research team at Lund University was recently contacted by researchers at a Korean skincare company. They were interested in studying the regenerative capacity of Scandinavian flatworms. The next step was to investigate if they could be used for skin therapeutics.

"We were very surprised because we're not a flatworm lab, but the science felt exciting—tackling an unexpected research question that no one had addressed before," says Martin Hjort, an associate researcher in Chemical Biology and Therapeutics at Lund University.

Flatworms are interesting because of their ability to regenerate. In fact, they can reproduce up to 200 individuals from just a small part of themselves. This type of research into flatworms is still in its infancy, but a couple of early studies have found that small messenger packets (exosomes) containing signaling molecules can repair tissue within the host organism.

Exosomes are exchanged between cells and influence growth, gene expression, and the immune system. The Lund University researchers therefore wondered whether these signaling molecules might also have a regenerative effect in other organisms—something that had not previously been tested.

Catching wild flatworms

"To investigate this, we decided to collect wild flatworms. Although there are established flatworm models that are cultivated in a laboratory

setting, we wanted to bring our research closer to the organism as it exists in the wild," explains Rakel Bjurling, then a research fellow in Chemical Biology and Drug Development at Lund University.

She was the one responsible for catching the wild flatworms. Traps baited with raw chicken meat were set and placed in the ponds of Pildammsparken in Malmo. The 5-millimeter-long flatworms made their way into the traps and ate until they were so full that they became too fat to get out again. In the lab, Rakel Bjurling cut the worms in half so that they would release their exosomes.

Nine days after division, the "tail end" of the flatworm had developed eyes, and after two weeks, both worms had reached the same size as the first worm had been before it was split in two. This is the first time that exosomes have been extracted from wild flatworms.

"Exosomes are about the same size as viruses, which makes the work incredibly fiddly," continues Bjurling.

Testing flatworm exosomes on human skin

After the researchers had collected the exosomes, they applied them to human skin models—the same kind that cosmetics companies use when testing make-up. They then observed that the skin became thicker when they added the signaling molecules. When they punctured the skin to create a wound, wound healing was also significantly accelerated. Even the blood vessels affected by burns healed more quickly with the help of flatworm exosomes.

"The study suggests that signaling molecules from flatworms can accelerate the human body's own healing processes. This is the first time anyone has shown that it is possible to use the regenerative ability from a flatworm in another organism," says Hjort.

From lab discovery to potential cream

The Korean skincare company plans to develop a therapeutic cream based on flatworm exosomes. However, although the Lund researchers have applied for a patent, this is still at the basic research stage. And developing beauty products is not part of the researchers' remit. "This is an exciting and somewhat unusual research project, but for us at Lund University, it is the worms' regenerative ability that is of interest," concludes Hjort.

The study is published in the journal *ACS Omega*.

More information: Rakel Bjurling et al, Wild-Type Scandinavian Planarian-Derived Extracellular Vesicles Accelerate Skin Wound Healing in Burn and Mechanical Injuries, *ACS Omega* (2026). DOI: 10.1021/acsomega.5c11592

Provided by Lund University