

Hilde Mangold

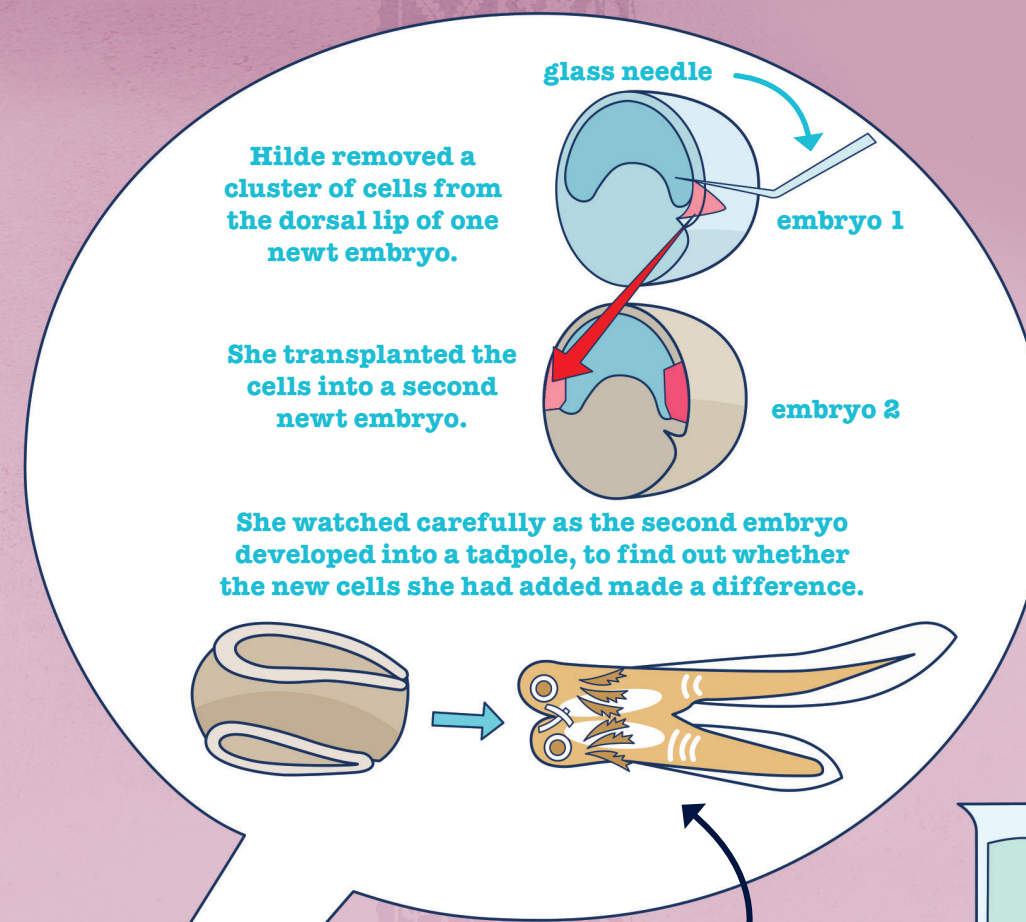
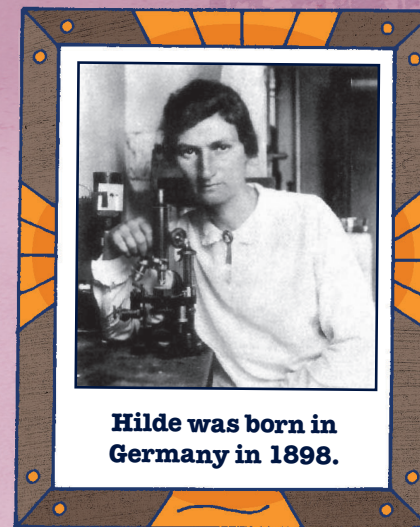
Hilde was the middle sister of three. She was born at a time when girls didn't get the same opportunities as boys. At first, Hilde was sent to a boarding school to learn good manners and housekeeping – but she rebelled! She ended up at university, studying chemistry, biology and zoology.

When she was a student, Hilde went to a talk by a top zoologist called Hans Spemann. He was trying to find out how animals develop and grow.

All animals start as a single cell: a fertilised egg. As they grow, they develop a body made up of millions of cells. Skin cells are different from nerve cells. Fat cells are different from heart cells. We know that cells make copies of themselves, but there is a question we haven't yet been able to answer. How does each new cell 'know' which type of cell it's supposed to be?

Hilde was fascinated. She asked Hans if she could come and work with him, and he agreed. Until then, Hilde had been learning what other scientists had found out. But from that point on, she began carrying out her own research.

Hans asked Hilde to study one tiny part of a developing newt embryo, called the 'dorsal lip'. He had worked out that it was important, but he didn't know why. Hilde carried out an experiment to find out what the dorsal lip did.



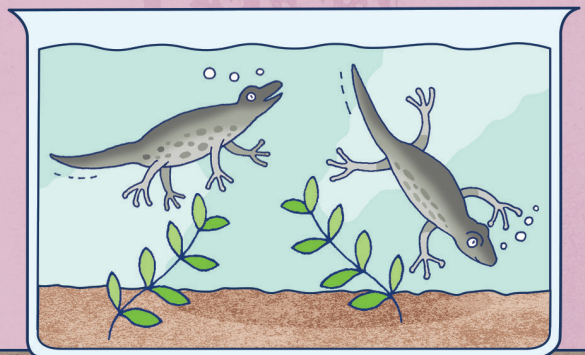
An embryo is an unborn animal in the process of development.

The developing embryos that Hilde worked with were just 1.5 mm wide, but she was excellent at working carefully.

• ← 1.5 mm

She carried out the operations using tiny glass needles and single strands of hair. She did this 259 times! Scientists often repeat an experiment many times, so they can be sure the results aren't just by chance.

The results were amazing. The second embryo became a newt tadpole with two heads, spines and nervous systems. The cluster of cells from the first embryo had 'reprogrammed' cells from the second embryo.



Hans named this cluster of cells the 'organiser'. It had the power to organise nearby cells, telling them what part of a newt they should grow into. Hilde and Hans realised that other animals must have 'organiser' cells too. Body cells don't just follow their own instructions as they develop. They get clues from nearby cells as well.

The discovery was so important that it won a Nobel Prize in 1935. Sadly, Hilde had died in an accident, so the prize could only go to Hans. But their amazing discovery is still known as the Spemann-Mangold organiser.

In 2018, almost a century after Hilde's discovery, scientists proved that human embryos also have organiser cells. In the future, this could lead to new types of medicine, allowing doctors to grow the specific cells needed to treat a certain disease or condition.