

# Newborn heart muscle can grow back by itself

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In a promising science-fiction-meets-real-world juxtaposition, researchers at UT Southwestern Medical Center have discovered that the mammalian newborn heart can heal itself completely.

Researchers, working with mice, found that a portion of the [heart](#) removed during the first week after birth grew back wholly and correctly – as if nothing had happened.

"This is an important step in our search for a cure for heart disease, the No. 1 killer in the developed world," said Dr. Hesham Sadek, assistant professor of internal medicine and senior author of the study available online in the Feb. 25 issue of *Science*. "We found that the heart of newborn mammals can fix itself; it just forgets how as it gets older. The challenge now is to find a way to remind the adult heart how to fix itself again."

Previous research has demonstrated that the lower organisms, like some fish and amphibians, that can regrow fins and tails, can also regrow portions of their hearts after injury.

"In contrast, the hearts of adult mammals lack the ability to regrow lost or damaged tissue, and as a result, when the heart is injured, for example after a heart attack, it gets weaker, which eventually leads to heart failure," Dr. Sadek said.

The researchers found that within three weeks of removing 15 percent of

the newborn mouse heart, the heart was able to completely grow back the lost tissue, and as a result looked and functioned just like a normal heart. The researchers believe that uninjured beating heart cells, called cardiomyocytes, are a major source of the new cells. They stop beating long enough to divide and provide the heart with fresh cardiomyocytes.

Dr. Eric Olson, chairman of molecular biology and co-senior author of the study, said that this work is fascinating.

"The inability of the adult heart to regenerate following injury represents a major barrier in cardiovascular medicine," said Dr. Olson, who directs the Nancy B. and Jake L. Hamon Center for Basic Research in Cancer and the Nearburg Family Center for Basic and Clinical Research in Pediatric Oncology. "This work demonstrates that cardiac regeneration is possible in the mammalian heart during a window of time after birth, but this regenerative ability is then lost. Armed with this knowledge, we can next work to discover methods to reawaken cardiac regeneration in adulthood."

The next step, the researchers said, is to study this brief window when the heart is still capable of regeneration, and to find out how, and why, the heart "turns off" this remarkable ability to regenerate as it grows older.

Provided by UT Southwestern Medical Center

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