

New study shows much longer survival for heart transplants across species

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A new immune-suppressing therapy has led to the longest survival yet for a cross-species heart transplant, according to new research conducted in part by researchers at the University of Maryland School of Medicine (UM SOM).

The study involved transplanting pig hearts into baboons. The results could lead to increased use of xenotransplantation, the transplantation of organs from one species to another. Researchers hope this approach could eventually be used in humans, helping the severe organ shortage among patients awaiting transplantation.

The study, which was conducted at the National Heart, Lung, and Blood Institute (NHLBI), part of the National Institutes of Health, was [published yesterday](#) in *Nature Communications*.

A key problem with using xenotransplantation with humans is that the [immune system](#) reacts very strongly, which can cause [organ rejection](#). Scientists have tried modifying the [organ donor](#)'s genes and developing novel immune-suppressing drugs for the [organ recipients](#).

In the current study, scientists developed a novel immune-suppressing drug regimen that includes a key antibody, called anti-CD40 antibody, which may help the organ resist the immune system response. The researchers used pigs that had been genetically modified to have high immune system tolerance and then transplanted hearts from these animals into a group of five baboons. The pig [heart](#) did not replace the

baboon heart, but was an additional organ. Both the new and original hearts continued to pump blood.

With the new immune-suppressing drugs, the pig hearts survived for up to 945 days in the baboons - much longer than previous pig-to-primate heart transplants. The immune-suppressing drugs played a key role in this.

"This has the potential to really move the field forward," said Richard Pierson, a professor of surgery at UM SOM, one of the co-authors. He has studied xenotransplantation for three decades. "This new approach clearly made a difference. We obviously have a lot more work to do, but I'm confident that eventually this will be useful to human patients."

The study's lead author was Muhammad Mohiuddin, MD, chief of the transplantation section in the Cardiothoracic Surgery Research Program at the NHLBI.

Provided by University of Maryland School of Medicine

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