



Animal to Human Transplants (Xenotransplantation)

Why in News

Recently, in a medical first, doctors transplanted a pig heart into a patient in a last-ditch effort to save his life in the US.

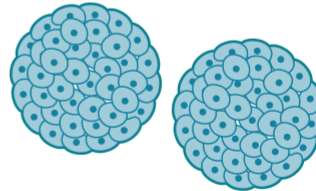
[//](#)

Genetically engineering pigs as organ donors

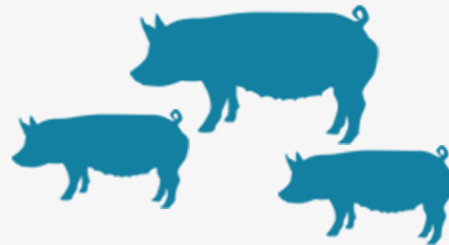
- ① Adding and removing genes with gene-editing technology creates genetically-altered pig cells



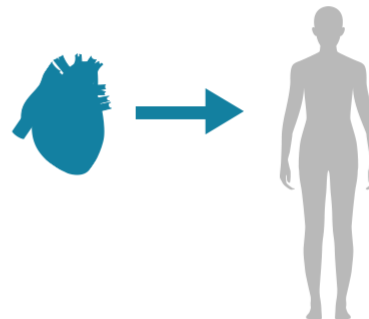
- ② These are used to make pig embryos



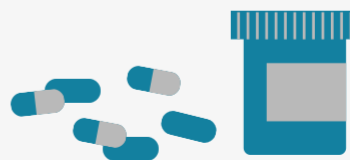
- ③ The genetically-engineered pigs are raised in a controlled, bio-sealed environment



- ④ The organ is removed from adult pig and transplanted into patient



- ⑤ Patient must still take immunosuppressant drugs, to prevent their body rejecting the new organ



Key Points

▪ About:

- Xenotransplantation involves the transplantation of nonhuman tissues or organs into

human recipients.

- This is the first successful transplant of a pig's heart into a human being. However, it's too soon to know if the operation really will work.
- This time, a heart from a pig that had **undergone gene-editing** has been used to remove a sugar in its cells that's responsible for that hyper-fast organ rejection.
 - Genome editing (also called **gene editing**) is a group of technologies that give scientists the ability to change an organism's **Deoxy-Ribonucleic Acid (DNA)**.
- Prior attempts at such transplants — or xenotransplantation have failed. One of the **biggest obstacles** to transplantation is **organ rejection**.
- This has **re-sparked a debate over the use of pigs for human transplants**, which many animal rights groups oppose.

▪ **Significance:**

- This development could bring us one step closer to solving the global organ shortage.
 - In India, patients need 25,000-30,000 liver transplants annually. But only about 1,500 end up receiving them.
- Pigs are increasingly becoming popular candidates for organ transplantation.
 - Pigs offer **advantages over primates for organ procurements**, because they are easier to raise and achieve adult human size in six months.
 - Pig heart valves are routinely transplanted into humans, and some patients with diabetes have received porcine pancreas cells.

Source: DTE

PDF Refernece URL: <https://www.drishtias.com/printpdf/animal-to-human-transplants-xenotransplantation>