



# Xenotransplantation

## Why in News?

Genetically modified pig heart took longer than usual to beat for human receiver in the [first-ever transplant of the gene-edited pig heart to human](#). The human recipient **lived only for 61 days after the transplant**.

- **Prior attempts** at such transplants have **also failed**.



# Genetically engineering pigs as organ donors

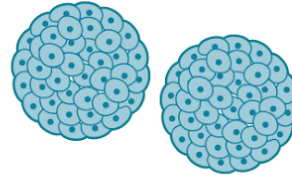
①

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



②

These are used to make pig embryos



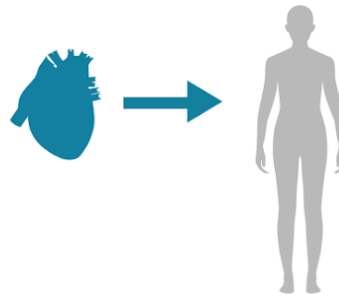
③

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



## What is Xenotransplantation?

### ▪ About:

- Xenotransplantation involves the **transplantation of nonhuman tissues** or organs **into human recipients**.
  - In the recent heart transplant from pig to human, **gene-editing** was adopted 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 \(DNA\)](#).

- One of the **biggest obstacles** to transplantation is **organ rejection**.
- **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.
      - The pig's anatomical and physiological parameters are similar to that of humans, and the breeding of pigs in farms is widespread and cost-effective.

[Source: DTE](#)

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