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1. First human recipient of pig kidney transplant dies: What is xenotransplantation, why pigs are used

Why in News?

The first recipient of a modified pig kidney transplant passed away recently, around two months after the surgery was carried out. The family members of 62-year-old Richard "Rick" Slayman and the Massachusetts General Hospital, where the procedure was performed, did not link the transplant operation to his death.

What is xenotransplantation?

According to the US Food and Drug Administration (FDA), "Xenotransplantation is any procedure that involves the transplantation, implantation or infusion into a human recipient of either (a) live cells, tissues, or organs from a nonhuman animal source, or (b) human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs."

Essentially, it is the use of animal cells and organs to heal humans. Xenotransplantation involving the heart was first tried in humans in the 1980s. The need for such a procedure was felt because of the significant gap between the number of transplantations needed by patients and the availability of donor organs.

According to one estimate, In the United States alone, there are nearly 90,000 people waiting for a kidney transplant, and more than 3,000 people die every year while still waiting.

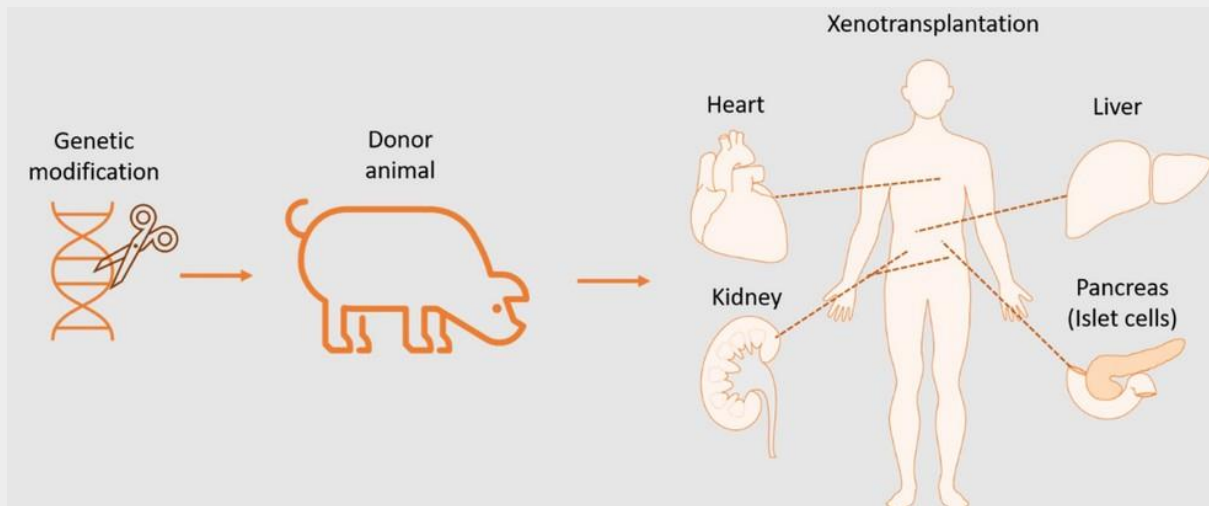
How does xenotransplantation happen?

Sewing a pig kidney into a donated body isn't much different than a regular transplant, and "post-surgery immune-suppressing drugs are standard, too."

But there are several crucial additional steps. For one, the animal organ selected has to undergo genetic modifications, so that the human body does not reject it.

A report from the Harvard Medical School, whose physicians were involved in Slayman's operation, said 69 genomic edits were made to the pig kidney in his case. The gene editing technology CRISPR-Cas9 was employed to "Remove certain pig genes that produce sugars with antibodies our immune systems react to" and "Add certain human genes to improve the kidney's compatibility with humans."

Even after the operation, constant monitoring needs to be done to check the body's response to the organ.



Why are pigs often used for xenotransplantation?

Pig heart valves have been used for replacing damaged valves in humans for over 50 years now. 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.

Also, many varieties of pig breeds are farmed, which provides an opportunity for the size of the harvested organs to be matched with the specific needs of the human recipient.

In January 2022, the first xenotransplantation of a genetically-modified pig heart was done. However, the patient passed away after two months due to a range of factors, including being tainted with a latent virus in the pig heart, which may have contributed to the dysfunction of the transplant.

What are the complications in xenotransplantation?

First, it has to be ensured that the body does not reject the organ. One method of doing this is embedding the pig's thymus gland, responsible for "educating" the immune system, underneath the outer layer of the kidney. This helps keep away any new or delayed immune responses.

There are concerns of potential infection of recipients with both recognised and unrecognised infectious agents and the possible subsequent transmission to their close contacts and into the general human population.

Another public health concern is the possibility of cross-species infection by retroviruses, which may be latent and lead to disease years after infection.

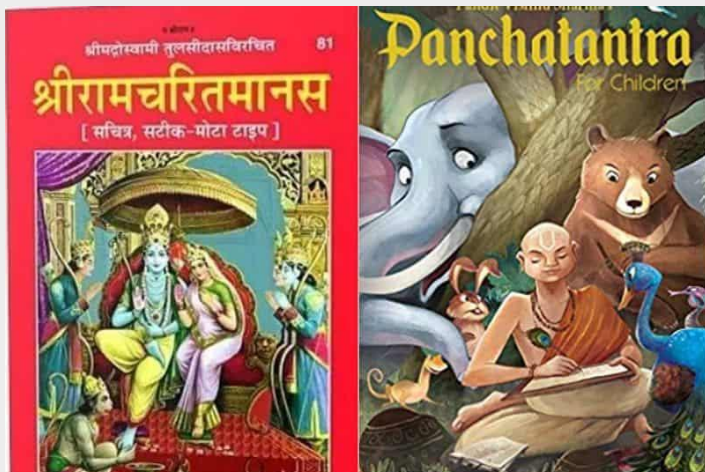
Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

2. Ramcharitmanas, Panchatantra, and Sahṛdayāloka-Locana enter 'UNESCO's Memory of the World Asia-Pacific Regional Register'

Why in News?

The Ramcharitmanas, Panchatantra and Sahṛdayāloka-Locana have been included in 'UNESCO's Memory of the World Asia-Pacific Regional Register'. It signifies a step forward in global cultural preservation efforts, highlighting the importance of recognizing and safeguarding the diverse narratives and artistic expressions that shape our shared humanity



It is noteworthy that 'Sahṛdayaloka-Locana', 'Panchatantra', and 'Ramcharitmanas' were authored by Acharya Anandvardhan, Pt. Vishnu Sharma, and Goswami Tulsidas, respectively.

Role of Indira Gandhi National Centre for the Arts

The Indira Gandhi National Centre for the Arts (IGNCA), played a vital role in securing a historic moment during the 10th meeting of the Memory of the World Committee for Asia and the Pacific (MOWCAP). At the gathering in Ulaanbaatar, 38 representatives from member states convened alongside 40 observers and nominees. Advocating for three Indian nominations, IGNCA ensured their placement in 'UNESCO's Memory of the World Asia-Pacific Regional Register'. This marks the first time IGNCA has submitted nominations to the Regional Register

since its inception in 2008.

After undergoing rigorous deliberations and receiving recommendations from the Register Subcommittee (RSC), and subsequent voting by member state representatives, all three nominations secured inclusion.

Memory of the World Programme

UNESCO's Memory of the World (MoW) Programme is an international initiative launched to safeguard the documentary heritage of humanity against collective amnesia, neglect, decay over time and climatic conditions, as well as deliberate destruction. It calls for the preservation of valuable archival holdings, library collections, and private individual compendia all over the world for posterity, the reconstitution of dispersed or displaced documentary heritage, and increased accessibility to, and dissemination of, these items.

Overview

The Memory of the World Register is a compendium of documents, manuscripts, oral traditions, audio-visual materials, library, and archival holdings of universal value. Inscription on the register leads to improved conservation of the documentary heritage by calling upon the program's networks of experts to exchange information and raise resources for the preservation, digitization, and dissemination of the material. The program also uses technology to provide wider accessibility and diffusion of the items inscribed on the register.

Any organization or individual can nominate a documentary item for inscription on the register via UNESCO Member States through their National Commission for UNESCO or, in the absence of a National Commission, the relevant government body in charge of relations with UNESCO, involving, if one exists, the relevant national MoW committee. Two proposals per UNESCO Member State are considered in each nomination cycle, joint nomination proposals from two or more UNESCO Member States are unlimited. During its meetings, the International Advisory Council (IAC) examines the full documentation of the item's description, origin, world significance, and contemporary state of conservation. The IAC recommends to the Executive Board of UNESCO the items proposed for inscription.

Relevance: GS Prelims; International Organisations
Source: PIB

3. India- France joint military exercise Shakti commences in Meghalaya

Introduction

The 7th edition of India- France Joint Military Exercise SHAKTI is being held at Umroi, in a fully developed and modern Foreign Training Node in Meghalaya. The Exercise is scheduled to be conducted from 13th to 26th May 2024.



Aim of Exercise

SHAKTI is to enhance joint military capability of both sides to undertake multi-domain operations. The joint exercise will focus on operations in the semi-urban and mountainous terrain. Objectives to be achieved from the joint training are high degree of physical fitness, rehearsing and refining drills for operations at tactical level and sharing of best practices.

Relevance: GS Prelims & Mains Paper II; Bilateral Relations
Source: PIB