

Xenotransplantation and Retrovirus

Modifying the pig genomes to remove antigen coding genes, add human genes and eliminate pig viruses, resulted in long-term survival of the monkey recipients, up to around two years.

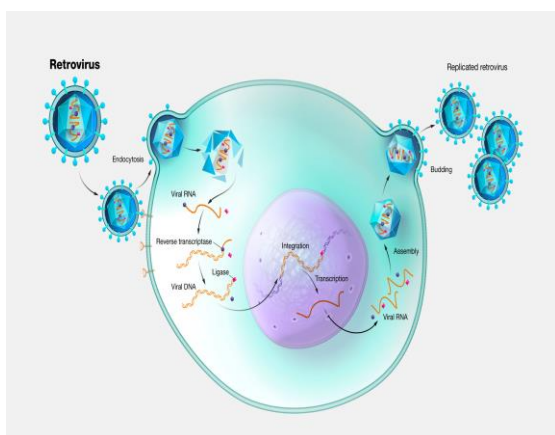
The transplantation of animal organs into humans (xenotransplantation) may offer a solution to the worldwide organ shortage.

Previous work has identified three glycan antigens expressed in pigs that are recognized by human antibodies and attacked, leading to rejection of the organ.

The porcine endogenous retrovirus has also been identified as a risk for transmission into humans.

Retrovirus

A retrovirus is a type of virus that inserts a DNA copy of its RNA genome into the DNA of a host cell that it invades, thus changing the genome of that cell.



LIDAR Technology

Researchers searched 5,315 sq. km of LIDAR survey data and discovered 24 unreported human made earthworks, including fortified villages, in regions across the Amazon basin (Science). But the LIDAR survey data covered only 0.08% of the total area of Amazonia.

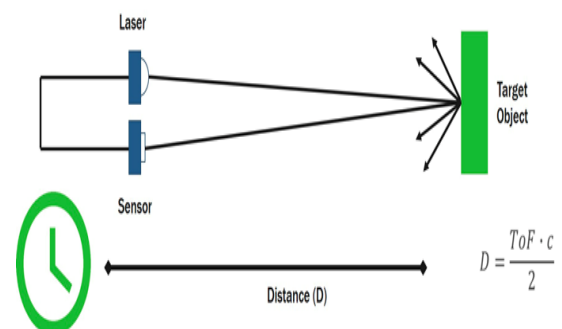
LiDAR is an acronym for Light Detection and Ranging. In LiDAR, laser light is sent from a source (transmitter) and reflected from objects in the scene.

The reflected light is detected by the system receiver and the time of flight (TOF) is used to develop a distance map of the objects in the scene.

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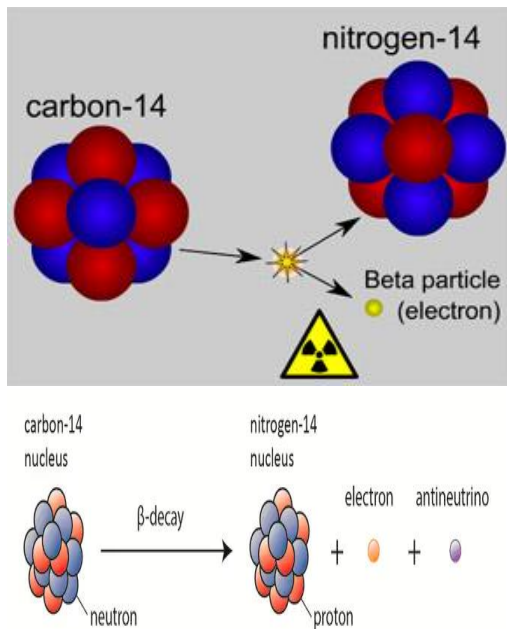
Carbon 14

New radiocarbon (Carbon14) and optically stimulated luminescence ages have confirmed the controversial antiquity of the ancient human footprints discovered in



White Sands National Park, and reported in a study in 2021.

Carbon-14, the longest-lived radioactive isotope of carbon, whose decay allows the accurate dating of archaeological artifacts. The carbon-14 nucleus has six protons and eight neutrons, for an atomic mass of 14.



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White Sands National Park

White Sands National Park is an American national park located in the state of New Mexico and completely surrounded by the White Sands Missile Range.

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Malaria vaccine

A malaria vaccine R21/MatrixM developed by the University of Oxford, manufactured by the Pune-based Serum Institute of India and tested in a phase-3 trial at five sites in

four countries Mali, Burkina Faso, Kenya, and Tanzania in Africa was recommended (but yet to be pre-qualified) by the WHO on October 2.

Three countries Nigeria, Ghana, and Burkina Faso have already approved the use of the vaccine to immunize children aged less than 36 months.

War against malaria gets a shot in the arm
Three countries — Nigeria, Ghana, and Burkina Faso — have already approved the vaccine for children aged less than 36 months

- A phase-3 trial in 4,800 children was conducted at five sites in four countries with different malaria transmission intensities and seasonality
- The participants received three vaccine doses four weeks apart, and a booster shot at the end of 12 months after the last dose
- Primary vaccination was carried out prior to malaria season where it is seasonal or at any time of year in countries where malaria is perennial
- Vaccine efficacy at the end of one year in children aged 5-36 months was 75% where malaria is seasonal and 68% when malaria is perennial
- In children aged 5-17 months, who are more likely to die due to severe malaria, the vaccine efficacy was higher — 79% where malaria is seasonal and 75% where malaria is perennial
- In children aged 18-36 months, vaccine efficacy was 73% where malaria is seasonal and 63% when malaria is perennial
- The vaccine efficacy was well maintained to 18 months with a single booster dose given 12 months after the primary series

Humongous: In 2021, there were 247 million malaria cases worldwide and 619,000 deaths

Malaria

Malaria is caused by a protozoan parasite named Plasmodium, and it is spread by the Anopheles (female) mosquito that causes acute life-threatening disease.

It is a major worldwide health concern where immunocompromised persons, children, and pregnant women have the highest morbidity and mortality rates.

Types, Causes, Symptoms, Risk, Complications, Diagnosis and Prevention

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Plastic pollution

It was in 1907 that the Belgian scientist Leo Baekeland synthesized the first plastic using formaldehyde and phenol, called it

Current Affairs 8th October 2023 by Saurabh Pandey

Bakelite, mass produced it and marketed it. The UN Environment Programme (UNEP) points out that every day, the equivalent of 2,000 garbage trucks full of plastic are dumped into the world's oceans, rivers, and lakes. Plastic pollution is a global problem. Every year, 19-23 million tonnes of plastic waste leaks into aquatic ecosystems, polluting lakes, rivers and seas.

Plastic pollution can alter habitats and natural processes, reducing ecosystems' ability to adapt to climate change, directly affecting millions of people's livelihoods, food production capabilities and social well-being.

The UNEP points out that the environmental, social, economic and health risks of plastics need to be assessed alongside other environmental stressors, like climate change.

Recycling of plastics is a method for production of the vital resource of liquid and gaseous fuels.

Thermal and catalytic degradation, and gasification are alternative methods for recycling of plastic waste to produce fuel having properties similar to commercial fuels.

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Umami as sixth taste

Japanese scientist Kikunae Ikeda first proposed umami as a basic taste in addition to sweet, sour, salty and bitter in the early 1900s.

About eight decades later, the scientific community officially agreed with him.

Now, scientists have evidence of a sixth basic taste.

In a study published recently, researchers have found that the tongue responds to ammonium chloride through the same protein receptor that signals sour taste.

Scientists have for decades recognized that the tongue responds strongly to ammonium chloride.

That protein, called OTO1, sits within cell membranes and forms a channel for hydrogen ions moving into the cell.

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