



FDA Approves First Alzheimer's Drug to Slow Cognitive Decline

January 2023



Leqembi (lecanemab) was approved by the FDA in an accelerated process. This antibody therapy targeted directly at Amyloid plaques was the first treatment to show that plaques can be removed from the brain and that clinical progression slowed in early Alzheimer patients.

Mice with two dads have been created using CRISPR

February 2023

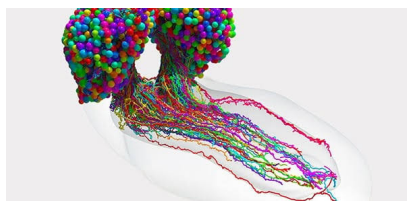
Japanese scientists have successfully produced mice with two biological fathers, in a huge leap in animal reproduction. They did this by removing the nucleus from skin cells of male mice, reprogramming them into stem cells, and rearranging the chromosomes to create viable eggs, which heralds new possibilities for reproductive medicine. The technique could also be used to treat severe cases



of infertile women, such as those with Turner's syndrome, in which one copy of the X chromosome is missing or partially missing, Hayashi said and was the main reason for the research.

Scientists complete First Map of an Insect Brain

March 2023



The international team led by Johns Hopkins University and the University of Cambridge produced a breathtakingly detailed diagram tracing every neural connection in the brain of a larval fruit fly, an archetypal scientific model with brains comparable to humans.

They published the first complete physical map of an insect's brain wiring (a fruit fly larva). Mapping all 3,016 neurons and 548,000 synapses took 12 years, providing biologists with an unprecedented blueprint of how a brain processes information and translates it into behavior.

Ghana is the first country to approve Oxford malaria vaccine

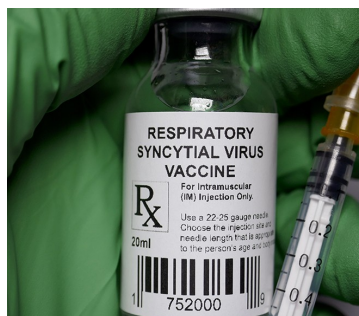
April 2023

The R21/Matrix-M malaria vaccine, developed by Oxford University, was the first vaccine to be approved in Ghana. In trials, the invention proved to be up to 80 percent effective, providing a more effective, affordable tool against one of the world's most deadly infectious diseases. The R21/Matrix-M vaccine is the first to meet the World Health Organization's ambition of more than 75% efficacy levels and has been approved for children aged 5-36 months, the age group most vulnerable to malaria death



FDA Approves First Respiratory Syncytial Virus (RSV) Vaccine

May 2023

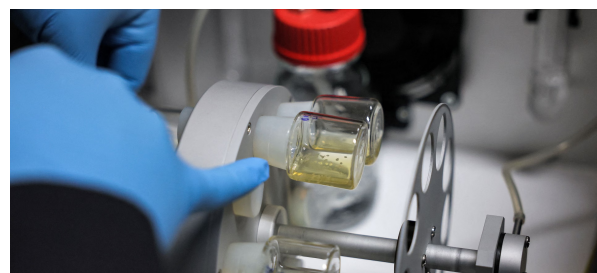


RSV is a little known but highly contagious upper respiratory disease that can be very dangerous for older patients, as well as in the pediatric space. RSV is seasonal, but places a unique strain on hospitals, particularly in the context of the on-going annual influenza seasons and the COVID-19 pandemic. In a historic move after half a century of research, the FDA has approved the first-ever vaccine for the respiratory syncytial virus (RSV). Based on a GSK invention in structural biology, this helps older people to prevent worsening respiratory disease.

Synthetic Human Embryos Created from Stem Cells

June 2023

Human stem cells (no egg or sperm involved) have been used by researchers to create "embryo models". These models do not progress to a human, but they do simulate the earliest stages of development, which can help scientists determine the causes of birth defects and miscarriages.



Asp Caterpillar Venom Blueprint for Nanoscale Drug Delivery

July 2023



The researchers at the University of Queensland found that the venom of the asp caterpillar, which acts like bacterial toxins, can be used for targeted drug delivery, because it is able to perforate cells. The finding could lead to new drugs and treatment methods in the fight against cancer. Unlike other insect venoms, the venom of the asp caterpillar contains toxins that are similar to those produced by disease-causing bacteria such as *E. coli* and *Salmonella*.

Researchers assemble the first complete sequence of a human Y chromosome

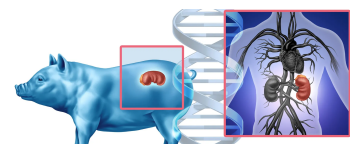
August 2023

The chromosome associated with male development, which is the last mysterious piece of the human genome, has been fully sequenced by a team of more than 100 researchers around the world, including Johns Hopkins University scientists. The achievement completes the Y chromosome's genetic code and unveils key details that could provide a crisper picture of the role the chromosome plays in male-specific development, fertility, and genetically triggered diseases like cancer.

Two-Month Study of Pig Kidney Xenotransplantation Gives New Hope to the Future of the Organ Supply

September 2023

Procedure conducted by Harvard Medical School physician-scientists at Massachusetts General Hospital raises hopes about improving and saving lives amid human organ shortages and reducing health disparities associated with organ failure and transplantation. The pig kidney provided by biotech company co-founded by HMS scientists, was genetically edited to make it more compatible with humans and reduce chance of infection. Longer-term results of the



first-of-its-kind transplant, conducted under an FDA compassionate-use protocol, are not yet clear.

Katalin Karikó and Drew Weissman were jointly awarded the 2023 Nobel Prize in Physiology or Medicine for their discoveries concerning nucleoside base modifications that enabled the development of effective mRNA (messenger ribonucleic acid) vaccines against COVID-19.

FDA Approves First CRISPR Gene-Editing Therapy November 2023

Sickle cell disease (SCD) is a hereditary hemoglobinopathy resulting from a β -globin chain mutation that causes abnormal hemoglobin (HbS) polymerization and leads to severe complications. Current treatment options primarily focus on symptom management, with limited curative potential. Casgevy, the first CRISPR/Cas9-based gene therapy for SCD, has received breakthrough FDA approval.

The UK became the first country in the world to authorize Casgevy. This landmark invention uses CRISPR-Cas9 molecular scissors to permanently edit the DNA inside a patient's blood stem cells, effectively curing the debilitating pain of sickle cell disease.

Biodiversity Discoveries

December 2023

In 2023, scientists documented hundreds of new species, highlighting the planet's vast but highly threatened biodiversity. Notable discoveries included an electric-blue tarantula in Thailand, six thumb-sized chameleons and a silent reed frog in Tanzania, a Peruvian snake named after Harrison Ford, and two pygmy squid from Japan.

Other unique finds were an Australian spider named after Marvel's Venom, a leaf-tailed gecko from Madagascar, and a "snug" (semi-slug) from Borneo.

However, researchers warn that while less than 20% of Earth's species are formally known to Western science, many of these newly named plants and animals are immediately classified as vulnerable or endangered due to rapid habitat



loss, climate change, and human activities like mining and logging.

Report by Rithu Reshma. S