

Mice With Human Brain Cells Born

New creation was added to the strange scientific menagerie where animal species are being mixed together in ever more exotic combinations, AP said.

Scientists announced that they had created mice with small amounts of human brain cells in an effort to make realistic models of neurological disorders such as Parkinson's disease.

Led by Fred Gage of the Salk Institute in San Diego, the researchers created the mice by injecting about 100,000 human embryonic stem cells per mouse into the brains of 14-day-old rodent embryos.

Those mice were each born with about 0.1 percent of human cells in each of their heads, a trace amount that doesn't remotely come close to "humanizing" the

rodents.

"This illustrates that injecting human stem cells into mouse brains doesn't restructure the brain," Gage said. Still, the work adds to the growing ethical concerns of mixing human and animal cells when it comes to stem cell and cloning research. After all, mice are 97.5 percent genetically identical to humans.

Researchers are nevertheless beginning to bump up against what bioethicists call the "yuck factor."

Three top cloning researchers, for instance, have applied for a patent that contemplates fusing a complete set of human DNA into animal eggs in order to manufacture human embryonic stem cells.

Researchers argue that co-mingling human and animal tissue is vital to ensuring that experimental drugs

and new tissue replacement therapies are safe for people.

Others have performed similar experiments with rabbit and chicken eggs while University of California-Irvine researchers have reported making paralyzed rodents walk after injecting them with human nerve cells.

Doctors have transplanted pig valves into human hearts for years, and scientists have injected human cells into lab animals for even longer. But the brain poses an additional level of concern because some envision nightmare scenarios in which a human mind might be trapped in an animal head.

The results suggest that human embryonic stem cells, once injected into people, will mature into the cells that

surround them. No known human has ever received an injection of embryonic stem cells because so little is known about how those cells will mature once inside the body.

Human embryonic stem cells are created in the first days after conception and give rise to all the organs and tissues in the human body. Scientists hope they can someday use stem cells to replace diseased tissue. But many social conservatives, including President Bush, oppose the work because embryos are destroyed during research.

Stem cell researchers argue that mixing human and animal cells is the only way to advance the field because it's far too risky to experiment on people; so little is known about stem cells.

Happiness in Old Age Depends on Attitude

Happiness in old age may have more to do with attitude than actual health, a new study suggests.

According to LiveScience, researchers examined 500 Americans age 60 to 98 who live independently and had dealt with cancer, heart disease, diabetes, mental health conditions or a range of other problems. The participants rated their own degree of successful aging on scale of 1-10, with 10 being best.

Despite their ills, the average rating was 8.4.

"What is most interesting about this study is that people who think they are aging well are not necessarily the (healthiest) individuals," said lead researcher Dilip Jeste of the University of California at San Diego.

"In fact, optimism and effective coping styles were found to be more important to successfully aging than traditional measures of health and wellness," Jeste said.

"These findings suggest that physical health is not the best indicator of successful aging—attitude is."

The finding may prove important for the medical community, which by traditional measures would have considered only 10 percent of the study members to be aging successfully.

Health and happiness may indeed be largely in the mind. A study released last year found that people who described themselves as highly optimistic a decade ago had lower rates of death from cardiovascular disease and lower overall death rates than strong pessimists. Research earlier this year revealed that the sick and disabled are often as happy as anyone else.

The new study also showed that people who spent time each day socializing, reading or participating in other hobbies rated their aging satisfaction higher.

"For most people, worries about their future aging involve fear of physical infirmity, disease or disability," Jeste said. "However, this study is encouraging because it shows that the best predictors of successful aging are well within an individual's control."

New Object Found at Edge of Solar System

Researchers have found a large object beyond Pluto traveling in an orbit tilted by 47 degrees to most other objects in the solar system.

According to New Scientist, astronomers are at a loss to explain why the object's orbit is so off-kilter while being almost circular.

Researchers led by Lynne Allen at the University of British Columbia in Vancouver, Canada, first spotted the object in observations made with the Canada-France-Hawaii Telescope in December 2004. Since October 2005, they have made follow-up observations that have revealed the

object's perplexing path. Tentatively named 2004 XR190, the object appears to have a diameter of between 500 and 1000 kilometres, making it somewhere between a fifth and nearly half as wide as Pluto.

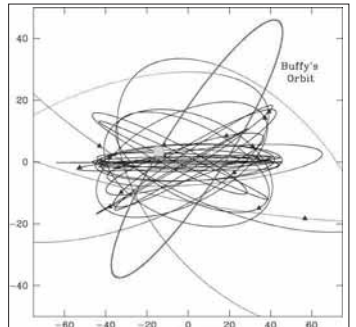
It lies in a vast ring of icy bodies beyond Neptune called the Kuiper Belt, most of which orbit in nearly the same plane as Earth.

But at 47 degrees, 2004 XR190's orbit is one of the most tilted, or inclined, Kuiper Belt Objects known. That suggests it was flung out of the solar system's main disc after a close encounter with another object—such as Neptune or perhaps a star that

passed by the Sun billions of years ago.

Neptune has been blamed for scattering many other KBOs into tilted paths. But these tend to show other signs of a past interaction with the giant planet, such as moving in elliptical paths and having one part of their orbit pass near Neptune's at 30 astronomical units (AU) from the Sun (1 AU is the distance between the Earth and the Sun).

2004 XR190, however, follows a nearly circular path. And it is too distant to have come into direct contact with Neptune, travelling between 52 and 62 AU from the Sun. Its orbit is also too circular—and too small—to have been



"Buffy" is one of the most tilted, or inclined, Kuiper Belt Objects.

tilted by a passing star, says Allen. These traits make the object, nicknamed "Buffy" after the US television series about a vampire slayer, hard to explain.

Diabetes Linked to Cancer Risk

The factors that lead to diabetes may also put a person at increased risk of pancreatic cancer, research suggests.

According to BBC News website, the US National Cancer Institute found high insulin levels and increased resistance to the hormone were associated with a higher cancer risk.

They say their findings suggest adopting a healthy diet and lifestyle may help to reduce the risk of pancreatic cancer.

The findings confirm previous studies which have linked type 2 diabetes

to pancreatic cancer.

The researchers say it is possible that insulin in higher than normal levels may trigger the growth of pancreatic cancer cells.

The early stages of type 2 diabetes are often associated with raised levels of the hormone.

The researchers reviewed data on 29,133 male smokers from Finland, who were followed for up to 16 years.

They found those people with the highest concentrations of glucose and insulin and the highest levels of insulin resistance were more at risk of pan-

creatic cancer.

The researchers say follow-up studies are required to confirm the findings.

But writing in the journal, they say, "Lifestyle changes to decrease glucose and insulin concentrations through weight reduction, increasing physical activity, and diet such as decreasing saturated fat intake, and identification of other modifiable factors that may contribute to higher glucose and insulin concentrations could possibly impact pancreatic cancer development, as well as other cancer and chronic disease."

Robosnail Can Climb Walls

A robotic snail that can climb smooth vertical walls and traverse ceilings has oozed into action.

According to nature.com, the mechanical mollusc was developed by a team of engineers at the Massachusetts Institute of Technology, led by Annette Hosoi.

They built the robot to test out mathematical models of how snails move and stay stuck to surfaces, but they also hope that robotic snails might one day find a use in the real world.

Land snails generally get around by contracting their single foot, which sits on top of a bed of sticky slime. A region of compressed muscle travels from the back of the snail's foot towards the front, while the snail's attachment to the surface stops it from sliding backwards.

When the compression reaches the very front of the foot it is released, allowing the snail to stretch out to its full length, slightly

ahead of its original position. This allows the animal to inch forwards.

To loosely imitate this process, the artificial gastropod has five movable segments lined up on its underside. One by one, each of these sections moves forwards along a track on the robot's body. After all five have advanced, the body itself slides forward, returning the segments to their original positions.

The team tested out their snail on a tilting platform, covered with a 1.5-millimetre-thick layer of slime made from Laponite, a type of clay that forms a clear, sticky gel when mixed with water.

As the engineers increased the incline, they saw that the snail took the hill in its stride, continuing to plod along even when the surface was vertical. When the platform was flipped over so that the robot was upside down, it still made steady progress.

The secret to this gravity-defying stunt is apparently to keep the snail as light as possible (just 31.6 grams), while ensuring that the Laponite has just the right stickiness.

So has the world been crying out for a robotic snail? "One can easily argue that snail locomotion is slow, slimy and inefficient," admit the researchers in their paper. But they also point out that because gastropods have only one foot, it is much easier to build mechanical analogues of snails than of two-footed people or four-footed animals.

And although they are slow, snails can crawl over pretty much anything, making them extremely versatile at getting around different environments.

The group has now developed mathematical models to come up with the optimum weight and slime characteristics for a robotic snail. Hosoi says that these should help to build a second generation of robosnails that are much faster and more manoeuvrable.

Protein Controls Embryonic Organ Growth

Scientists at St. Jude Children's Research Hospital say they've found a protein called Scyt6 that controls normal development of one's lungs, kidney and brain.

According to Science Daily, the researchers at the Memphis hospital say Scyt6 determines which cells live and which die during the growth and development of the mammalian embryo.

The St. Jude study is the first to show Scyt6 plays a critical role during development of mammals by selectively regulating when and where specific cells either proliferate or undergo apoptosis.

Understanding exactly how Scyt6 balances apoptosis with cell proliferation could provide significant insights into how organs develop in the growing embryo, the scientists said.

Auroras similar to Earth's Northern Lights appear to be common on Mars, according to physicists at the University of California, Berkeley, who have analyzed six years' worth of data from the Mars Global Surveyor.

According to PhysicsWeb, the discovery of hundreds of auroras over the past six years comes as a surprise, since Mars does not have the global magnetic field that on Earth is the source of the aurora borealis and the antipodal aurora australis.

According to the physicists, the auroras on Mars aren't due to a planet-wide magnetic field, but instead are associated with patches of strong magnetic field in the crust, primarily in the southern hemisphere. And they probably aren't as colorful either, the researchers say: The energetic electrons that interact with molecules in the atmosphere to produce the

glow probably generate only ultraviolet light—not the reds, greens and blues of Earth.

"The fact that we see auroras as often as we do is amazing," said UC Berkeley physicist David A. Brain, the lead author of a paper on the discovery recently accepted by the journal Geophysical Research Letters. "The discovery of auroras on Mars teaches us something about how and why they happen elsewhere in the solar system, including on Jupiter, Saturn, Uranus and Neptune."

Last year, the European spacecraft Mars Express first detected a flash of ultraviolet light on the night side of Mars and an international team of astronomers identified it as an aurora.

Upon hearing of the discovery, UC Berkeley researchers turned to data from the Mars Global Surveyor to see if an on-board UC Berkeley instrument package—a magnetometer-electron reflectometer—had detected other

Hundreds of Auroras Detected on Mars

evidence of auroras.

The spacecraft has been orbiting Mars since September 1997 and since 1999 has been mapping from an altitude of 400 kilometers (250 miles) the Martian surface and Mars' magnetic fields. It sits in a polar orbit that keeps it always at 2 a.m. when on the night side of the planet.

Within an hour of first delving into the data, Brain and Halekas discovered evidence of an auroral flash—a peak in the electron energy spectrum identical to the peaks seen in spectra of Earth's atmosphere during an aurora.

Since then, they have reviewed more than 6 million recordings by the electron reflectometer and found amid the data some 13,000 signals with an electron peak indicative of an aurora. According to Brain, this may represent hundreds of night-side auroral events like the flash seen by the Mars Express.

When the two phys-

cists pinpointed the position of each observation, the auroras coincided precisely with the margins of the magnetized areas on the Martian surface.

The same team, led by co-authors Mario H. Acu?a of NASA's

Goddard Space Flight Center and Robert Lin, UC Berkeley professor of physics and director of the Space Sciences Laboratory, has extensively mapped these surface magnetic fields

using the magnetometer/reflectometer aboard the Mars Global Surveyor.

Just as Earth's auroras occur where the magnetic field lines dive into the surface at the north and south poles, Mars'

auroras occur at the borders of magnetized areas where the field lines arc vertically into the crust.

Of the 13,000 auroral observations so far, the largest seem to coincide with increased solar wind activity.

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