Children of Centenarians

A study shows that the offspring of individuals who make it to 100 are less likely to develop heart disease and generally live longer.

News in Brief

Scientists Eye Made-to-Order Bones

Japanese hospitals are running a clinical trial on the world's first custom-made bones which would fit neatly into patients' skulls and eventually give way to real bones.

According to AFP, if successful, the Japanese method could open the way for doctors to create new bones within hours of an accident so long as the patient has electronic data on file.

Doctors usually mend defective bones by transplanting real bones or ceramic substitutes. The Japanese implants use a powder of calcium phosphate, the substance that makes up real bones.

The new implants are called CT Bone as they are crafted using the patient's computer tomography (CT) data, a form of medical imaging.

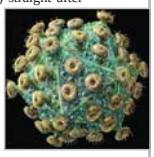
It can match the complicated structures of the jaw, cheek and other parts of the skull down to one millimeter (0.039 of an inch), a level significant enough to make a difference in human faces, researchers said.

Rapid Care Cuts Baby's HIV Risk

Rapid drug treatment of babies with HIV dramatically cuts their risk of death and debilitating disease, international research shows.

The study prompted the World Health Organization to change its guidelines, which had recommended delaying therapy until symptoms became apparent, BBC said.

It found giving antiretroviral therapy (ART) straight after diagnosis cut the risk of death from AIDS by 76 percent.



The study appears in the New England Journal of Medicine.

The study, of 377 HIV-positive South African babies, found that babies given treatment immediately after they were diagnosed with HIV cut their risk of dying from the infection to just 4 percent.

In comparison, the risk of death for those whose treatment was delayed until their levels of key immune system CD4 cells began to fall, or other symptoms emerged, was 16 percent.

Immediate treatment also cut the chance of disease progressing measurably by 75 percent, from 26 percent to 6 percent.

The findings were so conclusive that treatment for all babies was reassessed at the preliminary stage of the trial.

Electronics With a Twist

They've made electronics that can bend. They've made electronics that can stretch.

And now, they've reached the ultimate goal--electronics that can be subjected to any complex deformation, including twisting.

Yonggang Huang, Joseph Cummings Professor of Civil and Environmental Engineering and Mechanical Engineering at Northwestern University's McCormick School of Engineering and Applied Science, and John Rogers, the Flory-Founder Chair Professor of Materials Science and Engineering at the University of Illinois at Urbana-Champaign, have improved their so-called 'pop-up' technology to create circuits that can be twisted.

Such electronics could be used in places where flat, unbending electronics would fail, like on the human body, ScienceDaily reported.

Electronic components historically have been flat and unbendable because silicon, the principal component of all electronics, is brittle and inflexible. Any significant bending or stretching renders an electronic device useless.

How Cockroaches Escape

When cockroaches flee their predators, they choose, seemingly at random, amongst one of a handful of preferred escape routes, according to a new report.

"By using one of a number of possible trajectories, we think that cockroaches may behave with sufficient unpredictability to avoid the possibility that predators will learn their escape strategy," said Paolo Domenici of CNR-IAMC in Italy. "As we say in our report, the predator is made to guess."

Cockroaches have been studied for many years as a model for understanding animal escape responses, he was quoted as saying by ScienceDaily.

While much is known about the neural circuitry underlying their behavior, it still seemed to Domenici's team that open questions remained regarding their strategy.

The insects don't run away in random directions, but did not seem to flee in an easily predictable manner either. In the new study, the researchers searched for some pattern by repeatedly testing cockroaches as they escaped from threats.

What they found is that cockroaches select one of a number of preferred trajectories. Their choice is not completely random because the angle at which the bugs are stimulated to run seems to limit the options.

However, when they are startled from certain directions--head on, for example--cockroaches flee along four primary escape routes at fixed angles from the threat.

Light-Wave Implant For the Deaf

An implant, which works by firing infrared light into the inner ear, is being investigated by US researchers.

According to BBC, nerves in the ear can be stimulated by light as well as sound and the team from Northwestern University, Illinois, is aiming to harness this.

Infrared light shone onto guinea pig nerve cells produced better results than standard cochlear implants, a report in New Scientist magazine said.

But UK charity RNID said a device for human use might take years to develop.

For some profoundly deaf patients, the development of cochlear implants in recent years has been an important change.

The system works by placing approximately 20 electrodes to directly stimulate the nerves in the inner ear, but it has its limitations, with users finding it hard to appreciate music or communicate in a noisy environment.

This is because there are as many as 3,000 "hair cells" in a healthy ear, contributing to a far more detailed interpretation of sound than the implant can provide.

Dr. Claus-Peter Richter from Northwestern believes that an effect discovered by chance could hold the key to a better implant.

Surgeons who used lasers to perform a surgical procedure in the ear discovered that they were able to stimulate the nerve cells there to send an electrical message back to the brain.

Exactly why this happens is unclear, although Dr. Richter believes that the heat that accompanies the light may be responsible.

Rare Penguin Species Rediscovered

Researchers studying a rare and endangered species of penguin have uncovered a previously unknown species that disappeared about 500 years ago.

The research suggests that the first humans in New Zealand hunted the newly found Waitaha penguin to extinction by 1500, about 250 years after their arrival on the islands, AP reported.

But the loss of the Waitaha allowed another kind of penguin to thrive--the yellow-eyed species that now also faces extinction, Philip Seddon of Otago University, a co-author of the study, said.

The team was testing DNA from the bones of prehistoric modern yellow-eyed penguins for genetic changes associated with human settlement when it found some bones that were older--and had different DNA.

Tests on the older bones "lead us to describe a new penguin species that became extinct only a few hundred years ago," the team reported in a paper in the biological research journal Proceedings of the Royal Society B: Biological Sciences.

Polynesian settlers came to New Zealand around 1250 and are known to have hunted species such as the large, flightless moa bird to extinction.

2nd C-Section Under Hypnosis

Iranian obstetricians have performed the country's second Cesarean section without anesthesia by using hypnotherapy.

"The patient was subjected to hypnotherapy upon entering the operation room and was ready to have the C-section after 30 minutes," said obstetrician Roya Khodai.

According to Khodai, the C-section took about half an hour and the baby was born without any notable complications.

She added that the patient's vitals were under control throughout the operation and an anesthesiologist was present in case of unexpected complications, Presstv reported.

Khodai said the only complication during the operation was blood loss which was immediately brought under control.

Both mother and baby are in a good health.

"Hypnosis is an effective alternative for individuals undergoing minor surgeries (C-section is considered a major operation) and ideal for overcoming anesthesia-related complications.

Hypnotherapy is also claimed to be successful in helping individuals deal with a variety of emotional and personal problems such as smoking, overeating and bed-wetting in children.

It is also being used to help women experience a pain-free labor without the use of medication or drugs.

New Technology to Eradicate Malaria

> Compiled by Sarvin Alidaee

Emerging technologies could boost supplies of essential plant-based drugs to combat and ultimately help eradicate malaria, says a report.

In the face of increasing parasite resistance to anti-malarial drugs, there is now great reliance on artemisinin combination therapies (ACT) to treat malaria, BBC reported.

But ACTs are expensive and demand threatens to outstrip supply.

Plant breeding, new drugs and clever ways to make artemisinin in the lab are the answer, according to world experts.

The report is based on the conclusions of the Artemisinin Enterprise Conference 2008, which was sponsored by the Bill and Melinda Gates Foundation and the Roll Back Malaria Partnership and hosted by the University of York.

It assesses a portfolio of new technologies, collectively known as the Artemisinin Enterprise.

> Rising Demand

Around 100 million ACTs were sold in 2006, but forecasters say that demand will at least double over the next four years, potentially growing to over 300 million doses annually.

This is partly due to a recent decision by the global malaria community to subsidize the cost of ACTs.

There is already expected to be a shortage in 2010 owing to a lack of the Artemisia annua wormwood plant, the raw material for ACTs, being grown.

Malaria experts say three emerging technologies have the potential to fill this gap.

The Center for Novel Agricultural Products at the University of York is using fast-track plant breeding to create crops that produce higher yields of artemisinin. It has decided against using GM crops because of time delay that would be incurred to overcome the associated regulatory hurdles.

The non-profit organization Medicines for Malaria Venture is developing synthetic artemisinin-like drugs. These experimental drugs have been shown to cure malaria in mice in just one dose.

Clinical trials in humans will begin in February or March 2009.

> Infectious Disease

Malaria is a vector-borne infectious disease caused by protozoan parasites. It is widespread in tropical and subtropical regions, including parts of the Americas, Asia, and Africa.

Each year, there are approximately 515 million cases of malaria, killing between one and three million people, the majority of whom are young children in Sub-Saharan Africa.

In fact, 90 percent of malaria-related deaths occur in Sub-Saharan Africa, Wikipedia said.

> Transmission

Usually, people get malaria by being bitten by an infective female Anopheles mosquito. Only Anopheles mosquitoes can transmit malaria and they must have been infected through a previous blood meal taken on an infected person. When a mosquito bites an infected person, a small amount of blood is taken which contains microscopic malaria parasites. About 1 week later, when the mosquito takes its next blood meal, these parasites mix with the mosquito's saliva and are injected into the person being bitten.

The parasites multiply within red blood cells, causing symptoms that include symptoms of anemia (light headedness, shortness of breath, tachycardia, etc.), as well as other general symptoms such as fever, chills, nausea, flu-like illness, and, in severe cases, coma and death.

Malaria transmission can be reduced by preventing mosquito bites with mosquito nets and insect repellents, or by mosquito control measures such as spraying insecticides inside houses and draining standing water where mosquitoes lay their eggs.

> Socioeconomic Impact

Malaria causes an average loss of 1.3 percent annual economic growth in countries with intense transmission. When compounded over the years, this loss has led to substantial differences in GDP between countries with and without malaria, WHO wrote.

The disease traps families and communities in a downward spiral of poverty, disproportionately affecting marginalized populations and poor people who cannot afford treatment or who have limited access to healthcare.

Its direct costs include a combination of personal and public expenditures on both prevention and treatment of disease. In some countries with a very heavy malaria burden, the disease may account for as much as 40 percent of public health expenditure, 30-50 percent of inpatient admissions and up to 60 percent of outpatient visits.

Malaria has lifelong effects through increased poverty, impaired learning and decreases attendance in schools and the workplace.