

News in Brief

Short Arms, Legs

Linked to Dementia Risk

Having short arms and legs may raise a person's risk of developing memory problems later in life, US researchers said.

They said women with the shortest arm spans were 50 percent more likely to develop dementia and Alzheimer's disease than women with longer arm spans. And the longer a woman's leg from floor to knee, the lower her risk for dementia, Reuters reported.

In men, only a shorter arm span was linked with higher dementia risk, according to the study, which was published in the journal *Neurology*.

The researchers said several studies have suggested that early life environment plays a role in susceptibility to chronic disease in later life. Short limbs may be a sign of nutritional deficits early in life that ultimately play a role in brain development.

"Body measures such as knee height and arm span are often used as biological indicators of early life deficits, such as a lack of nutrients," said Tina Huang of Tufts University in Boston, who led the study.

Electric Signals

Could Ward Off Sharks

While the menacing fin of a shark has figured in many human nightmares, people may be the stuff of shark nightmares.

In addition to intentionally hunting sharks for food, fishermen often catch them inadvertently. A new plan hopes to reduce this bycatch by repelling sharks with electric fields, LiveScience wrote.

Sharks have an innate ability to detect electric fields, useful for sensing the bioelectric activity of their prey. Researchers discovered that strong electric fields could repel these predators, most likely by overwhelming their electricity sensors.

"It's a sense we don't have," said Richard Brill, a biologist at the National Oceanographic and Atmospheric Association (NOAA)'s Northeast Fisheries Science Center and head of the Cooperative Marine Education and Research Program at the Virginia Institute of Marine Science. "The closest [analogy] I can come up with is if you get exposed to a bright light, you squint and look away."

A recent test showed that small disks of a rare metal alloy called palladium neodymium interact with the salt in seawater to produce electric fields strong enough to ward off sharks.

Boosting Mussel Power

Researchers in Korea report development of a way to double production of a sticky protein from marine mussels destined for use as an antibacterial coating to prevent life-threatening infections in medical implants.

The coating, produced by genetically-engineered bacteria, could cut medical costs and improve implant safety, the researchers say, Physorg reported.

Bacterial infection of medical implants, such as cardiac stents and dialysis tubing, threatens thousands of people each year and is a major medical challenge due to the emergence of antibiotic-resistant bacteria. Several research groups are working on long-lasting, germ-fighting coatings from mussel proteins, but production of these coatings is inefficient and expensive.

Hyung Joon Cha and colleagues previously developed a way to use genetically engineered *E. coli* bacteria to produce mussel adhesive proteins. Now they report adding a new gene for producing Vitreoscilla hemoglobin (VHb), a substance that boosts production of proteins under low-oxygen conditions.

Adding the VHb gene to the engineered *E. coli* doubled the amount of mussel proteins produced, which could lead to more cost-effective coatings, the researchers say.

Did Earth Once

Have Multiple Moons?

The ancient catastrophe that gave birth to the Moon may have produced additional satellites that lingered in Earth's skies for tens of millions of years.

According to *NewScientist*, a new model suggests moonlets may have once occupied the two Earth-Moon Lagrangian points, regions in space where the gravitational tug of the Earth and the Moon exactly cancel each other out. Objects trapped in these points are called Trojans and can remain stationary forever if left undisturbed.

Scientists think the Moon was created when Earth was struck by a Mars-sized object some 4.5 billion years ago.

"The giant impact that likely led to the formation of the Moon launched a lot of material into Earth orbit, and some could well have been caught in the Lagrangian points," says study team member Jack Lissauer of NASA Ames Research Center in California, US. Once captured, the Trojan satellites likely remained in their orbits for up to 100 million years, Lissauer and co-author John Chambers of the Carnegie Institution of Washington say.

Want Happier Retirement? Keep Working

People over 65 but still working feel better than those who have retired, new research shows.

Initial results from the Health, Work and Retirement Longitudinal Study, carried out by researchers at Massey University's School of Psychology, have been released. The study collates information gathered from 6662 people aged between 55 and 70 regarding their transition from work to retirement and how it affects their health, Physorg said.

Researcher Dr. Fiona Alpass says data collected from the first questionnaire indicates those still employed past the age of 65 rate their own mental health higher than those who have stopped working.

"But we don't know yet whether retirement leads to poor mental health or whether poor mental health leads to early retirement. I suspect it is a combination of both, but the data from upcoming questionnaires is needed to confirm that."

Unease about their financial situation once retired was also a concern. "Almost half of our working respondents thought their living standards would decline in retirement. However, it must be noted that a large percentage thought they would stay the same."

She says most participants were also concerned about future economic trends and the effect they may have on retirement living standards.

Needle-Free Device Delivers Pain-Free Analgesia

A new needle-free device that delivers a local anesthetic to the skin promises to help make delivering drugs and drawing blood less painful for children.

The system involves a sterile, prefilled, disposable device that dispenses lidocaine powder into the epidermis, the cells that make up the outer layer of the skin, lead author Dr. William T. Kempsey, from the University of Connecticut School of Medicine and Connecticut Children's Medical Center in Hartford, and colleagues explain, Reuters said.

In the study, investigators randomly assigned a group of children to the powder lidocaine system or to a sham placebo system 1 to 3 minutes before a procedure known as venipuncture, during which a small needle is inserted into a vein in the back of the hand to collect blood, or a procedure called venous cannulation, which is used to drain blood or fluid or administer medications.

The use of the lidocaine system provided rapid and significant analgesia relative to the sham system, based on standard pain scale scores.

Parental ratings of pain were also significantly lower with the lidocaine system, the researchers report in the journal *Pediatrics*.

The study, which involved nearly 600 children, confirms what was seen in smaller studies.

What Makes Food Look Tasty



➤ Ghrelin levels rise and fall before and after meals, suggesting that it causes hunger and encourages eating.

A hormone that makes people eat more works by causing food to look tastier.

This natural molecule, named ghrelin, actually improves perception and memory when it comes to food.

"When you go to the supermarket hungry, every food looks better," said researcher Alain Dagher, a neurologist at McGill University in Montreal. "Now, we've found that it is ghrelin that acts on the brain to make food more appealing."

This hormone is secreted in the gut. Scientists already knew that ghrelin levels rise and fall before and after meals, suggesting that it causes hunger and encourages eating. Prior studies had also shown ghrelin seemed to have widespread effects on the brain as well, LiveScience said.

To find out more about what effects this hormone had on the brain, 20 volunteers were scanned as they looked at images of either food or scenery. Twelve participants received ghrelin injections, while the others were told they were given the hormone but were not.

After infusions of ghrelin, the brains of volunteers responded more strongly to pictures of food. They actually got better at recognizing these images. "People actually see them better," Dagher said.

The hormone also influenced memory. "People remembered the food pictures better when ghrelin was high," Dagher added. This hormonal response makes sense for our species as a whole—it could help starving people

eat food they might not otherwise consider appetizing. In times of plenty, however, ghrelin could help contribute to obesity and related diseases.

"Obesity must be understood as a brain disease," Dagher told LiveScience. "Obese people eat too much, and this is likely due largely to excess hunger."

Therapies that disrupt these effects of ghrelin could help fight obesity, the researchers conjectured. However, such treatments might come with unwanted side effects on mood, since they would target the brain's pleasure centers, Dagher said.

"Many drug companies are currently developing ghrelin-blocking drugs as obesity treatments," Dagher said. "However, we show that ghrelin acts on brain areas involved in emotion and motivation. A drug that suppresses this brain system runs the risk of causing depressed mood. There is a risk of side effects."

The parts of the brain linked to ghrelin are also those involved in drug addiction. "One theory is that addictive drugs act on brain systems designed to control food intake," Dagher said. "Our brains didn't evolve to make us vulnerable to addictive drugs."

Neuroscientist and psychologist Dana Small at the John B. Pierce Laboratory affiliated with Yale University, who did not participate in this study, said these findings suggest it might make sense "to use what we know about drug addiction to understand and treat obesity."