## IN THE NEWS

### Coffee can make women infertile

Caffeine reduces muscle activity in the fallopian tubes that carry eggs from a woman's ovaries to her womb, which can reduce a woman's chance of becoming pregnant. "This finding goes a long way towards explaining why drinking caffeinated drinks can reduce a woman's chance of becoming pregnant," says Sean Ward, who led the study. Ward is professor of physiology and cell biology at the University of Nevada School of Medicine who conducted these experiments on mice. Human eggs are microscopically small, but need to travel to a woman's womb if she is going to have a successful pregnancy, according to a Nevada statement.

Although the process is essential for a successful pregnancy, scientists know little about how eggs move through the muscular Fallopian tubes, reports the British Journal of Pharmacology. It was generally assumed that tiny hair-like projections, called cilia, in the lining of the tubes, waft eggs along assisted by muscle contractions in the tube walls. By studying tubes from mice, Ward and his team discovered that caffeine stops the actions of specialized cells in the wall of the tubes.

*(Source: thehealthsite.com)*

### Researchers build nano-composite boosting electro-chemical capacitors

**TEHRAN (ISNA)** -- Iranian researchers at Qom University and Tehran University have developed a nano-composite which can increase capacitance of electro-chemical capacitors as electrode.

The nano-composite designed in laboratory scale is made of inexpensive material and based on green chemistry principles.

The main goal of the study was to use available material with appropriate price for building electrode to be used in electro-chemical capacitors.

The project introduces a nano-composite which can be easily synthesized and replace expensive material in energy saving systems such as super capacitors, said Ali Ehsani who is the lead author of the study.

Polyaniline conductive polymer which includes little graphene and gold nano-particles were used in the research.

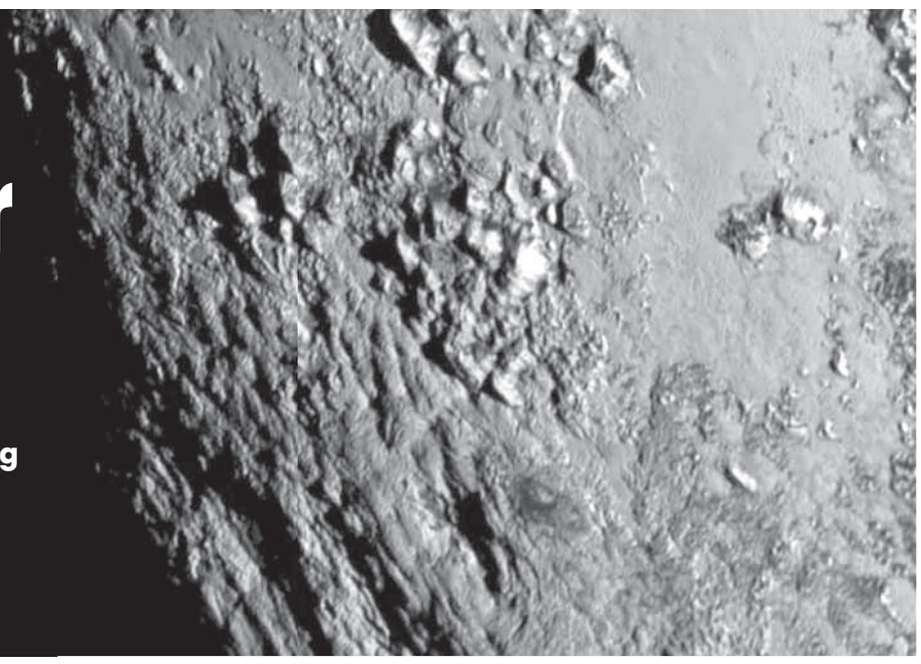
Super capacitors should have appropriate sustainability and repeatability in charging and decharging process, and using little graphene has dramatically boosted graphene's sustainability.

On the other hand, gold nano-particles in graphene structure have increased polymer's conductivity.

The nano-composite can be used for using clean energy systems and saving energy.



# There may be a massive disturber beyond Pluto



**There's a chance that scientists missed out something since there are clues that a tenth planet may be lurking in our galaxy's outer reaches. Planet X may be larger than Pluto and our planet. Sheppard thinks that it may be as big as Neptune.**

After New Horizons probe's historic flyby of planet Pluto on July 14, 2015, NASA plans to get the tiny craft even further. New Horizons is now slated to reach a tiny icy body in the Kuiper belt on New Year's Day, 2019, but scientists believe that beyond that region a hidden planet may be lurking, the famous Planet X.

Scott Sheppard of the Carnegie Institution of Washington explained that the some of the rocky bodies in the Kuiper belt are large enough to be qualified as dwarf planets, but none of the known KBOs (Kuiper Belt Objects) is larger than Pluto.

Yet, there's a chance that scientists missed out something since there are clues that a tenth planet may be lurking in our galaxy's outer reaches. Planet X may be larger than Pluto and our planet. Sheppard thinks that it may be as big as Neptune.

Sheppard and a fellow researcher disclosed the theory in the journal Nature last year. According to the document, there may be a "massive perturber" located beyond the Kuiper Belt. Scientists believe that the mysterious planet is a dwarf planet that is located three times farther from our star than Pluto is. Astronomers based their theory on awkward disruptions in the orbits of several large space objects in the region.

**Remote objects**

Researchers explained that these objects share an identical orbital pattern that is unusual for space objects their size. For instance, all of them come to the periphelion at the ecliptic, and all of them come from bellow the plane. The two scientists wrote that this behavior cannot be random since there seems to be a pattern in how these very remote objects orbit the sun.

And the pattern can only have one explanation – there's a large object with incredible mass that disturbs their orbits. Sheppard called that object the "disturber."

A massive disturber can disturb the objects coming close to it, but it can also gravitationally lock objects into identical orbits. Scientists argued that the phenomenon is common to asteroids that come dangerously close to Earth. Most of them "prefer" certain orbital angles that prevent them from impacting our planet.

Nevertheless, the phenomenon may have another explanation, as well, since the sample of small objects analyzed by Sheppard and his team is quite small – a dozen. So, the team currently tries to extend research and see if their hypothesis is confirmed in the case of other "extreme" KBOs.

*(Source: The Monitor Daily)*

## Dual genetic tests may be best way to diagnose autism

A new Canadian study suggests the use of two newer genetic tests may be used to help better diagnose autism.

Characterized by impaired social, emotional and communications skills, various studies suggest autism affects approximately one per cent of the population. In the U.S., one in 68 children are now being diagnosed with the neurological condition.

The symptoms displayed by those who have the disorder vary, leading to the use of the term autism spectrum disorder, or ASD.

In a study published Tuesday in the Journal of the American Medical Association (JAMA), researchers from Toronto's Hospital for Sick Children found that the use of two diagnostic tests may help identify the genetic mutations potentially linked to ASD.

Doctors have traditionally relied on various standardized tests – including observation of how a child learns – to make an ASD diagnosis. But scientists believe the best confirmation may be in a child's DNA.

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**Signs of dosorder**

The study involved more than 250 unrelated children with a suspected ASD diagnosis, including Melissa Blundon's 12-year-old son, Owen, who showed outward signs of the disorder early in life.

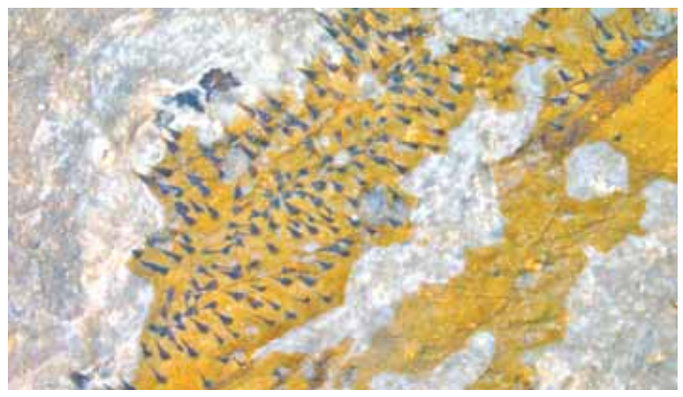
The study found that when used individually, the tests identified ASD in approximately eight per cent of the children. The CMA showed 9.3 per cent of children had genetic mutations that could explain their autism, while the WES found 8.4 percent of children had mutations could explain their disorder.

When the tests were used together, however, twice as many children received a molecular diagnosis.

"Sixteen per cent of the children had an ASD-related genetic finding," said Dr. Bridget Fernandez, with Memorial University of Newfoundland.

*(Source: ctvnews.ca)*

## Researchers find fossils of a huge scorpion-like animal



The world really has its hidden monsters. Newly found fossils show the Earth's first predatory monster which is reportedly 6 feet long, with a dozen arms growing from its head and seemingly venomous spiked tail, according to the new study.

The creature, called Pentecopterus after a kind of ancient Greek warship, was in fossil form, and is 467 million years extinct. In its heyday, it could grow to almost six feet in length, and would have feared nothing.

"Pentecopterus is large and predatory, and eurypterids must have been important predators in these early Palaeozoic ecosystems," James Lamsdell, a Yale University researcher who is the lead author of a study on this species published this week, said in a release from Yale.

Sea scorpions like Pentecopterus have no modern analogue, but are the common ancestor to creatures like lobsters, spiders and ticks. It was an apex predator, with huge limbs used to grab prey beneath the waters of the prehistoric sea that once covered Iowa and much of today's North America.

Lamsdell says the fossils, found in 2010 after the river they were beneath was temporarily dammed, are the oldest example of sea scorpions, known as eurypterids.

"This shows that eurypterids evolved some 10 million years earlier than we thought, and the relationship of the new animal to other eurypterids shows that they must have been very diverse during this early time of their evolution, even though they are very rare in the fossil record," he said.

Though rare, the discovery site included remains of several juvenile and adult examples of the species, many of them in excellent condition within the ancient crater bed.

The "undisturbed, oxygen-poor bottom waters within the meteorite crater led to the fossils' remarkable preservation," the University of Iowa's Huaibao Liu, who led the initial fossil dig, said.

*(Source: Budapest Report)*

## Regeneron scientists discover key to excess bone growth in rare disease

**CHICAGO (Reuters) —** Scientists at U.S. biotechnology company Regeneron Pharmaceuticals researching a rare genetic disease that traps sufferers in a second skeleton have discovered a treatment that shuts down excessive bone growth in mice engineered to develop the illness.

Company scientists said on Wednesday the protein Activin-A, which normally blocks bone growth, triggers hyperactive bone growth in patients with a genetic mutation that causes the disease. The disease is known as Fibrodysplasia Ossificans Progressiva, or FOP.

The researchers showed that an antibody that blocks Activin-A helped shut down the growth signal in genetically modified mice. The effect lasted as long as six weeks, according to the study, published in the journal Science Translational Medicine.

Aris Economides, executive director of skeletal diseases and co-founder of the Regeneron Genetics Center, said the findings could eventually lead to a treatment for the disease. FOP is a lethal genetic disorder in which muscle and soft tissue gradually are replaced by bone, forming an extra skeleton that immobilizes and eventually suffocates patients.


FOP is caused by mutations in the gene ACVR1 which makes a receptor that controls bone growth in cells. Regeneron discovered that this mutated receptor has an abnormal response in the presence of Activin-A, a growth factor often secreted by the immune system in response to injury and inflammation.

Normally, Activin-A blocks the receptor, putting the brakes on bone growth. In individuals with the FOP mutation, Activin-A has the opposite effect. "It's as if the brakes are hot-wired to the gas pedal," Economides told Reuters.

The finding explains how abnormal bone forms in FOP patients, often in response to injuries or illness that cause tissue swelling or inflammation, he said.

To test their finding, researchers developed a therapeutic antibody designed to block Activin-A. When injected in mice that developed a form of the disease, the drug blocked the formation of excess bone.

Economides said the antibody works in a similar way to Regeneron and Sanofi's newly approved antibody drug Praluent, a cholesterol-lowering drug which blocks a receptor called PSCK9 on liver cells that controls the removal of "bad" LDL cholesterol.

Betsy Bogard, director of global research development for the International FOP Association and the sister of an FOP patient, called Regeneron's findings "incredibly exciting," as they help explain some of science behind FOP and also raise hope for a new treatment approach.

But Bogard, who is a former executive of the drug company Genzyme, a unit of Sanofi, remained cautious.