



People consuming vegan diet may have poorer bone health, suggests a new study on 72 men and women. Those following a vegan diet had lower ultrasound values compared to the other group, said researcher Andreas Hensel from the German Federal Institute for Risk Assessment.

Israeli tech can recharge EV battery in 5 mins

Lithium-ion (Li+) batteries with ultrafast charging can be a boon to electric vehicles, a growing sector in India

INNOVATION

HERZLIYA: From zero to full charge in just five minutes -- an Israeli start-up has developed technology it says could eliminate the "range anxiety" associated with electric cars.

Ultra-fast recharge specialists StoreDot have developed a first-generation lithium-ion battery that can dramatically reducing charging times.

"We are changing the entire experience of the driver, the problem of 'range anxiety'... that you might get stuck on the highway without energy," StoreDot founder Doron Myersdorf said.

Electric cars presently re-

quire 1-30 hours of charging time, depending on the company and the car model.

Hundreds of StoreDot prototypes are being tested by manufacturers.

His company, based in Herzliya, near Tel Aviv, is backed by four key investors: German automobile manufacturer Daimler, the UK's British Petroleum and the electronic giants Samsung and TDK.

Myersdorf, who set up the company in 2012, has tested the battery on phones, drones and scooters, before tackling the big prize of electric vehicles.

But Eric Esperance, an analyst at Roland Berger consulting firm, cautioned that while

ultra-fast charging would be a "revolution", many stages remain. "We are still far off from the industrial automotive market," he told AFP.

In 2019, the Nobel Chemistry Prize was awarded to John Goodenough of the US, Britain's Stanley Whittingham and Japan's Akira Yoshino for the invention of lithium-ion batteries.

Myersdorf said charging "speed was not part" of the original design that won the Nobel, so he worked on what was "considered impossible": a lithium-ion battery good to go in minutes.

The engineer switched the original graphite in the bat-



A StoreDot chemist works at the company's office in Herzliya. Batteries are assembled in a lab with large glass boxes, sealed to keep oxygen out | AFP

tery's negative anode with silicon. "We are taking that amazing innovation of the lithium-ion battery and up-

grading it to extreme fast charging capability," he said.

Long road

Manufacturers are gearing production towards less polluting vehicles. But the road is long.

On the ground, charging stations would have to be adapted for the new generation batteries, costing between \$1,500 and \$10,000 depending on capacity.

Electric cars are also still expensive, and in 2019 they represented 2.6% of global sales, as per the International Energy Agency. Recycling lithium-ion batteries remains a problem, with Esperance noting that each has a lifespan of between 3,000 and 3,500 charges.

Oral Covid treatment shows promising trial data: Merck

MEDICINE

THE world's German pharmaceutical giant Merck and a US partner reported promising results Saturday in trials of a drug administered orally to fight Covid-19, saying it helps reduce patients' viral load.

"At a time where there is unmet need for antiviral treatments against SARS-CoV-2, we are encouraged by these preliminary data," said Wendy Painter, chief medical officer of the US firm, Ridgeback Biotherapeutics.

In January, Merck halted work on two Covid vaccine candidates but has pressed on with research into two products to

treat the disease, including a pill-based one called molnupiravir, which it has developed with Ridgeback Biotherapeutics.

This drug caused a significant drop in patients' viral load after five days of treatment with it, Merck said at a meeting with infectious disease experts. This Phase 2a test -- drug trials have three stages before a product can be approved -- was carried out among 202 non-hospitalized people with symptoms of Covid-19.

There was no alert in terms of safety, and of four serious adverse events that were reported, none were considered to be related to taking this drug, Ridgeback said.

India-origin girl youngest on Europe math Olympiad team

EDUCATION

LONDON: A 13-year-old Indian-origin schoolgirl has become the youngest to be selected for the UK team which will compete at the prestigious European Girls' Mathematical Olympiad to be hosted by the eastern European country of Georgia next month.

Aanya Goyal, a student of Al-ley's School in Dulwich, south London, used the extended period of lockdown last year to throw herself further into her passion for mathematical problem-solving. With the help of her maths coach and former Math Olympian father, Amit Goyal, she focussed on a series of exams organised by the UK Mathematics Trust (UKMT) to select the British team for the EGMO.

"The Olympiad problems are all about being creative and digging deep. Sometimes a problem can take many days to solve but it is all about not giving up easily and to keep coming up with new ideas," said Aanya.

Over 600,000 secondary school students across the UK appear for the UKMT challenges every year and only the top 1,000 are invited to the British Mathemat-

ical Olympiad in November each year.

Of these, the top 100 are invited to Round 2 of the British Mathematical Olympiad in January -- a three-and-a-half-hour competition comprising four challenging problems.

Aanya went on to achieve a Distinction and was ranked among the top four girls to be selected for the UK team for the EGMO, also becoming the youngest -- a record held by a 15-year-old until now.

"Maths means problem-solving. Before I started school and in primary, I did a lot of puzzles, crosswords, sudoku variants and kakuro etc. In secondary, I did codebreaking, cypher challenges, chess, and linguistics," said the schoolgirl, who is excited about not only making the cut for the team but also being selected alongside one of her role models, Yuhka Machino, recognised as the world's best female mathematician.

As someone exempt from normal maths lessons at school, Aanya's entire focus is on specialised math problem-solving and she hopes to inspire others to overcome the view that maths is a tough subject.



Dutch drones protect crops



TECHNOLOGY

Dutch cress grower Rob Baan has enlisted high-tech helpers to tackle a pest in his greenhouses: palm-sized drones seek and destroy moths that produce caterpillars that can chew up his crops. "I have unique products where you don't get certification to spray chemicals and I don't want it," Baan said in an interview in a greenhouse bathed in the pink glow of LED lights that help his seedlings grow. His company, Koppert Cress, exports aromatic seedlings, plants and flowers to top-end restaurants around the world. A keen adopter of innovative technology in his greenhouses, Baan turned to PATS Indoor Drone Solutions, a startup that is developing autonomous systems as greenhouse sentinels, to add another layer of plant protection. The drones themselves are basic, but they are steered by smart technology aided by special cameras that scan the airspace in greenhouses.

Pharma players brainstorm to boost global vax output

Medicine: Global players are gathering online from Monday to brainstorm ways to rapidly boost vaccine production and fight a still-virulent coronavirus that has hobbled the world for 14 months. Meeting online Monday and Tuesday will be partners of the Covax vaccine distribution initiative, led by the Gavi vaccine alliance and backed by research arm the Coalition for Epidemic Preparedness Innovations as well as the WHO. Government delegates, scientists and pharma representatives as well as smaller drug makers from developing countries will also participate. The aim is "to shine the light on the gaps that we have currently in the supply chain, of reagents, of raw material, of products that you need to make vaccines", WHO's chief scientist Soumya Swaminathan said. The pharma industry aims to make 10 billion Covid-19 vaccine doses this year, which is double the 2019 capacity for all vaccines.

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Singapore turns to floating solar farms

CLIMATE

SINGAPORE: Thousands of panels glinting in the sun stretch into the sea off Singapore, part of the land-scarce city-state's push to build floating solar farms to cut greenhouse gas emissions. It may be one of the world's smallest countries, but the key financial hub is among the biggest per capita carbon dioxide emitters in Asia.

And while authorities have been pushing to change that, renewable energy is a challenge in a country with no rivers for hydro-electricity and where the wind is not strong enough to power turbines. So the tropical country turned to solar power -- however, with little land space in a place half the size of Los Angeles, it has resorted to setting up energy plants off its coasts and on reservoirs.

An island-state threatened by rising sea levels because of climate change, Singapore is aware of the urgency of cutting emissions, although critics say authorities' environmental commitments have thus far fallen short. The government last month unveiled a wide-ranging "green plan" that included steps such as planting more trees, reducing the amount of waste sent to landfills and building more charging points to encourage the use of electric cars.

Among the measures is increasing solar energy use four-fold to around two percent of the nation's power needs by 2025, and to three percent by 2030 -- enough for 350,000 households per year. As well as on water, solar power plants have already been built on rooftops and on the ground.

Rh INCOMPATIBILITY AND ITS IMPACT ON THE NEWBORN

Hemolytic disease of the newborn...

When a Rh negative woman is pregnant with a Rh positive child she may be exposed to the Rh antigen (foreign to her body) during the delivery or miscarriage. As a response to this, the woman develops antibodies to Rh antigen.

So, what is the problem?

If the woman is pregnant the next time with an Rh positive baby, the antibodies she had developed may enter the fetus and attack the Rh antigen on the fetal RBCs (red blood cells). When mature RBCs break down what remains are immature RBCs. They have lesser capacity to carry oxygen to all the body parts and the fetus develops anemia. This is known as hemolytic disease of the newborn.

The fetus can consequently suffer heart failure, leading to fluid buildup in various body parts.

Furthermore, bilirubin is formed as a result of RBCs getting destroyed. The baby's liver is not developed enough to clear the bilirubin. So, it can reach toxic levels and lead to jaundice.

The excessive bilirubin can also affect the brain causing the baby to have fever, loss of appetite and energy, uncontrollable movements, seizures, deafness, difficulties in speaking and mental retardation.

This condition can be fatal and requires either blood transfusion or a procedure in which the plasma is entirely replaced, removing all the toxins (plasmapheresis). Another treatment option is Phototherapy. There is some research to suggest that early liver transplant can be helpful.

It would be remiss not to mention the pain caused to the family of the baby suffering from this illness. The child will require constant care in an NICU. The emotional, physical and financial toll can be considerable.

What can we do about it?

The good news is; all this is preventable.

If a pregnant woman is of Rh negative blood type, it is advisable to receive medical attention during any situation in which she is likely to be sensitized by the fetal blood. This could be delivery, miscarriage, abortion or any invasive test or procedure. It is recommended that the mother be given Rh immunoglobulin within 72 hours of such an event. This will neutralize the Rh antigen from the baby's blood before the mother has a chance to even develop antibodies against it.

How is Rh incompatibility managed?

If an Rh negative woman is pregnant and has given birth to an Rh positive child in the past, the doctor can test for

Rh positive antibodies in her blood, do an ultrasonography (USG) to look signs of heart failure and even take a sample of amniotic fluid to check for bilirubin levels in the fetus (amniocentesis). It is possible to take a sample of fetal blood from the umbilical cord as well.

Once diagnosed, depending on the severity of the disease, the fetus may either require single or multiple intrauterine blood transfusions or it may have to be delivered early to manage complications.

Hemolytic disease of the newborn is a devastating disease for babies and their families and is a huge challenge to handle. But it does not have to be. Being forewarned is being forearmed and awareness of this condition can go a long way in saving lives.

Disclaimer: A public awareness initiative by Bharat Serums and Vaccines Limited, intended for general medical and health information and educational purposes only. Always seek the advice of your physician on any questions you may have regarding a medical condition or treatment before undertaking a new health care regimen.

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