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SCIENTIFIC NEWS

New UGC Regulation on board to categorize Indian Universities: In a significant development that will have a major impact on University education in India, the University Grants Commission (UGC) has approved a new set of Regulations called the UGC (Categorization of Universities for Grant of Graded Autonomy) Regulations, 2017. Under these, the Universities will be classified into three categories based on their National Assessment and Accreditation Council (NAAC) score and ranking under National Institute Ranking Framework (NIRF): Category I, Category II and Category III. The sole objective of the new regulation is providing greater autonomy to performing universities. Hence, the regulations have proposed that Category I and Category II institutions will be given greater autonomy in term of both academic and financial decisions and modalities.

Kalam satellite, World's lightest satellite launched by Tirupati boy: It was reported that Mr.K. Yagna Sai's, a native of Tirupati, who was part of the six-member team from Chennai-based Space Kidz India that designed KALAMsat, which was launched by NASA at Wallops, Virginia, on June 22. Mr.Sai is a B.Tech final year student at Hindustan University, Chennai, and Mr.Sai was the 'Lead Technician' in the team that designed the satellite termed as world's lightest (weighing a mere 64 gm) and also the first 3D-printed.

Northern River Terrapin, a critically endangered species gets new home: A critically endangered resident of the Sunderbans is set to get a new home, beginning a slow journey to recovery from a disastrous decline in the wild. It is more threatened than the Bengal tiger, but far less known. Before winter this year, three fresh water ponds in the Sunderbans Tiger Reserve will house the rare Northern river terrapin (Batagur baska), whose presence in the wild in West Bengal and Odisha had declined to undetectable levels a decade ago. Batagur baska, the 60-cm-long turtle that is presumed extinct in several Southeast Asian countries, is classified as critically endangered by the International Union for Conservation of Nature in its Red List of threatened species. The tiger, by comparison, is endangered.

HEERA will supersede UGC and AICTE: The University Grants Commission (UGC) and the All India Council for Technical Education (AICTE) will soon become history. The Sri.Narendra Modi government has decided to replace the two education bodies with one regulator. The new body will most-likely be called HEERA - Higher Education Empowerment Regulation Agency. The government has been mulling over the thought for quite some time now. Many experts had insisted for the radical change in education but the decision could not be taken. The final call was taken eventually in March at a meeting on education chaired by the Prime Minister. The human resource development (HRD) ministry and the Niti Aayog are working on the new law.

Goa to host science and art fete in November: The event will be held at various venues across the city from November 10 to19. Multiple projects will explore 'space' and its connection to science, philosophy, art and culture. Following the success of its first science-meets-art festival, The Story of Light, in Goa in 2015, its organisers are back this November with 'The Story of Space' festival. The Story of Space 2017 is an interdisciplinary, informal learning festival that will explore 'space' and its connection to science, philosophy, art and culture.

Novel Ways to Curb Metastasis: It was reported that when cancer cells get densely packed they secrete two proteins that deliver a stark message

to other cells: go away. This causes the cancer cells to break off from the pack and float through the blood stream or lymphatic system to other sites and start growing afresh. In the ongoing war against cancer, an international team led by scientists from Johns Hopkins University has found what causes the spread of cancer and what could slow it down (Nature Communications). This is important because 90% of cancer deaths are caused when cancer cells break off from the origin and start spreading elsewhere in the body. There are no existing drugs for stopping this spread, known as metastasis, of cancer. It was found that it was not the overall size of a primary tumor that caused cancer cells to spread, but how tightly those cells are jammed together when they break away from the tumor. And a medication mix that kept this microscopic message from being delivered and the two existing drugs, Tocilizumab and Reparaxin, prevented cancer cells from getting their marching orders. They discovered a new signaling pathway that, when blocked, could potentially curb cancer's ability to metastasize.

Nanoparticles from Curcumin provides new relief to TB Patients: Curcumin, the basic ingredient of turmeric, when administered in a nanoparticle formulation has several favourable properties in the treatment of tuberculosis in mice, and it was observed that nanoparticle curcumin to be five times more bioavailable (which is the proportion of drug that enters circulation after introduction into the body) in mice, than regular curcumin, and was able to drastically reduce liver toxicity induced by TB drug isoniazid. More importantly, treatment of TB with isoniazid along with 200 nanometre curcumin nanoparticles led to "dramatically reduced" risk of disease reactivation and reinfection. Treatment with anti-tuberculosis drugs takes about six-nine months in the case of drug-sensitive TB and 12-24 months for drug-resistant TB. Curcumin blocks the Kv1.3 potassium channel and prevents apoptosis, or cell death, of T cells that come up with an immune response. As a result, the protective, long-lasting memory cells called the central memory T cells get enhanced. Mice treated with curcumin nanoparticles and isoniazid were able to clear the bacteria at an accelerated rate in both the lungs and spleen.

Novel vaccine that lowers Cholesterol: A cholesterol-lowering vaccine has shown promise in mice, said researchers who announced they had started early-phase trials to see if it also works in humans. Such a treatment could offer a welcome alternative to widely used statins, the main pharmaceutical choice today for lowering cholesterol in people at high risk of heart attack or stroke. Early-phase trials checking if antigen, positive in mice, works in humans. The vaccine, dubbed AT04A, reduced cholesterol levels in trial mice by half, and reversed damage done to blood vessels due to plaque build-up by more than 60%, researchers said in a statement. The mice were given the vaccine after they were fed a fatty diet to resemble the high-cholesterol intake of a human Western-style diet. Levels of cholesterol were reduced in a consistent and long-lasting way. This resulted in a reduction of fatty deposits in the arteries and atherosclerotic damage, and reduced arterial wall inflammation. Atherosclerosis occurs when a waxy compound lines blood vessel walls, limiting blood flow and potentially triggering dangerous blood clots.

Photosynthesis may cure Heart disease: Scientists have found that using blue-green algae and light to trigger photosynthesis inside the heart could help treat cardiac disease, the top cause of death globally. Researchers injected a type of bacteria into the hearts of anaesthetised rats with cardiac disease. Using light to trigger photosynthesis, they were able to increase the flow of oxygen and improve heart function. The beauty of it is that it's a recycling system. The genesis of this somewhat mind—boggling concept

sprang from scientists searching for new ways to deliver oxygen to the heart when blood flow is restricted. The next round of experiments involved injecting the cyanobacteria into the beating hearts of anaesthetised rats with cardiac ischemia. They then compared the heart function of rats with their hearts exposed to light (for less than 20 minutes) to those who were kept in the dark. The group that received the bacteria plus light had more oxygen and the heart worked better. The bacteria dissipated within 24 hours, but the improved cardiac function continued for at least four weeks, he said. The researchers plan to investigate how to apply this concept to humans and how to deliver a light source to the human heart. They are also examining the potential of using artificial chloroplasts to eliminate the need for bacteria.

Genetic basis for longer life traced to Sharks: Greenland sharks, the longest living vertebrates on Earth which live for up to 400 years, could hold the secret to long life, geneticists mapping their DNA say. The sharks are believed to have unique genes which could help explain not only their incredibly long life span, but life expectancy in other vertebrates, including humans. The researchers sequenced the DNA from Greenland sharks, some of which were alive in the Georgian era. They are now searching for the 'unique genes' which could hold the secret to the shark's longevity. They sequenced the full mitochondrial genome (the complete mitochondrial DNA information of an organism) of almost 100 Greenland sharks, which includes individuals born in the 1750s. Since the Greenland shark lives for hundreds of years, they also have enough time to migrate over long distances and our genetic results showed exactly that. Most of the individuals in our study were genetically similar to individuals caught 1000s of kilometres away.

Genetics justifying the Aryan Migration doctrine: New DNA evidence is solving the most fought-over question in Indian history. Genetic research based on an avalanche of new DNA evidence is making scientists around the world converge on an unambiguous answer. It was stated that Genetic influx from Central Asia in the Bronze Age was strongly male-driven, consistent with the patriarchal, patrilocal and patrilineal social structure attributed to the inferred pastoralist early Indo-European society. This was part of a much wider process of Indo-European expansion, with an ultimate source in the Pontic-Caspian region, which carried closely related Y-chromosome lineages. across a vast swathe of Eurasia between 5,000 and 3,500 years ago. The scientists state that the prevalence of R1a in India was very powerful evidence for a substantial Bronze Age migration from central Asia that most likely brought Indo-European speakers to India.

Novel drug delivery system to kill cancer cells: Researchers at Indian Institute of Science Education and Research, Pune have successfully developed a novel cancer drug delivery system using graphene oxide nanoparticles. In a serendipitous discovery, they found that when a FDA-approved anticancer drug cisplatin was added, the graphene oxide sheets self-assembled into spherical nanoparticles enclosing the drug within. We were very surprised to see this kind of shape-shifting transformation of the graphene oxide sheets into a spherical structure. We are exploring the mechanism by which this happens. They stated that the drug is reacting with graphene oxide and transforming the graphene sheet into a ball-like structure, a kind of 'molecular stitching. The nanoparticles of 90-120 nanometre size containing cisplatin and either of the two anticancer drugs were taken up by cervical cancer cells leading to programmed cell death. The nanoparticle containing cisplatin alone was able to kill cancer cells. But there is additive effect when two drugs are used together and efficiency of killing the cancer cells becomes better. The drugs bind to the DNA strands and break the strands so cell division does not happen and programmed cell death ensues.

Superalgae to combat Coral bleaching: Researchers have found a solution to reduce coral bleaching by genetically engineering the micro-algae found in corals, enhancing their stress tolerance to ocean warming. These micro-algae are called Symbiodinium, a genus of primary producers found in corals that are essential for reef health and, thereby, critical to ocean productivity. Different species of Symbiodinium have large genetic variation and diverse thermal tolerances which effect the bleaching tolerance of corals. The researchers used sequencing data from Symbiodinium to design genetic engineering strategies for enhancing stress tolerance of Symbiodinium, which may reduce coral bleaching due to rising ocean temperatures. Very little is known about Symbiodinium, thus very little information is available to improve coral reef conservation efforts.

Earth turning out into a Plastic Hub: Humans have created 8.3 billion metric tonnes of plastics since early 1950s, and most of it now resides in landfills or the natural environment, a study has found. Researchers found that by 2015, humans had generated 8.3 billion metric tonnes of plastics, 6.3 billion tonnes of which had already become waste. Of that total waste, only 9 per cent was recycled, 12 per cent was incinerated and 79 per cent accumulated in landfills or the natural environment, researchers said. If current trends continue, roughly 12 billion metric tonnes of plastic waste will be in landfills or the natural environment by 2050, researchers said.

Anti Malarial drug enshields foetus from Zika infection: Commonly used malaria drug hydroxychloroquine can effectively block the Zika virus from crossing the placenta and getting into the foetus and damaging its brain, as reported by the researchers from Washington University School of Medicine. The drug already has approval for use in pregnant women. The placenta acts as a barrier to protect the developing foetus from disease-causing organisms. It prevents pathogens from reaching the foetus through a form of a garbage recycling system that removes some components of cells, termed autophagy. It was observed that the Zika virus actually manipulates the garbage recycling system to its own advantage. The Zika infection ramps up autophagy. So when we use a drug that inhibits or suppresses this ramping up, we can block the virus from infecting the foetus. (The Journal of Experimental Medicine). Pregnant mice infected with Zika virus was treated with the drug or a dummy for five consecutive days. Compared with the controls, there was significantly less virus in the placenta of mice that received the drug.

Massive seed production of Indian Pompano: The regional centre of ICAR-Central Marine Fisheries Research Institute has made a major breakthrough by undertaking mass scale seed production of Indian pompano for the first time in the world. Indian pompano (*Trachinotus mookalee*) is a marine fish belonging to the family Carangidae. It is low in landing from the wild. It contains Omega 3 and 6 fatty acids.

Obituary : Renowned Space Scientist Prof. UR Rao, Passed away on 24th July, 2017. The former ISRO Chief was serving as the Chairman of the Governing council of the physical research laboratory and the Chancellor of the Indian Institute of Science and Technology at Thiruvananthapuram. From Aryabhatta to the Mars Orbiter Mission, Prof.Rao has continued to work with the space agency on several of its projects.

Prolific Physicist and Educationist Prof.Yash Pal, is a Scientist, communicator and institution builder, passed away on 25th July, 2017. Belonging to an era of scientists who espoused 'Make In India' decades before it became a politico-marketing cliché. Prof.Pal has began his career as a Professor at the TIFR. A scientist of international repute, Prof.Pal was awarded the

Padma Bhushan in 1976 and India's second highest civilian honour, the Padma Vibhushan, in 2013. He made significant contributions in the field of science and to the study of cosmic rays, high-energy physics, astrophysics. He served as UGC chairman and leads a committee for Higher Education reforms in India and advocated to establish a single regulator.

OPPORTUNITIES

International centre for Genetic Engineering and Biotechnology-Post Doc Fellowships: ICGEB offers competitive Postdoctoral Fellowships in Life Sciences to highly motivated scientists wishing to pursue postdoctoral research in a world-class scientific environment. Refer web site: https://www.icgeb.org/postdoc-application.html. Closing Dates for Applications 31 March and 30 September (two times a year).

IISER Pune Postdoctoral Research Associate: Applications are invited for Postdoctoral Research Associate (PRAs) positions at the Indian Institute of Science Education and Research (IISER) Pune, India. These positions are open for candidates with 0-5 years of experience after the submission of their PhD thesis. Candidates may apply by email by sending the following documents to postdocapplications@iiserpune.ac.in and refer web site http://www. iiserpune.ac. in/links / postdoctoral-research. Complete applications would be considered in March and September of each year; the deadlines are March 1 and September 1 (two times a year).

SERB-National Post Doctoral Fellowship (N-PDF): The SERB-National Post Doctoral Fellowship (N-PDF) is aimed to identify motivated young researchers and provide them support for doing research in frontier areas of science and engineering. The fellows will work under a mentor, and it is hoped that this training will provide them a platform to develop as an independent researcher. The call for applications for SERB-N PDF will be notified twice a year (September and March) through the website www.serbonline.in and www.serb.gov.in.

The Directorate for Biological Sciences (BIO): The Directorate for Biological Sciences (BIO) awards Postdoctoral Research Fellowships in Biology to recent recipients of the doctoral degree for research and training in selected areas supported by BIO and with special goals for human resource development in biology. Contact, Michael J. Vanni, email-bio-dbi-prfb@nsf.gov and Diane Jofuku Okamuro, email- dokamuro@nsf.gov. Full Proposal Deadline Date, November 7, 2017.