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NEWS ITEM

Dr. APJ ABDUL KALAM PASSES AWAY

Shillong: India's 11th President APJ Abdul Kalam died on Monday evening at a hospital in Meghalaya, where he had gone to deliver a lecture at Indian Institute of Management, Shillong . He was 83years old.

Dr.Abdul Kalam is known as the *Missile Man of India* for his work on the development of ballistic missile and launch vehicle technology. He also played a pivotal organizational, technical and political role in India's *Pokhran-II* nuclear tests in 1998, he was the project director of India's first Satellite Launch Vehicle (SLV-III) which successfully deployed the *Rohini* satellite in near-earth orbit in July 1980. He has received several prestigious awards, including the Bharat Ratna, India's highest civilian honour. The former President had collapsed during the lecture at the Indian Institute of Management, Shillong, around 6.30 pm. He was taken to the Bethany hospital. Doctors said he had suffered from a massive cardiac arrest.

SCIENTIFIC FINDINGS

New species of frog, fish found in Western Ghats : Researchers have discovered a new fish species and three types of tadpoles in Western Ghats of India. Newly discovered fish species: Pethiastriata- it was found along the streams of the Tunga in the Kudremukh National Park, Karnataka. Pethiastriata is described as a small fish, with a length of around 4 cm. The male is reddish incolour and the female,greyish.The species thrive in shallow pools of gently flowing water and are found in small groups of around four.The fish differ from existing species on seven characteristics, including dark outer edges of scales that give them a distinct striped pattern. Species of tadpoles: They belong to the species of Nyctibatrachus ('night frog') - *N. kumbara* ('potter frog'), *N. kempholeyensis* (named after the Kempuhole stream) and *N. jog* (named after the waterfall). These species of tadpoles were found for the first timein the narrow streams of the Sharavati in Karnataka.

2. First malaria vaccine likely by October : The RTS,S/AS01 vaccine was developed for use in sub-Saharan Africa where malaria still kills around 1300 children every day. The first malaria vaccine candidate to reach phase-3 of clinical testing was found to partially protect children against the disease up to four years after vaccination and may be available by as early as October this year, scientists reported. The results suggest that the vaccine candidate RTS,S/AS01 could prevent a substantial number of cases of clinical malaria, especially in areas of high transmission. "The European Medicines Agency (EMA) will assess the quality, safety, and efficacy of the vaccine based on these final data," said corresponding author Brian Greenwood, Professor at the London School of Hygiene & Tropical Medicine in Britain."If the EMA gives a favourable opinion, WHO (World Health Organization) could recommend the use of RTS,S/AS01 as early as October this year. If licensed, RTS,S/AS01 would be the first licensed human vaccine against a parasitic disease," Greenwood added. The findings revealed that vaccine efficacy against clinical and severe malaria was better in children than in young infants, but waned over time in both groups.However, protection was prolonged by a booster dose, increasing the average number of cases prevented in both children and young infants.There is currently no licensed vaccine against malaria anywhere in the world. The findings were published in the journal The Lancet.

At 603 kmph, Japan's maglev train breaks its own speed record : A Japanese maglev, which is the fastest passenger train in the world, has broken its own speed record. Operator JR Central said the train reached 603 kmph in a test run surpassing its previous record of 581 kmph set in 2003. The train travelled for about 2 km at a

speed exceeding 600 kmph. Japan's high-speed rail services are among the most advanced in the world, with hundreds of trains running each day with minimal delays. The Maglev Test Line, near Mount Fuji about 80 km west of Tokyo, is developing technology for use on a future link between Tokyo and Osaka. The magnetic levitation trains hover above rails, suspended by powerful magnets.

Earthquakes unveil deep rock structure under East Asia : Scientists have found a towering rock structure deep under East Asia by using 3-D supercomputer simulations of data from 227 earthquakes that hit the region during 2007-2011. The finding could throw light on the fate of the subducted continental plates beneath the Tibetan Plateau, known as 'the roof of the world,' which rises about 5km above sea level. The work may also help find hidden hydrocarbon resources, and more broadly it could help explore the Earth under East Asia and the rest of the world, researchers said."We are combining different kinds of seismic waves to render a more coherent image of the Earth," said principal investigator and lead author Min Chen from the Rice University. Researchers combined seismic records from thousands of stations for each earthquake to produce scientifically accurate, high-resolution 3-D tomographic images of the subsurface beneath immense geological formations. Like a thrown pebble generates ripples in a pond, earthquakes make waves that can travel thousands of miles through the Earth. The research was published in the Journal of Geophysical Research, Solid Earth.

Scientists document 'virgin births' of endangered sawfish in Florida : Scientists have documented in Florida a series of "virgin births," reproduction without mating, in acritically endangered sawfish species pushed to the brink of extinction by over-fishing and habitat destruction. Scientists say that for the first time the phenomenon called parthenogenesis has been seen ina vertebrate in the wild. They also say that some females may be resorting to asexual reproduction because small tooth sawfish numbers are so low that mating opportunities may not exist

CSIR succeeds in Whole Genome Sequencing of Holy basil (Tulsi) : CSIR-Central Institute of Medicinal & Aromatic Plants (CSIR-CIMAP), Lucknow, has published wholegenome sequence of Ocimum sanctum, the wonder plant 'Holy basil' or 'Tulsi'. This is the first report of complete genome sequence of a traditional and most respected medicinal plant of India, using a composite next generation sequencing technologies.Whole genome sequencing is a laboratory process that determines the complete DNA sequence ofan organism's genome at a single time. Benefits of Whole genome sequencing: Considering the metabolic and therapeutic potential of this revered plant, the availability of whole genome sequence is the first step to understand and unravel the secrets of this 'mother of all herbs' and to provide scientific validity to the traditional claims of its utility in diverse medicinal usage. The availability of the genome sequence now opens the possibility to identify genes involved inproducing therapeutic molecules and to produce them in vitro.This will also facilitate identification of not yet identified genes involved in the synthesis of important secondary metabolites in this plant.

Rat brain cells power a computer : A rat trained to control a robot is an interesting 'Pavlovian' experiment by itself. But, independently-cultured rat brain cells aiding a robot navigate through an obstacle seems straight out of science fiction. Having cultured brain cells on a glass plate and kept in sterilized conditions, a group of researchers at Indian Institute of Science (IISc) demonstrated that this tissue culture can read signals from an infra-red enabled robot, process the problem of obstacles, and give an appropriate, accurate solution The results of the 2.5-year-long experiment were described by the Scientists — from the Center for Nanoscience and Engineering (CeNSE) and Electrical Communications Engineering at IISc — took the

rat brain cells (hippocampus of just-born rat pups) and cultured it on a specialized glass plate that is covered with multiple electrodes that can detect the most minute spiking in voltages generated by the cells. The cultured cells start to grow dendrites —The cells form a network that shows spontaneous electrical activity through tiny voltage spikes. Interpretation of these spikes is done through an electronics platform that can detect as well as send electrical impulses (of just 500mV amplitude) to the cultured tissue through the embedded electrodes. These impulses are fed through the computer to the cells, which process the information, and the resulting voltage spikes — for commands of front, back, left and right — are translated into codes for the robot. Run over 10 minutes, with obstacles moved around in random, the robot was able to navigate successfully nearly 98 per cent of the time. Though still nascent, the "Neuro-electronic hybrid systems" experiment allows researchers to develop electronic systems that use the learning and processing abilities inherent in brain cells. Jude Baby George from CeNSE believes the system has the potential to build a computing system with "wetware" — a combination of hardware, software and neural functions of organic matter — capable of adapting and solving real-world problems.

MDR-TB spreads less within households

There are greater chances of controlling the spread of MDR-TB due to its lower fitness. : Unlike people with drug-susceptible TB, those with multi drug-resistant TB (MDR-TB) are less likely to transmit disease to others living in the same household (also known as household contacts), a study published on June 23 in the journal PLOS Medicine found.Although it may not be right to extrapolate the findings to the community level, within households, MDR-TB surely has "relatively low fitness [be less capable of spreading] compared with drug-susceptible TB."The study results agree with those of previous animal and laboratory studies, as well as molecular epidemiology studies that had estimated that the fitness level of drug-susceptible TB bacteria to spread within populations was higher than MDR-TB bacteria. But animal and lab studies do not take into account the clinical, environmental and socio-economic factors that influence infection. Hence, the latest study has great significance.The study carried out in South Lima and Callao, Peru followed up people living in the same household as the index patient for three long years (2010-2013). The study tracked 213 MDR-TB index patients and 1,055 of their household contacts. In the case of drug-susceptible TB patients, the study followed 487 index patients and their 2,362 household contacts.While only 35 of 213 of MDR-TB contacts developed MDR-TB disease, 114 of 2,362 drug-susceptible TB contacts developed disease. The hazard ratio for TB disease for household contacts of MDR-TB index cases was "half" that of the household contacts of those with drug-susceptible TB. As a rule, people who are in close contact for extended periods of time with a person who has TB disease — either drug-susceptible TB or MDR-TB — are at heightened risk of getting infected and suffering from TB The study found that male household contacts and those who slept in the same room as the index patient had higher incidence of active TB than those who did not share a sleeping room. Also, household contacts who had diabetes or HIV or who had previous history of active TB had higher incidence of active TB.While contacts from the lower socio-economic strata were more likely to suffer from active TB, crowding (large number of people in a household) was "not significantly" associated with higher incidence of TB disease. The results of the study indicate that there are greater chances of controlling the spread of MDR-TB due to its lower fitness. But there can be no room for complacency as the MDR-TB can become fitter with time and be equally transmissible as drug-susceptible TB.

Bombay Blood: how the rare blood type was discovered : A heart-warming piece of news was reported about two weeks ago regarding a life-saving instance of blood donation. An infant,

Sandesh Kumar from Gorakhpur, U.P., was found to have an inborn heart condition that needed surgery to set it right. This required blood donation. But the youngster has a very rare blood type. His blood is not O, A, B, or AB, but a special type called (hh)- a rare one first discovered in Bombay in 1952, and hence christened as Bombay Blood. People who carry this rare blood type, about 1 in 10, 000 Indians, can accept blood only from another Bombay Blood type individual, and not from anyone who is O, A, B or AB type. Why is it called Bombay Blood, and how was it discovered?. Dr Durgadas Kasbekar of CDFD Hyderabad has written a detailed and lucid article about it in the forthcoming issue of the journal Indian Journal of History of Science, What is the biology behind this exceptional blood type? To understand this, let us first look at what each blood group type contains. Blood contains red blood cells (and other cells that are not relevant for us here, floating in a fluid called plasma. Red blood cells carry on their surface a set of markers with which the plasma interacts. This compatibility or cross-talk between the cell and the plasma is what makes each blood type special. The markers on the cell are determined by a master type called H, out of which are generated types A, B, AB and AO. Bombay doctors found that the hh type (Bombay type people) can accept only from other hh type, and also can receive only from the hh types. This makes the Bombay Blood types a very special and rare category of people. How did this happen and why are these people so rare? It is largely because of extensive inbreeding within the same lineage or close-community marriages, often consanguineous, such that the 'blood type' or the gene pool is greatly restricted. Such intra-community marriages have happened in small isolated communities such as the gypsies, Russian Jewish or Parsi communities. It is thus likely that the Bombay Blood types have common ancestral origins.

Phase I clinical trials for Ebola virus concluded : At this time, there are no vaccines to protect against EVD licensed for use in humans. Clinical trials for several candidate vaccines are in various phases and a safe and effective vaccine is hoped for by the end of 2015.Phase I clinical trials for two vaccine candidates – ChAd3-ZEBOV, developed by GlaxoSmithKline (GSK), in collaboration with the US National Institute of Allergy and Infectious Diseases (NIAID) and rVSV-ZEBOV, developed by NewLink Genetics and Merck Vaccines USA, in collaboration with the Public Health Agency of Canada – were concluded in January. Both have been shown to be safe and well tolerated in humans in Phase I clinical trials. The results from the trials for rVSV-ZEBOV were recently published in the New England Journal of Medicine.

POPULAR SCIENCE NEWS

Kasturirangan report to be implemented by year-end : Union Minister of State for Environment and Forests Prakash Javadekar recently said that the recommendations made by the Kasturirangan Committee report on eco-sensitive zones in the Western Ghats would be implemented by this year-end.He said that the Union government had asked the State governments concerned to hold consultation with the local population and submit their comments.While Kerala has submitted its comments, Karnataka is yet to do so. Tamil Nadu, Goa, Maharashtra, and Gujarat are expected to submit their reports shortly. The Kasturirangan panel was set up to study the Gadgil committee report on the Western Ghats. The Gadgil panel report had faced unanimous opposition from state governments for recommending that almost three-fourth of the hills, including plantations, cultivated lands and large habitations, be turned into a restricted development zone with an over-arching authority to regulate the region supersedingthe elected authorities' role. Recommendations made by the Kasturirangan panel:Around 60,000 sq km of Western Ghats, spread across six states, should be turned into a no-goarea for commercial activities like mining, thermal power plants, polluting industries and largehousing plans.It has suggested that 90% of

the natural forests left in the Western Ghats complex – adding upto60,000 sq km and constituting 37% of the entire hilly belt — be conserved under theEcologically Sensitive Area (ESA) provisions of the green law. The forest area falling within theESA would also cover 4,156 villages across the six states. The villages falling under ESA will beinvolved in decision making on the future projects. All projects will require prior-informed consentand no-objection from the gram sabha (village council) of the village.The panel has recommended that there should be a complete ban on mining activity in this zoneand current mining activities should be phased out within five years, or at the time of expiry of the mining lease.

'Over 70% of Everest glacier may be lost by 2100' : A paper published in "The Cryosphere", a journal of the European Geosciences Union, is a first approximation to how the Himalayan glaciers will react to increasing temperatures in the region. Over 70 per cent of the glacier volume in the Mount Everest region in the Himalayas could be lost in 85 years if greenhouse gas emissions continue to rise, a new paper suggests. It also indicates more flood risk in the future in the Kosi river downstream from Nepal to India. The paper, "Modelling glacier change in the Everest region, Nepal Himalaya", published on Wednesday in The Cryosphere, a journal of the European Geosciences Union (EGU), said the glacier volume could be reduced between 70 and 99 per cent by 2100. paper stresses that "the signal of future glacier change in the region is clear and compelling" and that decreases in ice thickness and extent are expected for "even the most conservative climate change scenario".

Large Hadron Collider resumes atom smashing after two-year pause : Scientists say they have successfully restarted the world's biggest particle collider after a two-year shutdown and upgrade and it's now producing almost double the collision energy of its first run. The European Organisation for Nuclear Research, or CERN, said on Wednesday the Large Hadron Collider will now run around the clock for the next three years. The collider underwent a $150 million-upgrade after its first run, which produced results that helped confirm the existence of an elusive subatomic particle, the Higgs boson. CERN's director, Rolf Heuer, says physicists hope the new run might lead to discoveries that could help "explain remaining mysteries such as dark matter". The LHC, located in a 27-km tunnel beneath the Swiss-French border, is now smashing together protons at 13 trillion electronvolts.

SCIENTIFIC INNOVATION

Smartphone technology enables blind to 'see' : Scientists are developing new adaptive mobile technology that could enable visually-impaired people to 'see' through their smartphone or tablet. Specialists in computer vision and machine learning based at the University of Lincoln, UK, funded by a Google Faculty Research Award, are aiming to embed a smart vision system in mobile devices to help people with sight problems navigate unfamiliar indoor environments.Based on preliminary work on assistive technologies done by the Lincoln Centre for Autonomous Systems, the team plans to use colour and depth sensor technology inside new smartphones and tablets to enable 3D mapping and localization, navigation and object recognition.The team will then develop the best interface to relay that to users - whether that is vibrations, sounds or the spoken word.

OPPORTUNITIES

Postdoctoral fellowships: Research Associate (Postdoc) at Molecular Biology and Genetics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research Bengaluru. Job description: The applicant should have a Ph.D. The applicant should be well versed in mammalian cell culture, fluorescent microscopy, and basic molecular biology techniques. Proficiency in handling and carrying out mouse work would be a plus. Should have good oral and written communication skills and must be able to work in a team. http://www.jncasr.ac.in/ravim/index.html. Application

Deadline : 31/08/2015
Contact-Ravi Manjithaya-ravim@jncasr.acin

Employer -WT/DBT India Alliance. Location-Road No. 12, Banjara Hills, Hyderabad, Andhra Pradesh, India. Discipline -Life Sciences, Health Sciences. Position Type -Full Time

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Intermediate Fellowships: For postdoctoral researchers who want to establish an independent research career in India. *For applicants with 4-7 years of post-PhD research experience.* **Preliminary applications due by 13 August, 2015. Application forms will be available** on the India Alliance Online application System (IASys) at https://fellowships.wellcomedbt.org/Login.aspx. Please visit our website http://www.wellcomedbt.org for further information on the application process. Please write to us with queries to info@wellcomedbt.org

The National Centre for Biological Sciences (NCBS) and University of Cambridge: The National Centre for Biological Sciences (NCBS), Bangalore, the Institute for Stem Cell Biology and Regenerative Medicine (inStem), Bangalore, and the University of Cambridge are pleased to announce the NCBS-inStem-Cambridge Postdoctoral Fellowship.The Fellowship allows for the joint-appointment of up to 4 Postdoctoral Fellows per year to work in Cambridge for half the period of a 4 year term, with the other half of the tenure to be completed in a partnering research group based in NCBS or inStem. **Further information:** Further information on NCBS and in Stem is available through their respective annual reports here and here. Please contact Dr Mani Shankar Narayanan at the University of Cambridge's International Strategy Office (msn28@cam.ac.uk), or Dr Rashi Tewari at the NCBS Academic Office (rashi@instem.res.in) for any additional information.

ICGEB (International Centre for genetic Engineering and Biotechnoogy) offers competitive Postdoctoral Fellowships in the Life Sciences to highly motivated scientists wishing to pursue postdoctoral research in a world-class scientific environment. The Fellowships consist of a very competitive package including stipend, health insurance and additional benefits. The most successful fellows will also be eligible to apply for ICGEB Early Career Research Grants to support their own research programmes as young PIs upon return to an ICGEB Member State. Closing Dates for Applications: 31 March and 30 September 2015.

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