

NEWSPAPER HIGHLIGHT

Researchers at the Indian Institute of Technology (IIT), Kanpur, have discovered that a particular gene (DLX1) which plays an important role in the development of jaws, skeleton, and interneurons in the brain has an important role to play in the growth and development of prostate cancer. The DLX1 protein is found at elevated levels in prostate cancer patients, the reason why the DLX1 protein has been used as a urine-based biomarker. Now the team of researchers led by Dr. Bushra Ateeq, Professor at the Department of Biological Sciences and Bioengineering, IIT Kanpur has found that the DLX1 protein, which is expressed at higher levels in the prostate cancer cells, has a huge role in the growth and development of the tumour and the spread of the cancer to other organs in the body (metastasis).

Chemists, when they are designing or building new molecules, can be thought of as architects and builders. An organic chemist can plan a blueprint for a new molecule, and synthesize it with precision out of atoms of carbon, oxygen, hydrogen and so on. After centuries of fine tuning this skill, chemists in the early 20th century moved up to synthesizing long, thread-like one-dimensional polymers. The polyethylene of plastic bags is made from repeating units of the ethylene molecule, (importantly, the units are linked by the same firm chemical bonds as are seen within an organic molecule. This provides the stability that ensures that a shirt made from polyester mixed yarn is long-lasting). In biological systems, proteins are 1-dimensional polymers of amino acids. In recent years, this has been taken to a new level by the creation of extended 2 or 3 dimensional structures from linking together molecular units just as was done for polymers, but in two or three dimensions. The basic units go on fitting together to form large networks, like a wire mesh fence. The network is constructed by repeated additions of a molecule with symmetry. A few such networked sheets, when stacked one over another, form a functional 2D entity.

In the last week of May 2021, when large areas of the Sunderbans were inundated by saline water under the impact of Cyclone Yaas, farmers across the region had given up hope

PANDORA PAPERS

1. It is found that there are 380 persons of Indian nationality in the Pandora Papers. Pandora Papers are 2021 leak of 11.9 million files that reveal the hidden unethical or corrupt dealings of the global wealthy and elite for tax avoidance and corruption. The papers details how such individuals sheltered money in cash, offshore accounts, tax havens, shell companies, and real estate investments that hide the true ownership of billions of dollars of assets. While offshore assets and accounts are not always illegal, hiding assets and avoiding taxation is.

2. **Pandora Papers** is the largest such data dump released to date, larger than the previous Panama Papers and Paradise Papers leaks. Pandora were compiled by the International Consortium of Investigative Journalists (ICIJ), which is the same group who provided the Panama Papers and Paradise Papers, exposing similar dealings.

3. **Panama Papers**- They refer to the 11.5 million leaked encrypted confidential documents that were the property of Panama-based law firm Mossack Fonseca. They were released in 2016, by the German newspaper Süddeutsche Zeitung (SZ), dubbing them the "Panama Papers." SZ and ICIJ went into deciphering the encrypted files before the revelations were made public.

4. **Paradise Papers**- They are 13.4 million leaked documents of offshore activities of national leaders, wealthy individuals, and companies. The leak originated from the Bermudian offshore law firm Appleby. Süddeutsche Zeitung obtained the files and then turned them over to the ICIJ, who then shared them with other media outlets. The Paradise Papers have prompted governments to conduct audits and investigations, and implement policy reform.

GILOY HERB

1. Ministry of Ayush said that the Giloy or Guduchi herb (*Tinospora cordifolia*) is safe to use but similar-looking plants in circulation such as *T. crispa* can be harmful. Giloy is a climbing shrub and an essential herb in Ayurvedic medicine.

2. People have long used it to treat a wide range of issues, including fever, infections, diarrhoea and diabetes. Guduchi has well-established hepato-protective properties. Hepatoprotection (Antihepatotoxicity - opposite to hepatotoxicity) is the ability of a chemical substance to prevent damage to the liver. Hepatoprotection offered by the plant extracts was primarily attributed to its anti-hepatotoxic and antioxidant properties.

3. **The Ministry had a well-established system of Pharmacovigilance (for reporting of suspected adverse drug reactions from Ayush medication), with its network spreading across all over India.**

i-DRONE

1. Union Health Minister launched ICMR's Drone Response and Outreach in North East (i-Drone), which is a drone-based vaccine delivery model. This delivery model will ensure that life-saving vaccines reach everyone, including the remote areas and hard to reach terrains.

2. This is for the first time that a 'Make in India' drone has been used in South Asia to transport COVID vaccine. It was used to deliver vaccines in Manipur, Nagaland and Andaman and Nicobar.

3. **It will epitomise the Government's commitment to 'Antyodaya' in health; make healthcare accessible to the last citizen of the country.**

STUDY ON ASTRONOMICAL OBSERVATORIES

1. A recent study has shown that the Indian Astronomical Observatory (IAO) at Hanle in Ladakh is becoming one of the promising observatory sites globally. Paranal, located in a high-altitude desert in Chile, is found to be the best site in terms of clear skies with around 87% of clear nights in a year.

for fresh crop this season. Based on earlier experiences of cyclones, many farmers like Biswajit Jana thought that they might not cultivate for the next few years. However, a unique project of reclamation of soil salinity in the Sonagaon village in Gosaba block has given hope to many farmers of the region.

Archaeologists have uncovered evidence that hunter-gatherers in North America were using tobacco around 12,300 years ago — 9,000 years earlier than was previously documented. There is much debate on how and when tobacco plants were first domesticated. Researchers have discovered the oldest direct evidence of tobacco use at a hunter-gatherer camp in Utah's West Desert.

Research by Dalhousie University and reported in Science found that seagrass meadows are much more genetically diverse and thus resilient in areas where otters are present. Otters leave their trademark pits and craters on ground while digging for clams. The rough treatment of lush seagrass meadows appears to be producing a reproductive favour.

University of Sydney astronomers have discovered unusual signals coming from the direction of the Milky Way's centre. The radio waves fit no currently understood pattern of variable radio source and could suggest a new class of stellar object. The light from the new signal oscillates in only one direction and that direction rotates with time. The brightness also varies dramatically.

A lunar probe launched by the Chinese space agency recently brought back the first fresh samples of rock and debris from the moon in more than 40 years. Now an international team of scientists has determined the age of these moon rocks at close to 1.97 billion years old. All of the volcanic rocks collected by Apollo were older than 3 billion years.

President Gotabaya Rajapaksa has appointed a task force on 'green agriculture', his office said, while Sri Lanka's farmers continue protesting his government's abrupt 'organic fertilizer only' policy shift since May this year. The 'Presidential Task Force' will be responsible for looking into the requirement of fertilizers and improving the quality of organic fertilizer produced in the country.

Department of Agriculture, said the only technique known for desalination is freshwater irrigation which is very difficult in the Sunderbans. "The salinity of the

2.The study analysed datasets for the IAO in Hanle and Merak (Ladakh), and Devasthal (Nainital) in India. It found that the Hanle site is promising due to its advantages of, More clear nights (270 in a year), As dry as Atacama Desert in Chile and much drier than Devasthal, Minimal light pollution, background aerosol concentration.

3.Extremely dry atmospheric condition, and Uninterrupted by monsoon. Trans-Himalayan region is becoming one of the promising sites globally for the next generation of astronomical observatories, due to the above advantages.

4.IAO-Hanle is seen as one of the emerging sites for infrared and sub-mm optical astronomy because water vapour absorbs electromagnetic signals and reduces their strength. Night observations at IAO-Hanle from 2m-Himalayan Chandra Telescope (HCT) are possible throughout the year without any interruption due to monsoons. Devasthal has a slightly larger number of clear nights compared to the other sites in the sub-continent but are affected by monsoons for about three months in a year.

5.Such studies of long-term meteorological parameters help IIA plan for several mega-science projects in the high-altitude Ladakh region such as National Large Solar Telescope (NLST) of 2-meter aperture at Merak and National Large Optical Telescope (NLOT) of 8-10 meter aperture at Hanle.

6.Indian Astronomical Observatory Located in Hanle, Ladakh, the Indian Astronomical Observatory (IAO) is operated by the Indian Institute of Astrophysics, Bangalore. It has one of the world's highest located sites for optical, infrared and gamma-ray telescopes. It is currently the ninth highest optical telescope in the world, situated at an elevation of 4,500 meters (14,764 ft).

LINEAR NON-THRESHOLD MODEL FOR RADIATION SAFETY

1.The U.S. Nuclear Regulatory Commission (NRC) upheld the Linear No-Threshold (LNT) dose-effect model to prescribe radiation safety standards. LNT model states that biological effects such as cancer and hereditary effects due to exposure to ionising radiation increase as a linear function of dose, without threshold.

2.The petitioners supporting the request to discontinue use of the LNT model has supported the concept of "radiation hormesis" Radiation Hormesis is a concept that posits that low doses of ionising radiation protect against the deleterious effects of high doses of radiation and result in beneficial effects to humans.

3.Petitioners proposed the following to be done saying that "it makes no sense to decrease radiation doses that are harmless and hormetic". To increase the dose limits to workers; To raise the public dose limits to be the same as the worker doses; To end differential doses to pregnant women, embryos and fetuses, and children less than 18 years of age; To remove the As Low As Is Reasonably Achievable (ALARA) principle entirely from the regulations.

4.NRC has determined that the LNT model continues to provide a sound regulatory basis to minimize the risk of unnecessary radiation exposure to both members of the public and radiation workers. Therefore, the NRC will maintain the current dose limit requirements.

UNITY SMALL FINANCE BANK

1.The RBI has issued a Small Finance Bank (SFB) license to the consortium of Centrum Financial Services and Digital payments platform BharatPe.

2.What are SFBs? Small Finance Banks is a specific segment of banking created by RBI with to undertake basic banking activities to un-served and underserved sections. The draft guidelines for licensing of small banks in the private sector were formulated and released by RBI in 2014.

3.Objectives-The objectives of setting up of small finance banks will be to further financial inclusion by Provision of savings vehicles Supply of credit to small business units, small and marginal farmers, micro and small industries and other unorganised sector entities, through high technology-low cost operations.

4.The RBI has issued a new bank license after a gap of nearly 6 years and the new SFB has been incorporated as 'Unity Small Finance Bank'. The assets and liabilities of Punjab and

plot after the cyclone was 17.4 dS/m [salinity is measured using deciSiemens per metre dS/m] but after the desalination exercise it was down to 2.04 dS/m. We also cultivated a variety of paddy which is relatively less resistant to soil salinity and the output has been very encouraging.

After several delays in its modernisation process, the Army Air Defence (AD) is looking at major progress in the next few months in terms of deals and trials. These include additional indigenous Akash surface-to-air missile (SAM) systems, the underdevelopment medium range surface-to-air missile (MRSAM) and IglaS very short range air defence (VSHORAD) systems from Russia, according to defence officials.

Maharashtra Co-operative Bank will be taken over by the new entity. This proposal sheds light on the need for traditional lenders to expand their digital infrastructure. In the buy-now-pay-later (BNPL) and micro-lending models, companies like Paytm, Google Pay, Amazon Pay, etc. have partnered with NBFCs to assess creditworthiness of an existing customer and present it to the lender as a potential borrower.