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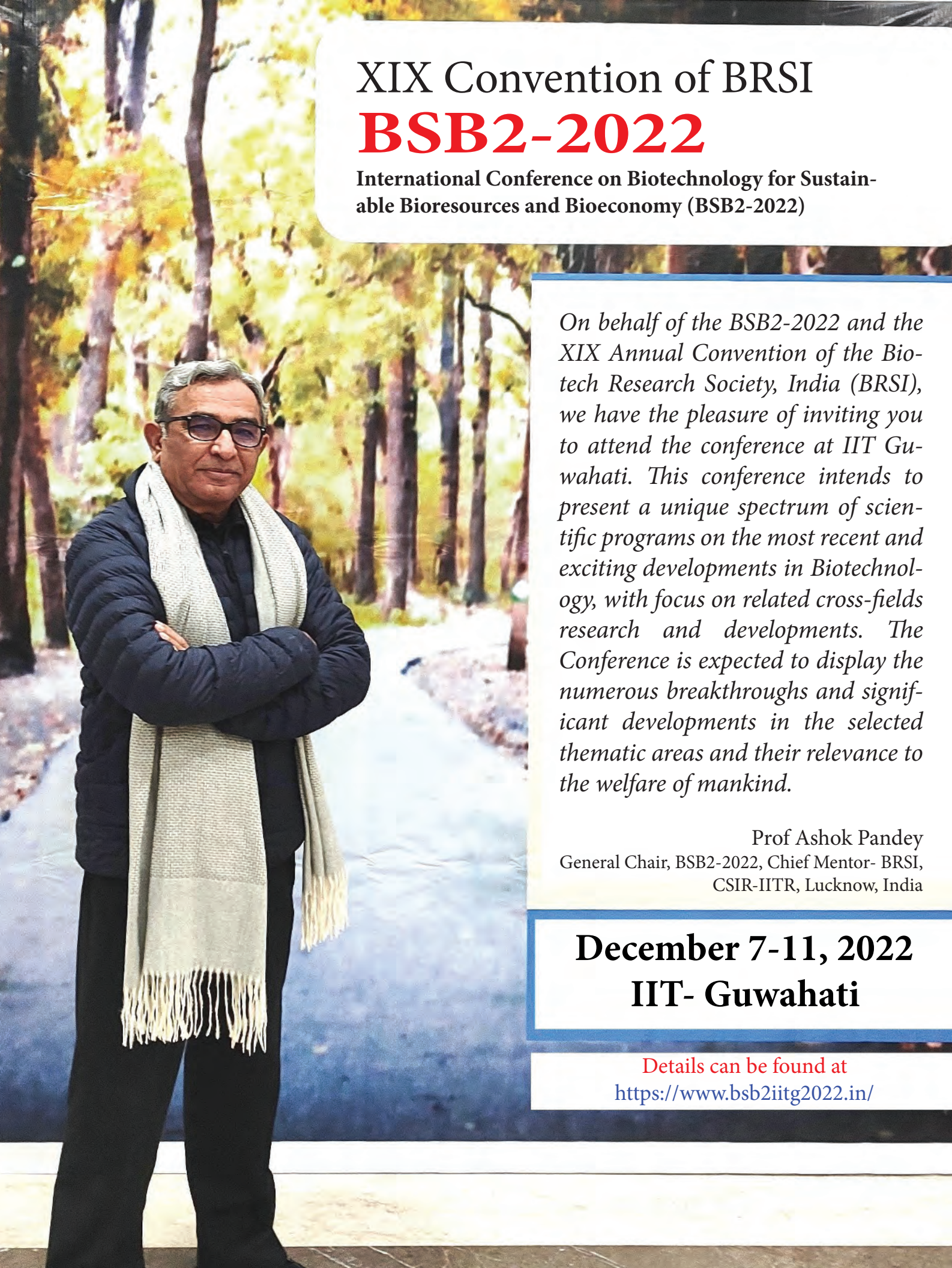
BIOTECH EXPRESS

The two sides of India's first edible GM crop Dhara Mustard Hybrid (DMH 11) approval



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BSB2-2022

International Conference on Biotechnology for Sustainable Bioresources and Bioeconomy (BSB2-2022)

On behalf of the BSB2-2022 and the XIX Annual Convention of the Biotech Research Society, India (BRSI), we have the pleasure of inviting you to attend the conference at IIT Guwahati. This conference intends to present a unique spectrum of scientific programs on the most recent and exciting developments in Biotechnology, with focus on related cross-fields research and developments. The Conference is expected to display the numerous breakthroughs and significant developments in the selected thematic areas and their relevance to the welfare of mankind.

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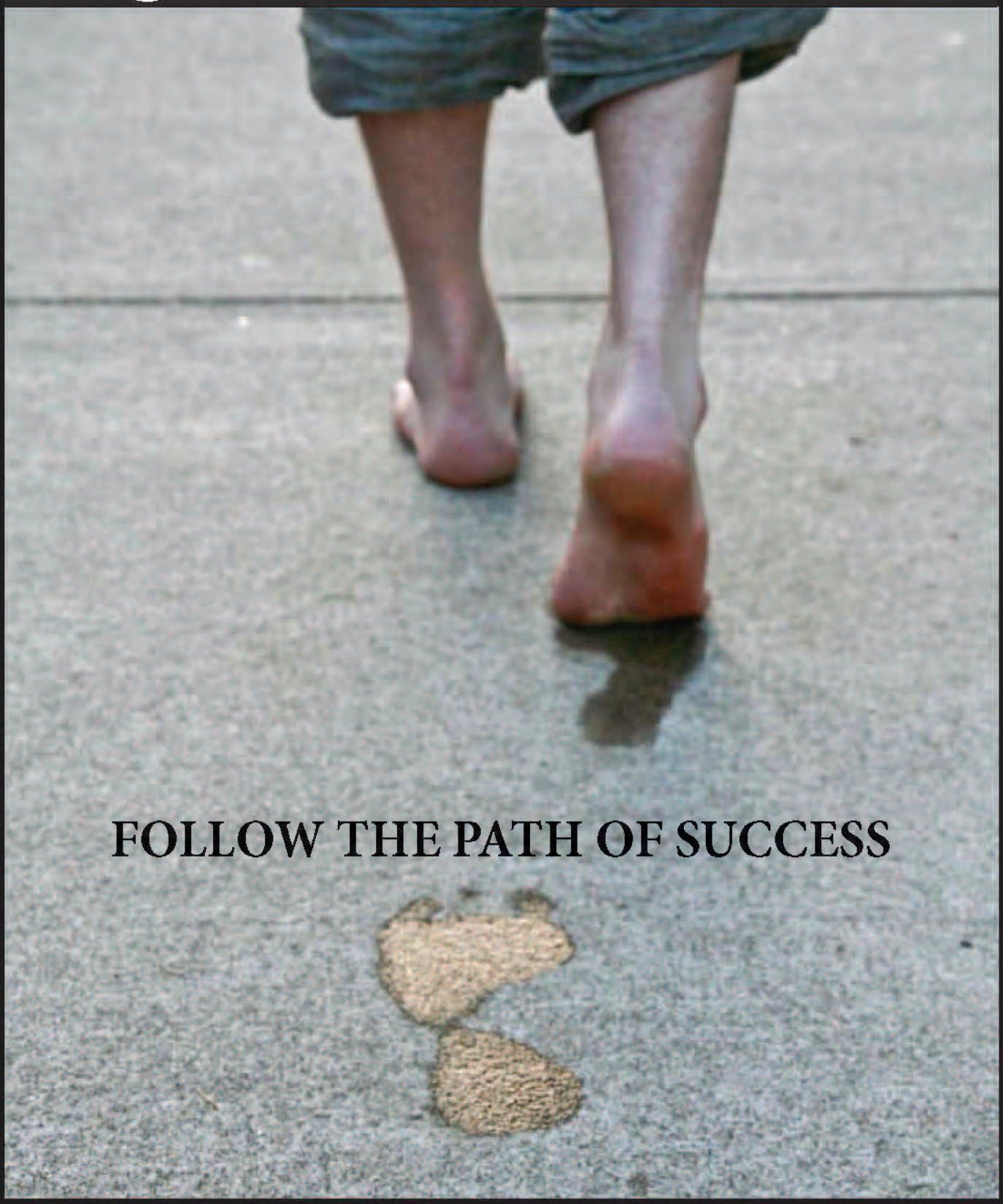

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by Kamal Pratap Singh

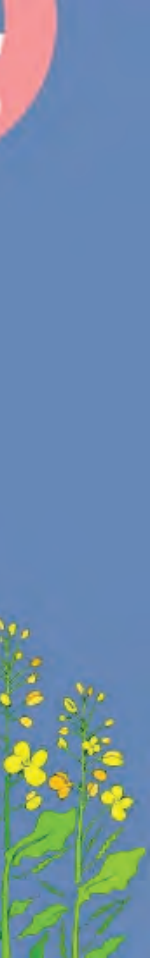
The two sides of India's first edible GM crop Dhara Mustard Hybrid (DMH 11) approval

Paving the way for commercial release of indigenously developed genetically modified (GM) mustard, the central regulator — Genetic Engineering Appraisal Committee (GEAC) — has approved "environmental release" of the transgenic mustard (DMH-11) for seed production and testing in last week of October 2022. While scientists welcomed the GEAC decision, the critics described the permit as "lack of responsible regulation." "Nothing has changed from 2017 when GEAC gave its approval to GM mustard commercial cultivation, but the decision was not cleared by the competent authority i.e. Minister," said Kavita Kurugranthi from the Coalition for a GM Free India.

If we talk about yield, DMH-11 yields 28 percent more than national check varieties and 37 more than regional checks, according to senior government officials.

These lines and the hybrid were developed at the **Centre for Genetic**

GM mustard hybrid DMH-11 and its parental lines Varuna bn 3.6 carrying the barnase and bar genes and EH-2 modbs 2.99 carrying the barstar and bar genes that makes these varieties resistant to insect damage.



Manipulation of Crop Plants (CGMCP) and the **Department of Genetics** located at the South Campus of the University under the stewardship of Prof. Deepak Pental (currently SERB National Science Chair), the then Professor at the Department of Genetics and a former Vice Chancellor of DU. The hybrid and the parental lines were developed indigenously and covered by National and International patents.

This is the second GM crop after Bt. cotton to get environmental clearance in India and the first GM food crop to be approved. This landmark approval paves the way for hybrid mustard which has ~25-30% higher yield, to reach the farmer's field within an estimated period of 2-3 years. This acceptance is also a positive step toward recognition of genetically engineered crop as a measure for food security.

Mustard is cultivated by around six million farmers in around seven million hectares across Rajasthan, Haryana, Punjab and Madhya Pradesh. There is a compelling need to grow GM mustard, considering that the traditional varieties in India offer low yields—less than 1,200 kilos per hectare—while the global average is 2,000-2,200 kilos per hectare.

"In 2021-22, India imported 14-14.5 million tonnes of edible oil costing a record foreign exchange outgo of $18.99 billion (about Rs 1.5 lakh crore) to meet almost 70 per cent of domestic edible oil requirement amidst abysmally low yield and production of oilseed crops," said Bhagirath Choudhary, founder director of South Asia Biotechnology Centre.

Approval was welcomed by many scientists, ICAR director Ashok Kumar Singh says it will lead to finding a science-based solution to the challenge of high import of edible oils and allow the development of more high-yielding hybrids. "Given India's huge population, we need to increase food production. Technology must be used for this," said Hannan Mollah, general secretary of the left-wing All Indian Kisan Sabha (AIKS). "However, control of the technology should remain with the government and public sector and extensive testing of the hybrid seed must be done by ICAR. The government should allow its cultivation if the tests establish that hybrid seeds are not harmful and help in increasing yield."

Not all are satisfied with approval, the RSS-affiliated Swadeshi Jagran Manch (SJM) and Bharatiya Kisan Sangh (BKS) as well as groups of green activists continue to oppose GM crops. In a letter to Union minister for environment, forest and climate change Bhupender Yadav, the SJM accused the GEAC of func-

What is GM Mustard?

DMH-11 is an indigenously developed transgenic mustard. It is a genetically modified variant of Herbicide Tolerant (HT) mustard.

DMH-11 is a result of a cross between Indian mustard variety 'Varuna' and East European 'Early Heera-2' mustard.

It contains two alien genes ('barnase' and 'barstar') isolated from a soil bacterium called Bacillus amyloliquefaciens that enable breeding of high-yielding commercial mustard hybrids.

Barnase in Varuna induces a temporary sterility because of which it can't naturally self-pollinate. Barstar in Heera blocks the effect of barnase allowing seeds to be produced.

DMH-11 has shown approximately 28% more yield than the national check and 37 % more than the zonal checks and its use has been claimed and approved by the GEAC.

"Bar gene" maintains the genetic purity of hybrid seed.

Photo: Prof Deepak Pental (left) with Prof Ashok Pradhan (middle), scientist behind GM Mustard development at UDSC, Delhi.

tioning in an 'irresponsible fashion' and termed the claims made in support of GM mustard as 'completely untrue, unsubstantiated and wrongly projected.'

"The Swadeshi Jagran Manch has all along been opposing this dangerous and unneeded GM mustard being brought in through the back door as a public-sector GMO," SJM national co-convenor Ashwani Mahajan stated in the letter. He termed as 'completely untrue' the claim that GM mustard was 'swadeshi'. "We are confident that as a person who has carefully studied the adverse impacts of GM crops and also published opinion pieces on it in the past, you will intervene immediately and ensure that no GM mustard seed is allowed to be planted now or ever," Mahajan said in the letter.

The BKS wants Yadav to direct the GEAC to withdraw its recommendation. Its argument is that GM mustard poses a health hazard and could cause cancer. BKS all India general secretary Mohini Mohan Mishra said the GEAC, in its study, had claimed that GM mustard was herbicide-tolerant. Mishra alleged that the HT technology was mostly carcinogenic and that the GEAC had not been able to resist the entry of unwanted and unsuccessful (high investment) GM food crops into the farming system and food chain of India.

The Coalition for GM-Free India, a network of anti-GMO organisations and individuals, said the GEAC approval was shocking and alleged that the regulator and crop developers had colluded to circumvent bio-safety assessments. Kavitha Kuruganti, a member of the Coalition for GM-Free India, reminded Minister Bhupender Yadav that he had himself written against GM crops in the past.

Deepak Pental, 71, the man behind genetically modified (GM) mustard, said that the technology behind GM mustard was "safe and effective". Pental told in an interview: "There is need to cut through the haze (on transgenic technologies) and take a tough stand. You can either take a hard decision or kill something by taking no action." The professor and biotechnologist called the approval a "big leap for the country"

in view of India's dependence on costly edible oil imports of up to 60% of domestic demand.

Genetic-technology backers have hailed GM mustard as proof of home-grown scientific prowess. However, activists opposing transgenic technologies alleged that GM mustard was cleared by overlooking "big concerns over environmental safety". A concern is that little is known about how it may impact honey bees, said the Coalition for a GM-Free India, a body of anti-GM outfits.

"The genes used in GM mustard have been deregulated in countries such as Canada, US and Australia, which are all big producers of honey. No study anywhere has shown any adverse impact of GM crops on pollinators," Pental said.

Bees are life-sustaining pollinators. There are concerns that GM crops can impact bees in many ways. One of them is by changing their eating and foraging patterns. GM technologies that give crops the ability to resist and kill pests can potentially do the same to bees, anti-GM advocates say.

"There is concern that genetically modified plants might induce adverse effects on pollinators either directly or indirectly via reduced food availability," states a 2021 paper "Biosafety of bee pollinators in genetically modified agro-ecosystems: Current approach and further development in the EU" by researchers at Italy's ENEA Research Centre of Trisaia.

The biotech regulator has ordered field studies on impact on bees from GM mustard but only during commercial cultivation of GM mustard over the course of next two years.

Event

Current Science Online Workshop on Science Writing

Current Science has been organizing a series of training workshops on science writing for the benefit of scientists, researchers and science faculty in India from 2016.

Due to the COVID-19 pandemic, the workshop series was re-designed to be conducted online. The third online workshop on science writing will start on 25 December 2022 and end on 26 March 2023.

The workshop aims to enhance the capacity of scientists and researchers to write different types of scientific articles, reviews, grant applications and project reports. Indian citizens with a Ph.D. degree in any branch of science or at least two scientific papers in peer-reviewed journals may apply.

Applications are invited from interested faculty in Indian universities and scientists in Indian research institutes.

Selected participants are expected to take active part in the 60–90 minutes online video sessions on Saturdays and Sundays. During the weekdays, there will be group e-mail discussions on issues related to science and writing, activities and exercises requiring about 15 minutes from the participants, at their own convenient time.

This is not a course to merely attend, but a workshop where the work of writing publication worthy science is done by the participants. To allow group discussions, interpersonal interactions, hands-on training, feedback and mentoring, only 20 persons will be selected for the workshop.

Registration fee: Rs 5000 to be paid on selection.

Application form and the details of the workshop are available at: https://forms.gle/SRsK4wnRPHdpyh9BA

Last date for application: 10 December 2022

Featured Biotech News

80% of Patients in Investigational Breast Cancer Vaccine Trial Alive after 10 Years

Nov 08, 2022

Researchers from the University of Washington School of Medicine have developed an investigational vaccine that can safely elicit an immune response against the HER2 protein, a key marker in breast cancer. Rather than preventing breast cancers from developing, this immunization approach instead primes the immune system to launch a much stronger offensive against the tumor.

The findings, which came from a single-arm Phase I trial of 66 patients diagnosed with HER2-positive breast cancer. were published last week in JAMA Oncology. In the 66 inoculated patients, the majority of vaccine-related toxicities were mild, classified as either grade 1 or 2 in the third version of the Common Terminology Criteria for Adverse Events.

Side effects included redness and swelling at the injection site and some fever, chills and flu-like symptoms, Disis said.

Recruitment for the UW Medicine trial started more than 20 years ago, in 2001, and culminated in 2010. Afterward, participants were followed for ten more years to assess post-vaccine toxicities.

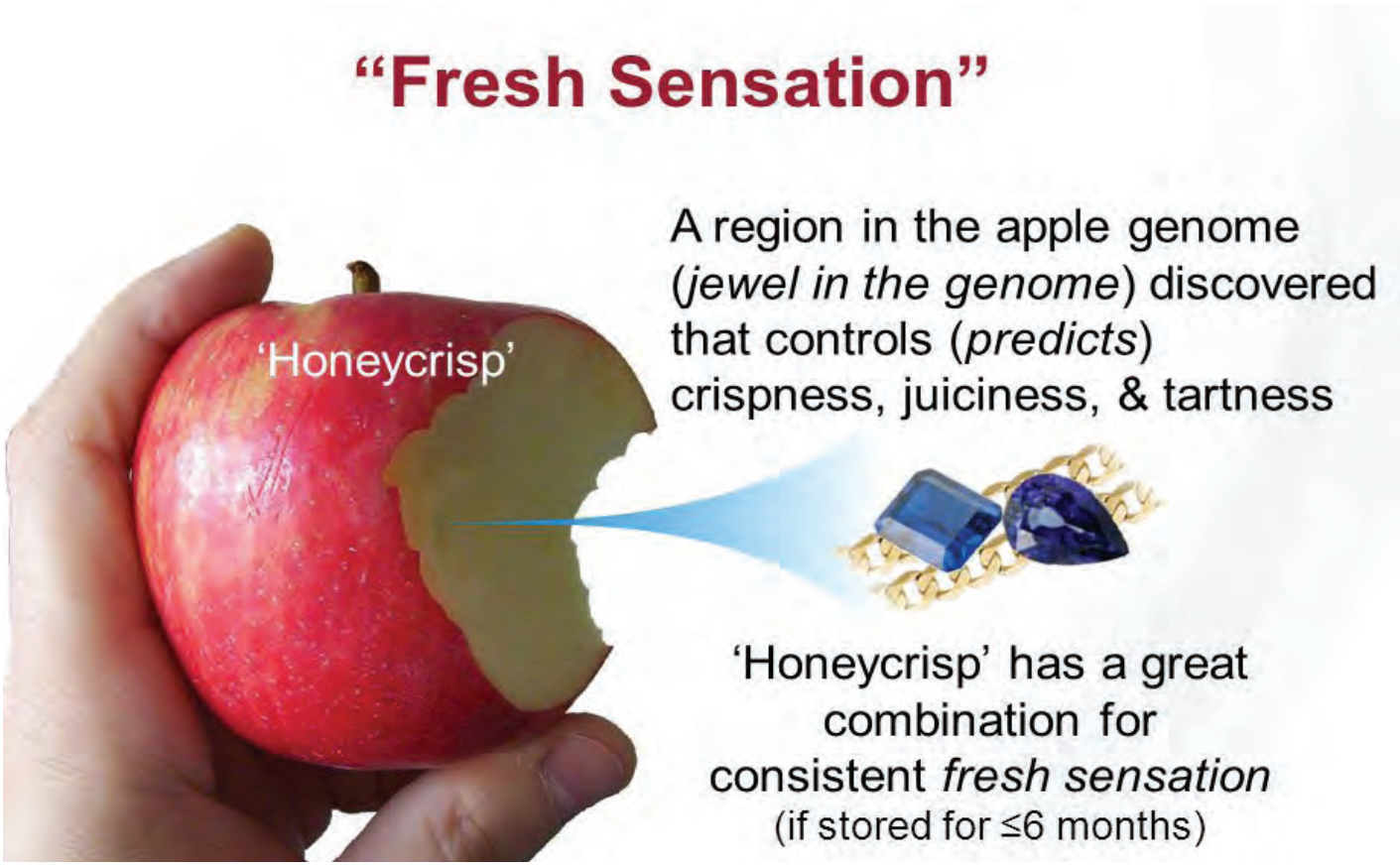
Those who had been inoculated with the 100-µg and 500-µg demonstrated significantly stronger type 1 immune response against the HER2 intracellular domain at most of the assessment time points, compared with the 10-µg shot. After controlling for baseline factors, the difference in response had p-values of 0.003 and lower than 0.001, respectively.

"We've now followed these women for ten years and 80% of them are still alive," Disis said, cautioning that the study's findings remain preliminary and that drawing definitive conclusions about vaccine response and patient survival would be premature at this point.

UW Medicine researchers have already initiated a larger Phase II trial, pitting their investigational vaccine against an active comparator. Enrollment for this study is ongoing and has more than 100 participants.

The investigational vaccine is based on a short stretch of DNA which, when injected, is taken up by cells in the vicinity. In turn, the cells translate these DNA fragments to produce the specific part of the HER2 protein found inside cells, which they then present to the immune system. This intracellular HER2 domain triggers a much stronger cytotoxic response than the protein's extracellular parts.

Scientists Sequence Honeycrisp Apple Genome



November 2, 2022

A team of researchers from the United States has sequenced the Honeycrisp apple genome, which provides a valuable resource for understanding the genetic basis of important traits in apples and other tree fruit species, which can be used to enhance breeding efforts.

According to Awais Khan, associate professor in the School of Integrative Plant Science at Cornell AgriTech and the first and co-corresponding author of the paper in Gigabyte, growing Honeycrisp can be challenging. "Although it has many positive traits, it's one of the most difficult apple cultivars to grow in the production system in orchards; it suffers from many physiological and post-harvest issues," he said.

On their own, Honeycrisp trees have difficulty getting enough nutrients and require a specific nutrient management program for good yields and health, Khan said. Without such management, the trees commonly develop "zonal leaf chlorosis," where leaves turn yellow and curl due to carbohydrate and nutrient imbalances. Honeycrisp apples are also susceptible to disorders such as bitter pit, due to calcium imbalances, and bitter rot, a fungal infection. Such issues are fundamentally genetically controlled, though improper handling and post-harvest storage can make them worse.

Genetic sequencing technology made it possible to sequence, assemble, and publish the Honeycrisp genome in a short time. Using advanced methods, the Honeycrisp genome covered 97% of all the protein-coding genes. By comparison, the 2010 Golden Delicious genome assembly only covered 68% of the genes.

Biocon ranks No. 8 in 'Global Top Employers' by Science magazine

November 1, 2022

The company has been ranked 8th on the list this year for three key attributes: 'innovative leader in the industry', 'is socially responsible' and 'has loyal employees'

Leading biopharmaceuticals company, Biocon Limited has been named among the Top 10 employers in the global biotech, pharma and biopharma sector by the prestigious US – based Science magazine.

Biocon has been ranked 8th on the list this year for three key attributes: 'innovative leader in the industry', 'is socially responsible' and 'has loyal employees.'

Employees across Biocon and Biocon Biologics participated in the Top Employers Survey conducted by Science magazine. This marks the tenth consecutive time that Biocon has been included in the journal's prestigious annual global ranking. The company ranked ahead of pharma & biotech majors such as Vertex, Merck, Genentech, GSK, Abbott, Roche, Novartis, etc. this year.

Biocon Group prides itself on a meritocratic and value-driven culture, which is appreciated by its over 15,000- strong workforce.
Kiran Mazumdar-Shaw, Executive Chairperson, Biocon & Biocon Biologics said, "We are pleased to be recognized amongst the Top 20 Global Employers by the prestigious Science magazine for the 10th consecutive year.

This year's rank of No. 8 for Biocon Group reflects the passion of our people to make a lasting impact on global health. We have always focussed on creating a workplace culture that encourages ideation, collaboration and experimentation. This culture, which is fully aligned with the organization's vision and values, enables our employees to achieve their full potential through innovative thinking and a sense of unwavering purpose.

This global ranking is a recognition of the quality of our talent pool and their commitment towards serving patients through innovative science."

The survey shows that top employers pursue a systematic approach to professional development and advancement, as well as recognize that to attract the best scientific talent, they need to create a space for creativity, exploration, and innovation.

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Covid vaccine makers to dump 350 million doses after poor booster uptake

November 9, 2022

Hundreds of millions of unused Covishield and Covaxin vaccines will expire soon, resulting in massive losses to manufacturers Serum Institute of India (SII) and Bharat Biotech.

According to people aware of the matter, poor uptake in India has led to the wastage.Biocon has been ranked 8th on the list this year for three key attributes: 'innovative leader in the industry', 'is socially responsible' and 'has loyal employees.'

Serum Institute said around 100 million doses are set to be dumped and Bharat Biotech will junk 250 million doses.

Both companies have stopped production of covid-19 vaccines.

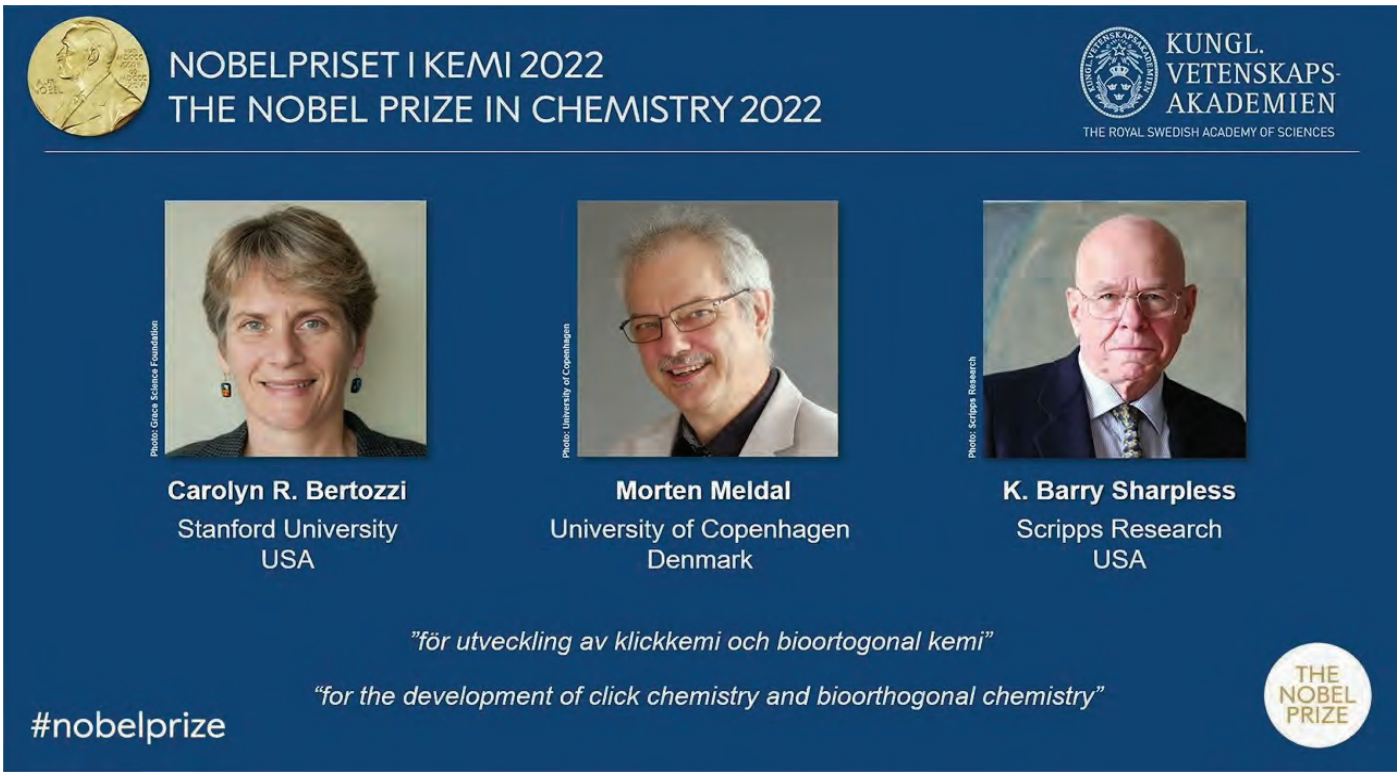
"The company has already stopped the production of Covishield vaccine due to poor demand of vaccine. We have around 100 million doses. Some of the vaccine's doses have expired and some are near expiry," said a person familiar with the matter requesting anonymity adding that the production of Covovax however will continue as per requirement.

Serum Institute of India has supplied over 1.9 billion doses of Covishield vaccines globally so far.

"Bharat Biotech has more than 200 million doses of Covaxin in bulk form and around 50 million doses in vials ready to use. Due to lack of product demand, production stoppage of Covaxin was initiated several months ago, earlier this year. Covaxin doses in vials are set to expire during early 2023, resulting in losses for the company," a Bharat Biotech spokesperson said.

"Vaccine fatigue is very prevalent in the world now, especially in India. Now people are thinking that covid is like common cold and there is no need of vaccination. There is a lot of misinformation on social media regarding vaccines, such as children developing liver failure and liver clots and people dying of vaccine," said Dr Shuchin Bajaj, founder director, Ujala Cygnus Group of Hospitals.

Nobel Prize 2022 in Chemistry goes to pharmaceuticals discovery



November 11, 2022

The Royal Swedish Academy of Sciences has decided to award the Nobel Prize in Chemistry 2022 to a trio- Carolyn R. Bertozzi, Stanford University, CA, USA; Morten Meldal, University of Copenhagen, Denmark; and K. Barry Sharpless, Scripps Research, La Jolla, CA, USA; for the development of click chemistry and bioorthogonal chemistry.

Barry Sharpless, who is now being awarded his second Nobel Prize in Chemistry, started the ball rolling. Around the year 2000, he coined the concept of click chemistry, which is a form of simple and reliable chemistry, where reactions occur quickly and unwanted by-products are avoided.

Shortly afterwards, Morten Meldal and Barry Sharpless, independently of each other, presented what is now the crown jewel of click chemistry: the copper catalysed azide-alkyne cycloaddition. This is an elegant and efficient chemical reaction that is now in widespread use. Among many other uses, it is utilised in the development of pharmaceuticals, for mapping DNA and creating materials that are more fit for purpose.

Carolyn Bertozzi took click chemistry to a new level. To map important but elusive biomolecules on the surface of cells – glycans – she developed click reactions that work inside living organisms. Her bioorthogonal reactions take place without disrupting the normal chemistry of the cell.

These reactions are now used globally to explore cells and track biological processes. Using bioorthogonal reactions, researchers have improved the targeting of cancer pharmaceuticals, which are now being tested in clinical trials.

IISc build world's first 3D printer for implant grade silicone

November 14, 2022

Bengaluru-based startup Prayasta 3D Inventions has developed the world's first 3D printer for implant-grade silicone and is partnering with the Centre for BioSystems Science and Engineering (BSSE) at the Indian Institute of Science (IISc). A Memorandum of Understanding (MoU) was signed to formalise this partnership earlier this year.

Prayasta's specialised 3D printer, Silimac, can directly 3D print implant-grade silicone material to make an implant within the hospital itself. 3D printing allows personalisation of implants on a one-to-one basis which not only improves outcomes of the surgeries for the patients but also reduces the average time a surgeon must spend for achieving the same results using standard implants.

Prayasta and IISc will work together to accelerate the translation of personalised soft tissue implants from research to hospitals, to test the 3D printability of novel materials in a fast-track mode and also to develop the necessary skills for faster market penetration of 3D printing technology.

Vikas Garg, Cofounder, Prayasta stated, "Silicone is one of the best implantable materials today and yet not 3D printable. Conventional printers cannot handle implant-grade silicone due to its inherent two-part requirement for cross-linking, form factor and extremely high viscosity. That is why, we have taken a fresh approach and developed a novel 3D printing technology from scratch."

India's first national repository for life science data set up at Faridabad

November 14, 2022

Union Minister of State (Independent Charge) Ministry of Science and Technology, Dr Jitendra Singh dedicated to the nation India's first national repository for life science data, 'Indian Biological Data Center' (IBDC) at Faridabad, Haryana.

Speaking on the occasion, Dr Jitendra Singh said, as per the BIOTECH-PRIDE guidelines of the Government of India, IBDC is mandated to archive all life science data generated from publicly funded research in India.

Supported by the Department of Biotechnology (DBT), it has been established at Regional Centre of Biotechnology (RCB), Faridabad with a data 'Disaster Recovery' site at National Informatics Centre (NIC), Bhubaneshwar.

It has a data storage capacity of about 4 petabytes and houses the 'Brahm' High Performance Computing (HPC) facility. The computational infrastructure at IBDC is also made available for researchers interested in performing computational-intensive analysis.

Dr Jitendra Singh informed that IBDC has started nucleotide data submission services via two data portals viz. the 'Indian Nucleotide Data Archive (INDA)' and 'Indian Nucleotide Data Archive – Controlled Access (INDA-CA)' and has accumulated over 200 billion bases from 2,08,055 submissions from more than 50 research labs across India.

It also hosts an online 'Dashboard' for the genomic surveillance data generated by the INSACOG labs. The dashboard provides customized data submission, access, data analysis services, and real-time SARS-CoV-2 variant monitoring across India. Data submission and access portals for other data types are under development and would be launched shortly.

Kiran Mazumdar Shaw honored with H.K. Firodia Lifetime Achievement Award 2022

October 23, 2022

Kiran Mazumdar-Shaw, Executive Chairperson of Biocon and Biocon Biologics has been awarded the H.K. Firodia Lifetime Achievement Award 2022 for Excellence in Science & Technology by the H.K. Firodia Memorial Foundation on the 25th anniversary of the award.

The H.K. Firodia Awards Selection Committee unanimously decided to confer the Lifetime Achievement Award to Mazumdar-Shaw for her monumental contributions as a global leader in biotechnology innovation and entrepreneurship.

On receiving the award, Kiran Mazumdar-Shaw said: "I feel extremely privileged and humbled to be recognised for my lifetime efforts in building Biocon to be a responsible and empathetic biotech company that is driven by the purpose of delivering affordable access to essential medicines.

As a scientist, I was inspired by the vision of creating an organisation that leverages science & technology to widen access to lifesaving drugs for patients on the lowest rung of the economic ladder. It is through our philosophy of affordable innovation that we have been able to make a difference to global health equity by ensuring that no patient anywhere in the world is denied essential and lifesaving biologic drugs on account of affordability."

As the chief guest at the awards ceremony held in Pune, Ms Mazumdar-Shaw felicitated two more leading women in science. She presented the H.K. Firodia Vijnan Ratna Award to Dr Gagandeep Kang, eminent virologist and Professor of Microbiology in the Department of Gastrointestinal Sciences at the Christian Medical College (CMC) in Vellore; and the H.K. Firodia Vijnan Bhushan Award to Dr. Tessy Thomas, distinguished scientist and Director General, Aeronautical Systems, Defence Research and Development Organisation (DRDO).

The Awards Selection Committee comprised of distinguished personalities like Dr. R.A. Mashelkar, Dr. Anil Kakodkar and Dr. Vijay Bhatkar.

The H.K. Firodia Award was instituted in 1996 in memory of the Late H.K. Firodia, who is considered the doyen of the Indian automobile industry.

NTU Singapore Scientists Genetically Engineer Plants to Increase Oil Content

November 16, 2022

Scientists from Nanyang Technological University (NTU) Singapore have successfully genetically modified an important plant protein responsible for the accumulation of oil in plant seeds and edible nuts. The research team showed that their patent-pending method can increase the oil content in seeds by 15 to 18 percent.

The scientists discovered that the secret to helping plants accumulate more oil in their seeds is in one of their proteins called WRINKLED1 (WRI1). Scientists have known for over two decades that WRI1 plays an important role in controlling plant seed oil production. Now for the first time, a high-resolution structure of WRI1 has been imaged and reported by the NTU-led team. The team detailed the molecular structure of WRI1 and how it binds to plant DNA – which signals the plant on how much oil to accumulate in its seeds.

In experiments to observe how the modified WRI1 affects oil accumulation, both the modified protein and the unmodified form were injected into Nicotiana benthamiana leaves, and an analysis of triacylglycerol (a major form of dietary lipid in fats and oils) levels was carried out.

The results showed that the modified WRI1 protein generated more significant spikes in triacylglycerol production compared to the control plant introduced with the WRI1 unmodified form. Subsequent experiments showed that the oil content in the seeds of the modified Arabidopsis thaliana contained more oil than the unmodified form. The offspring of this GM plant will also bear the same modified WRI1 protein and produce more oil in their seeds.

The research team hopes that this innovation can help the world in its quest for sustainability, helping to reduce the amount of arable land needed for oil-yielding crops while increasing the yield to meet the world's growing demand for vegetable oil, especially when facing the effects of climate change.

President of India inaugurates supercomputing facility for disease prediction at IIT-Guwahati

October 25, 2022

838 Teraflops PARAM KAMRUPA is a state-of-the-art Supercomputer facility set up at IIT Guwahati under National Supercomputing Mission - a joint initiative of the Ministry of Electronics and Information Technology and the Department of Science and Technology

President of India Droupadi Murmu visited Indian Institute of Technology (IIT) Guwahati campus on Thursday 13th October 2022 during her visit to Assam. She inaugurated Supercomputer facility Param-Kamrupa and laboratory for the design and development of high power microwave components at IIT Guwahati.

She also inaugurated the Medical College and Hospital at Dhubri and laid the foundation stones for two Zonal Institutes of National Institute of Virology (NIV) at– (i) Dibrugarh, Assam and (ii) Jabalpur, Madhya Pradesh on the occasion.

On the recently inaugurated facilities at IIT Guwahati, the President, said, "I am confident that the Super Computer PARAM-KAMRUPA facility inaugurated at IIT Guwahati will be put to use in the best possible manner to broaden our understanding and knowledge on various technological topics. The SAMEER laboratory will enable R&D assisted critical applications in defence sector and other industries. The massive effort by the State government to establish multiple medical colleges across Assam will ensure that the gap in the doctor-population ratio will be bridged significantly and it will open doors for medical research, especially for the treatment of cancer as well as other non-destructive testing."

Governor of Assam, Prof Jagadish Mukhi said, "The Supercomputing facility inaugurated at IIT Guwahati shall be utilized for large data analysis, solve complex calculations related to disease prediction and analysis, quantum computing, artificial intelligence, drug delivery studies, and contribute significantly in nation building."

Prof. Ajay Sood launches Bengaluru Science & Technology Cluster

November 16, 2022

The Bengaluru Science and Technology Cluster (BeST) cluster was formally launched at the plenary session of the Bengaluru Tech Summit, 2022, by the Honourable PSA, Prof. Ajay Sood, in the presence of Prof. G. Padmanabhan (ex. Director of IISC) and Shri S Gopalakrishnan (Kris), Co-founder, Infosys on 16th November 2022.

During the launch, Prof. Sood emphasized that Bangalore has enormous technological potential and that Karnataka State is among the leaders in science and technology advancements. He anticipates that the Bangalore cluster will succeed and pave the path for future success.

A science and technology cluster is a collaborative ecosystem in a city or a region, in which scientists, engineers, social scientists, and entrepreneurs working in academia, government labs, and industry identify and collaborate to solve some socially relevant problems.

Science & Technology (S&T) Clusters are being established as formal umbrella structures for S&T organizations in various cities to work together more effectively while retaining their autonomy. On the recommendation of the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC) to build an Atmanirbhar Bharat through S&T, the O/o PSA supports these initiatives.
The Bengaluru Science and Technology Cluster (BeST), the latest in this set of O/o PSA supported clusters, has identified Health & Wellness, Urban Life, and Futuristic Technologies as its core sectors and has set up teams to work on areas of One Health, Digital Health, Precision Agriculture, Urban Transportation, Monsoon & Climate Change, Quantum Technologies, Active Matter & Robotics and Jet Engine.

As Prof Sood explained, the BeST Cluster is envisaged as a platform of active collaboration for the entire R&D ecosystem in Bangalore cutting across disciplines and mandates but retaining their individual autonomy. A Section 8 company is being set up to catalyse this collaboration as an independent body, provide organizational support and raise and manage resources.

The earlier S&T Clusters in this program have been set up in Pune, Jodhpur, Delhi-NCR, Bhubaneshwar and Hyderabad.

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Department of Biotechnology Ministry of Science and Technology Government of India

CEPI's Open Calls for Proposals

The Coalition for Epidemic Preparedness Innovations (CEPI) is a global alliance between public, private, philanthropic, and civil society organizations to accelerate the development of vaccines against emerging infectious diseases and enable equitable access to these vaccines for affected populations during outbreaks.

In partnership with CEPI, Department of Biotechnology (DBT), initiated the implementation of the Ind-CEPI Mission entitled "Epidemic preparedness through rapid vaccine development: Support of Indian vaccine development aligned with the global initiative of the Coalition for Epidemic Preparedness Innovations (CEPI)".

From time to time, CEPI issues calls for proposals inviting applicants to submit funding proposals for projects to develop specific vaccine candidates or research that can directly support vaccine development.

CEPI has recently issued the following Calls for Proposals:

RNA vaccine platform technologies and vaccine library development against emerging and select endemic infectious diseases, Focus Area-2 (open until December 31, 2022)

Innovative technologies to improve vaccine thermostability (open until December 31, 2022)
State-of-the-Art Immunogen Design using Computational Antigen Simulation Technologies for Vaccine Development Against Emerging Infectious Diseases (open until July 31, 2022).

The Department of Biotechnology solicits participation of Indian scientists/vaccine developers, for submission of applications to CEPI under the call. Kindly visit the CEPI website for more information related to these calls and guidelines: https://cepi.net/get_involved/cfps/

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

ANNOUNCES THE CALL FOR LETTER OF INTENT UNDER "BIOTECHNOLOGY CAREER ADVANCEMENT AND RE-ORIENTATION PROGRAMME FOR WOMEN SCIENTISTS"

BioCARe

To enhance the participation of Women Scientists in Biotechnology Research, the Department of Biotechnology invites the **Letter of Intents (LOIs) under the BioCARe scheme for Women Scientists upto age of 55 years**. The programme is targeted towards Career Development of unemployed/not in regular position women scientists. The scheme is open for following areas of Biotechnology- Animal and Marine Biotechnology; Bioengineering and Biomaterials; Medical Biotechnology; Environmental Biotechnology and Bioenergy & Plant and Agriculture Biotechnology and allied areas. The duration of the project will be maximum 3 years.

The research support will be provided only to women scientists (unemployed/not in regular position) for **whom this is the first extramural research grant** (**Women Scientists who have received any earlier grant from any Government Funding Agency as Principal Investigator are not eligible**).

Interested women candidates may submit a Letter of Intent through e-PROMIS portal of the Department (https://dbtepromis.nic.in). For further assistance contact the Processing and Management Unit (PMU) established at International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi managing the programme on the behalf of Department of Biotechnology. The 5 hard copies of the LoI may also be submitted to the PMU.

Contact Details:

DBT-BioCARe ICGEB PMU
International Centre for Genetic Engineering and Biotechnology
Aruna Asaf Ali Marg, New Delhi - 110 067
Email: biocarepmu@icgeb.res.in
Tel: +91-11-26741358/1007 (Extension: 470)

Details of the scheme -guidelines are at DBT website **https://dbtindia.gov.in** and LoI is at https://dbtepromis.nic.in.

Last Date for Submission of LOI – 24th December, 2022

Indian Academy of Sciences, Bengaluru
www.ias.ac.in

Indian National Science Academy, New Delhi
www.insaindia.res.in

The National Academy of Sciences, India, Prayagraj
www.nasi.nic.in

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SCAN TO APPLY

1ST ANNOUNCEMENT

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Building Cytometry Community

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"Flow Cytometry and its Applications in Biological, Clinical, Pharmaceutical, Plant and Veterinary Sciences"

1st -7th February 2023

Organized by
Trust for Education and Training in Cytometry (TETC), India
In collaboration with
Gujarat Biotechnology Research Centre (GBRC), Gujarat
Indian Institute of Technology-Gandhinagar (IIT-Gn), Gujarat
National Institute for Pharmaceutical Educational and Research - Ahmedabad (NIPER-Amd)
Kamdhenu University, Gujarat

HIGHLIGHTS

Basics of Flow Cytometry, Quality Control and Assurance (QC & QA) Multicolour Panel Designing, Compensation, Flow Cytometry Sample Preparation, Cell Cycle, Cell Signalling, Apoptosis, Proliferation, Microbial Flow Cytometry, Small Particle Analysis, Stem Cells Characterization, Cell Sorting, Clinical Flow Cytometry (Leukaemia/Lymphoma, PID, MRD), Flow Cytometry Applications in Veterinary Sciences, Flow Cytometry Applications in Pharmaceutical Sciences, Plant Flow Cytometry, Data Analysis and Presentation

INVITED FACULTY

INTERNATIONAL

Paul Wallace, USA
William Telford, USA
Brent Wood, USA
Rui Gardner, USA
Zosia Maciorowski, France
Derek Davies, UK
Deniz Gunnur, Turkey

NATIONAL

Rekha Gour
H. Krishnamurthy
Sumeet Gujral
Prashant Tembhare
Deepak Sharma
Vikas Shrivastava
KG Tirumurugaan
Hemant Agrawal
Vivek Tanavde
Himanshu Tillu
P.G. Subramanian
Kunal Sehgal
Badri Narayan
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Mark Your Dates

XL ANNUAL MEETING OF
INDIAN ACADEMY OF NEUROSCIENCES
(DECEMBER 8 - 10, 2022)

PRE-CONFERENCE WORKSHOP: DECEMBER 7, 2022

DEPARTMENT OF BIOMEDICAL ENGINEERING, SCHOOL OF TECHNOLOGY
NORTH-EASTERN HILL UNIVERSITY, SHILLONG - 793022, MEGHALAYA, INDIA

With immense pleasure, we invite you to participate in the *XL Annual Meeting of Indian Academy of Neurosciences, which will be held at North-Eastern Hill University,* Shillong one of the leading central university in the country. The conference will highlight advances in the field of neuroscience and would create awareness among young researchers to carry out research activities as well as career options in the future, so that they could offer better solution(s) on different brain disorders.

Theme: "Neuroscience Research : Current Trends and Future Needs"

Proposed Symposia

Aging and Dementia
Artificial Intelligence and Neuroscience
Brain Injury and Neuroregeneration
Drug Repurposing for Neurological Diseases
Emotion and Cognition
Neurodevelopmental disorders
Neuroglial signaling
Neuroimaging
Neurointerventions and Clinical Challenges
Neurological Disorders and Cell Therapy
Neuroprosthetics and Rehabilitation
Neuroprotection
Trends in Neurotoxicology
...any other relevant symposia also invited

Scientific Programme

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Plenary sessions
Symposia
Invited talks and Special lectures
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Poster sessions
Panel discussion

Organizing Secretary

Dr. Sudip Paul
Assistant Professor & Teacher In-Charge
Department of Biomedical Engineering
NEHU, Shillong, India

Contact Us: ian2022.nehu@gmail.com
https://ian2022nehu.com/

Deadlines	
SUBMISSION OF PROPOSALS FOR SYMPOSIA & SATELLITE MEETINGS	AUGUST 16, 2022
EARLY BIRD REGISTRATION AND ABSTRACT SUBMISSION	AUGUST 18, 2022
ACCOMMODATION REQUEST	AUGUST 16, 2022

Biotech Industry News

Indian Immunologicals to invest Rs 700 crore in Hyderabad for new animal vaccine facility

November 2, 2022

Indian Immunologicals Limited will invest about Rs 700 crore to set up a new animal vaccine manufacturing facility in Genome Valley, Hyderabad – the "Vaccine Hub of the World", to meet the vaccine security of the nation against economically important diseases such as Foot and Mouth disease (FMD) and other emerging diseases.

The new facility will create total employment for around 750 people.

IIL, a subsidiary National Dairy Development Board (NDDB) is already one of the largest manufacturers of FMD vaccine in the world and is the leading supplier of FMD vaccine to the Government of India's National Animal Disease Control Programme (NADCP).

IIL's intended new facility, in Genome Valley Phase 3, will add another 300 million doses/annum of FMD vaccine to its capacity. The existing facility in Gachibowli already has a capacity of 300 million doses. Production is scheduled to commence in the 3rd year.

IIL is a One Health company and the market leader in veterinary and human biologicals in India. It manufactures over 150+ products.

Dr. K. Anand Kumar, MD, IIL, and other members of the Executive Leadership team of IIL including Senior Vice Presidents Mr. Mukul Gaur and Mr. NSN Bhargav met with the Minister Mr. KT Rama Rao and briefed the Minister on the company's plans.

Minister Mr. K.T Rama Rao said, "I'm delighted that Indian Immunologicals will be setting up another greenfield facility in Genome Valley. Hyderabad is already regarded as the "Vaccine Capital of the World" and this expansion further advances our contribution in terms of global health, not just for humans but also for animals".

Dr. K. Anand Kumar, Managing Director, IIL mentioned, "IIL is on an aggressive growth path and this third vaccine facility in Hyderabad will ensure self-sufficiency for our nation in the field of vaccines and thereby saving the exchequer and farmers several thousands of crores".

India's first online biofuel marketplace, Buyofuel raises Rs 11.5 crore in Pre-Series A round

November 3, 2022

Online alternate fuel marketplace Buyofuel has raised over Rs 11.5 crore in a Pre-Series A round led by Inflection Point Ventures (IPV). The round also saw participation from Venture Catalysts, LetsVenture, Lead Angels Fund, and Gruhas Proptech.

The startup has the largest supply base of quality assured-biofuels and fuel consumers, offering economic prices for wastes and biofuels. Buyer-base with buy capacity of more than 6,00,000 metric tonnes/month and Seller-base with sell capacity of more than 2,00,000 metric tonnes/month. For sellers, registering with the platform is a seamless experience as all the customers who visit the platform are 100% verified. The team at Buyofuel ensures 100% transparency with the customers, updating them with real time progress throughout the order execution. The consignment is tracked from loading to unloading point to ensure timely delivery.

Ankur Mittal, Co-founder & COO, Inflection Point Ventures says, "Biofuels are a powerful alternative fuel substitute for most of the mainstream fossil fuel options whether diesel, petrol or even CNG. Buyofuel has an ambition to scale its business and make the adoption of clean fuel options seamless and more efficient. At IPV, we are keenly watching the ESG and Cleantech segment and have made bets across different business models. We back the vision of Buyofuel founders and want to help them scale up faster."

Buyofuel is the only online marketplace for all types of quality assured biofuels and wastes with a complete digitized interface. The Company has emerged with the largest seller and buyer base in the alternate fuel category. It is helping non-renewable fuel consumers to switch to low or zero emission fuel options and helping them to cut their carbon emissions by moving to biofuels.

Buyofuel currently has over 1600 verified registered users, with a supply of biodiesel, solid biofuels and organic waste on a per-day basis. Their clients include large, reputed companies like Aditya Birla, JSW, TVS Tyres, Ramco Cements, Dalmia cements, Thermax and many others are registered users of Buyofuel. The company has recorded a monthly revenue of over Rs 2 Cr.

Kishan Karunakaran, Founder and CEO, Buyofuel says, "Buyofuel looks to mainstream biofuels as a major fuel in India's energy mix by ensuring that biofuels contribute to more than 10% of India's fuel consumption, Buyofuel's journey for a green India has been tremendously supported by IPV. IPV has continuously engaged with Buyofuel on a regular basis and has played a big part in the growth of Buyofuel. We are glad that Buyofuel got to benefit from the tremendous experience that IPV team brings with it."

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Bad Science

Journal editor in chief who published controversial Covid papers resigns

November 16, 2022

The editor in chief of the journal Food and Chemical Toxicology (FCT) has resigned with more than a year left of his term, according to an email announcing his move to colleagues.

In the email, first reproduced in Steve Kirsh's Substack newsletter, the editor, Jose L. Domingo, cited "deep discrepancies" with the journal's direction under publisher Elsevier as the reason for his early resignation. He shared the email with us when we reached out for comment.

Domingo, a professor of toxicology and environmental Health at the Universitat Rovira i Virgili in Spain, listed three main points of contention: an agreement for the journal to publish documents for the Research Institute for Fragrance Materials, which Domingo believed to be a "drag" on the journal's impact factor; FCT's recent designation as the official journal of the Chinese Society of Toxicology; and a February editorial he wrote requesting submissions "on the potential toxic effects of COVID-19 vaccines."

He wrote:

I have not any proof, just feelings, but I think that the Editorial -and its consequences, among others, with a Review-paper published in FCT that I have not allowed to retract- was the

Photo: Dr Jose L. Domingo

final nail in my coffin.

Doubtless, and based on my almost 7 years as EiC, I should highlight that the commercial interests and economic benefits are the main priority in FCT. No the quality of the papers, and the prestige of the Journal based on the IF.

About that review paper: In August we published a guest post by a group of researchers who had submitted a letter to the editor about a paper in FCT that claimed "billions of lives are potentially at risk" with Covid-19 vaccines. Their letter requested retraction of the article and detailed their reasoning, but Domingo rejected it after reviews and revisions.

In a publisher's note dated November 11th, Jagna Mirska-Gent, senior publisher of Elsevier's toxicology journals, and Jason Winkler, the publishing director for life sciences, wrote that they had accepted Domingo's resignation "with regret," and "sincerely thank him for all his commitment, hard work and dedication to the Journal."

The note continued:

The reasons for his resignation, as stated by Dr Domingo, are "my personal frustration by the decrease in the Clarivate IF, and the unpleasant and serious problems generated on my daily mood as a consequence of the e-mails/Internet regarding documents (submitted or published in FCT) on the safety of the COVID-19 vaccines."

Domingo also shared with us an email he'd sent to FCT's publishing staff at Elsevier, requesting that his name be removed from the listing of emeritus editors of the journal, because he didn't want to appear with Wallace Hayes, a former editor who Domingo said "did not act as an honest Editor."

Hayes may be familiar to Retraction Watch readers as the editor who retracted a controversial paper by Gilles Seralini on the long-term effects of the weedkiller Roundup and genetically modified maize on rats.

Domingo also serves as editor-in-chief of the Elsevier journal Environmental Research, which earlier this year republished a study that had been retracted from JAMA Pediatrics, titled "Carbon dioxide rises beyond acceptable safety levels in children under nose and mouth covering: Results of an experimental measurement study in healthy children."

When we'd asked Domingo whether the authors of the paper had told the editors of Environmental Research about the paper's history, he initially said they hadn't, and that the editors probably wouldn't have sent the paper out for peer review if they had known it had been retracted from another journal. After checking with an associate editor, however, he told us the authors had indeed explained the paper's prior publication and retraction in a message with their submission.

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