

# CSIR in Media



75 Years of

CSIR Touching Lives

News Bulletin

11<sup>th</sup> to 20<sup>th</sup> December 2018



## Can Saffron Arrest Alzheimer's? These Indian Scientists are Finding Out!

CSIR-IIIM



The very mention of Alzheimer's disease (AD) spells dread and helplessness. Rightly so, for this terminal brain disorder borders on the unknown realms; characterised by progressive damage to the brain centres, the afflicted gradually loses memory, and the ability to communicate or take care of themselves. With normalcy toppled, there is an overwhelming dependency on caregivers, which also burdens the socio-economic structure of a society. Advancing years—between ages 65-85—when cognitive abilities begin to decline—is the primary risk factor of Dementia, of which AD is the most common.

20<sup>th</sup> December, 2018

The offshoot of improved medical facilities is the growing number of the geriatric population, which sadly has increased the risk of AD. Popularly called the 'Silver Tsunami Effect', global statistics show that more than 50 million elderly are affected by dementia. According to Alzheimer's Association India, more than 4 million cases are registered, while the actual figures could be much higher. Symptoms of depression, stress, anxiety and menopause often overlap with those of AD, leading to a misdiagnosis. Unwillingness to seek help further worsens the situation.

### The Inside Story

Our brain is a tangled forest of about a 100 billion nerve cells, and all brain functions translate into tiny electrical pulses that travel within these cells. They communicate with each other via non-contact junctions called synapses (we have around a 100 trillion of them). Here, the electrical pulses activate chemicals and transfer information

through protein-like substances called neurotransmitters. This chemical process leaves behind a sticky protein residue called amyloid, fragments of which are scavenged out of the brain through a tightly wedged cellular layer called the Blood Brain Barrier (BBB), which acts as a filter to protect the brain tissue from toxins and pathogens. Another neuro-protein ‘Tau’ is responsible for building neurofibrillary tangles (thin tubular structures) to transfer nutrients inside the neurons. When AD strikes, the amyloid bits cluster to form Amyloid- $\beta$  (beta) plaques. Such clumps are hard to flush out by the BBB and turn toxic, also blocking the synaptic zones. Furthermore, defects in Tau develop, which leads to the hardening of tangles, leaving the neurons malnourished. Both these severely affect the functioning of the nerve cells, eventually killing them. As the cells die, the brain shrinks gradually, drastically diminishing the corresponding functions.

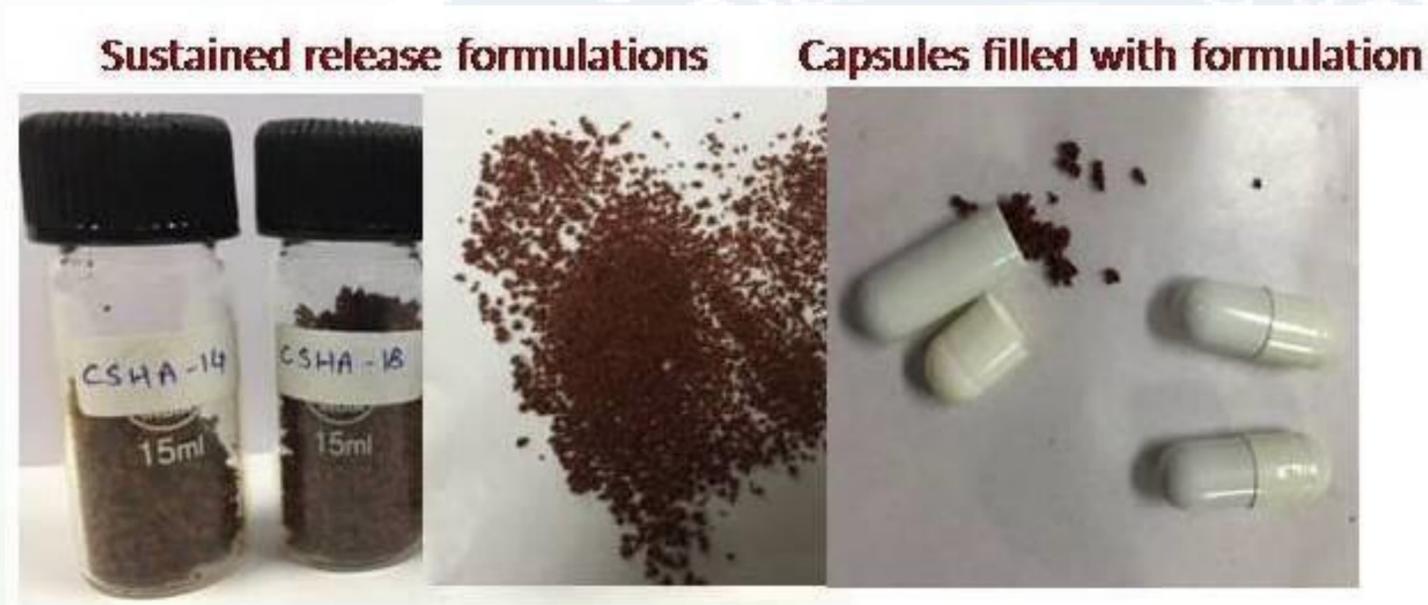
### **A Distress Call**

Along with the alarming rise of AD in the elderly, recent surveys [indicate](#) that there is a growing number of the early-onset AD. Genetic predisposition, lifestyle stress factors, and lack of active mental activities are some causes for the early onset of AD among the age group of 45-65. It is soon heading towards a global crisis, and there is an urgent need to address this medical challenge. Still an active research area, AD has no known cure currently and can only be managed. The few available drugs offer temporary symptomatic relief without the ability to arrest its progress. Scientists are working to conquer the disease and catch it before the symptoms manifest. As an answer to this troubling situation, a path-breaking discovery by scientists at the Indian Institute of Integrative Medicine (IIIM), Jammu, offers a ray of hope—a preventive and therapeutic remedy of saffron extracts has been found to arrest the onset of AD and improve cognitive health. “Five years ago, CSIR-IIIM, Jammu, started a major new initiative to discover drugs/nutritional supplements for Alzheimer’s and dementia from the knowledge base of Indian medicinal plants,” said Dr Ram Vishwakarma, Director, IIIM. After screening several natural products and their derivatives, the five-year research zeroed in on saffron (*Crocus sativus*) as the potential candidate.

## Hope in a capsule

The team of Indian scientists coordinated with their counterparts in the USA for pre-clinical studies in the genetic mice models of Alzheimer's disease. After performing systematic studies, they discovered the botanical lead candidate (having therapeutic potential) from the stigma of saffron flowers. It was labelled IIM-141.

“This product was investigated in numerous cellular and animal models to demonstrate its ability to protect the neurons and to delay the onset of Alzheimer's,” explained Dr Sandip Bharate, Senior Scientist and Project Leader, IIM.



“IIM-141 showed unique ability to enhance expulsion of toxic amyloid plaques from the brain via multiple mechanisms,” continues Dr Bharate, “And, chemicals ‘Crocine’ and its aglycone (derivative compound) ‘Crocetin’ play the critical role in this process.”

Under the expertise of Dr Sonali S Bharate, Formulation Scientist, IIM, the botanical extract was formulated into an oral capsule which contains the granules of the extract designed for a sustained release (slow releasing).

IIM-141 has bioactive compounds which induce the production of P-glycoprotein (P-gp) — the component in BBB which removes the toxins. A patent is pending for their published work.

**“We have licensed the formulation to M/s Pharmanza Herbals, Gujarat, who will introduce it as a dietary supplement in the US market soon,” adds Dr Vishwakarma.**

It will be marketed under the brand name *Saffrentine*, informed Dr Bharate. The product will reach India and South Asian markets early next year. Also, work is underway to bring the drug form of IIIM-141. “The nutraceutical will be specifically beneficial for people who are at higher risk of developing Alzheimer’s or Dementia, including the patients with early onset of disease. The product also shows excellent memory enhancing properties and has a validated safety profile,” the scientists conclude.

While we wait, we applaud the team’s relentless efforts and their beliefs in the therapeutic reserves of Indian medicinal herbs.

The team included: Yazan S Batarseh, Sonali S Bharate, Vikas Kumar, Ajay Kumar, Ram A Vishwakarma, Sandip B Bharate, Amal Kaddoumi, Gurdarshan Singh, Amarinder Singh, Mehak Gupta, and Deepika Singh.

**Published in:**  
[The Better India](#)

## Students unnecessarily getting anxious, stipends will be hiked: CSIR DG

CSIR

18<sup>th</sup> December, 2018

*Failing any decision in the matter, the students have even threatened to stage a nationwide protest on December 21.*

Shekhar Mande, the newly appointed Director General of the Council of Scientific and Industrial Research (CSIR), on Monday said the government was awaiting a final nod from the finance department to the proposal suggesting a hike in stipends of research fellows. Advertising Thousands of research students from numerous labs and research institutions under the CSIR, Department of Science and Technology and Department of Biotechnology have been demanding a hike in their fellowship stipends since July this year. Among other demands, they have sought a hike of 80 per cent from the present day pay scale — Rs 25,000 and Rs 28,000 paid to a Junior Research Fellow (JRF) and Senior Research Fellow (SRF), respectively. Failing any decision in the matter, the students have even threatened to stage a nationwide protest on December 21. Mande, who was on a day-long visit to the CSIR-National Chemical Laboratory (NCL), inaugurated five new lab facilities. Besides conducting reviews of all ongoing projects at the NCL, he also interacted with scientists and students. “There will definitely be a hike in stipends and there needs to be no doubt about it. But, there is a certain process that needs to be followed, which must remain a standard one, even for future generation of students,” Mande told The Indian Express. While a large chunk of the student community from across the country is feeling let down as the government is yet to make any decision public, the CSIR DG reassured that the government will support the future torchbearers of science, generously. “We have a fair amount of conviction that these scholars are tomorrow’s future of the country and need to be supported generously, and that is what we are doing,” he said. Asked when a decision was expected, as students were alleging a delay by the government, Mande said, “There has not really been a delay as we have been holding repeated discussions on this matter.

We have decided upon the amount to be hiked, but I cannot announce it at the moment. A certain section of students is unnecessarily feeling anxious but the government is following up the process step-by-step.” However, all hopes of hearing some positive development from the visiting DG came crashing for over 500 researchers of the institute. “We need to know by what percentage will the stipend be hiked and when it will be implemented. While we are happy the government is working on this policy but we had a lot of hope from today’s meeting,” said a researcher from the institute, who wished to remain anonymous.

In fact, stipends issued by the CSIR are among those having relatively high pendency in comparison to other research funding agencies and the matter was brought to the DG’s notice. “A software is being developed and he assured the stipends will be disbursed on time, starting January 2019,” said the student, who has stipends of a few months still due.

**Published in:**

[The Indian Express](#)

## Chakradharpur college students get exposure of R&D environment

### CSIR-IIP



NEW DELHI: The Air Force flew its first military flight, an AN-32 transporter aircraft, using blended bio-jet fuel in Bengaluru Monday, a statement said. The Experimental Test Pilots and Test Engineer from Air Force's testing establishment ASTE, flew the aircraft in a combined effort with DRDO, Directorate General Aeronautical Quality Assurance (DGAQA) and CSIR-Indian Institute of Petroleum. On July 27, Air Force Chief Marshal BS Dhanoa had announced intention to promote bio-jet fuel. Addressing a seminar on promoting indigenous technologies, Dhanoa had stated that Air Force intended to fly the AN-32

17<sup>th</sup> December, 2018 with 10 per cent bio-jet fuel during next year's Republic Day celebrations. Indian Air Force carried out extensive engine tests on the ground. This is now followed by flight trials using 10 per cent bio-jet blended ATF. "This fuel is made from Jatropha oil sourced from Jatropha oil sourced from Chattisgarh Biodiesel Development Authority (CBDA) and then processed at CSIR-IIP, Dehradun," the statement said.

In August, commercial airline Spicejet NSE 0.00 % flew country's first ever bio-jet fuel-powered flight between Dehradun and Delhi.

**Published in:**  
[Economic Times](#)

## Chakradharpur college students get exposure of R&D environment

CSIR-NML



Jamshedpur: A group of 21 students, B.Sc. 1st year, from Jawaharlal Nehru College, Chakradharpur accompanied by one teacher Prof. Arbind Pd. Pandit visited CSIR-National Metallurgical Laboratory, Jamshedpur and interacted with scientists and research scholars this morning under the aegis of Jigyasa- CSIR-NML School Interactive programme. The students were thrilled to visit the laboratory and interact with the working group. The programme was scheduled for 5 hours, which comprise CSIR & NML, Documentary film show and Laboratory visit. Dr. P.N. Mishra, Principal Scientist, welcome the students and teacher and briefed them about the programme,

15<sup>th</sup> December, 2018 discussed an overview of CSIR and NML, also explains about natural resources like ores, minerals, rocks and its value for the development of our Nation. Dr. S.K. Mandal, chief scientist and coordinator of the programme discussed about role of CSIR-NML and different functional division and units which were helped to carried out Research and Development towards gainful utilization of natural resources. Further a lab visit programme was organized to provide more exposure of R&D environment. S.N. Hembram, Sr. Technical Officer helped them during laboratory visit. Dr. J. Konar, Sr. Technical officer explained about the role of Analytical Chemistry Centre in R&D and discussed about different instruments like Atomic Absorption Spectrometer (AAS), Direct Reading Spectrometer (DRS), GAS Analyser etc. for the their application in testing and analysis of minerals, ores and metals. Soni Jha further explained, the classical methods for analysis of natural resources and also explained about the use of Muffle furnace

and Moisture Oven. Students interacted and asked number of questions and got satisfactory answer. P.K. Roy, Sr. Technical Officer, explained the role of Materials Testing & Evaluation Division and its activities, discussed about fatigue, creep, fractures prevailing in different types of industrial components. Students got exposure of different machine like Servo Hydro Testing Machine, Servo Electrical Machine and Furnace.

Dr. Ashok Kumar Mohanty, Senior Scientist explained the products which were developed by NML for the protection of metals, made up of brass, copper and silver and different alloys. He also explained the reason for discolour of metals after long exposure in the environment. Students further visited to the E-waste unit. Dr. Manish Kumar Jha explained the different process and activities pertains to the extraction of valuable metals from different electronic appliances with experimented samples. Students got excited to pursue research in e-waste area and they have asked questions and further sorted it out. Students were surprised to have glance on the 69 years' history of NML at museum and they asked different question based on sample and poster pertaining to minerals based product and facilities.

Teacher and students requested for their next visit to the laboratory to gain more knowledge. Teacher expressed his view and was satisfied to know about the consistent effort and given emphasis on research for various industrial sectors towards the development our society. At last, teacher acknowledged and extended his sincere thanks to CSIR-NML authorities for providing such nice opportunity to visit NML and observe various R & D products, facilities and their expertise in the area of minerals, metals and materials science.

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[The Avenue Mail](#)

## Mega Food Expo: Students Flock Two-Day Event At CFTRI

CSIR-CFTRI

14<sup>th</sup> December, 2018



There are special pavilions of CSIR-CFTRI (Council of Scientific and Industrial Research-Central Food Technological Research Institute), DRDO-DFRL (Defence Research and Development Organisation-Defence Food Research Laboratory) and FSSAI (Food Safety and Standards Authority of India). There is also a mobile food testing van of FSSAI at the venue. The expo from the morning is attracting students and youngsters as they are making a beeline to understand about food industry and the opportunities it provides for them in jobs or to start their own enterprises in the future.

Mysuru: A two-day Mega Food Expo as part of the Eighth International Food Convention IFCoN 2018 organised by Association of Food Scientists and Technologists (India) (AFSTI) in association with CFTRI and DFRL, began this morning at the CFTRI campus, near the North Gate, opposite to Akashavani. The food expo is open today and tomorrow from 9.30 am to 5 pm and the entry is free. There are nearly 80 industries exhibiting their products and services from different parts of the country including Karnataka, Tamil Nadu, Maharashtra, Telangana and Andhra Pradesh.



A replica of the Mysore Palace beckons the visitors to the air-conditioned pavilion and inside there is also an Ambari Elephant with the Golden Howdah and the mahout with the Durbar Hall in the background, which is attracting everyone's attention as they pose before the majestic elephant and take selfies.

There are stalls displaying cooking oils, biscuits, sweets which are diabetic-friendly where the stall in-charge persons are giving samples to taste. There are also model charts for food science students, information on extraction and distillation equipment, herbal processing machinery and on food products with CFTRI technical know-how. A stall on Swasth Bharat Yatra highlights how the yatra has completed 10,000 kms in about 50 days and is expected to conclude in New Delhi on Jan. 26, 2019. The cycle yatra was flagged off on Oct.16 on the occasion of World Food Day simultaneously from Leh, Panjim, Thiruvnanthapuram, Agartala and Ranchi. The cyclists have so far met 2.25 lakh people en route, spreading awareness on safe and healthy foods. This campaign was inspired by Mahatma Gandhi whose 150th birth anniversary is being celebrated.

The other attractions on the beautifully manicured lawns of the campus include the life-size dolls of Dollu Kunita and Mahishasura placed in front of Chittaranjan Mahal, the main office of CFTRI.

**Published in:**  
[Star Of Mysore](#)

## 25 per cent of world's hungry stay in India: Expert

CSIR-CFTRI



**Mysuru:** Recalling that 25 per cent of the hungry and malnourished population of the world was in India, and it was home to 60 per cent of women and children who were anaemic, Prof Chindi Vasudevappa, Vice Chancellor of NIFTEM, on Wednesday called for creating more awareness on eating right in the country. The V-C, who was speaking at the inaugural event of the four day International Food Convention-IFCON 2018, said even 50 per cent of the farmers who were migrating to urban areas, were not eating the right food. "With change in lifestyle, eating right matters," he stressed, suggesting that contract based

13<sup>th</sup> December, 2018

farming should be encouraged to ensure that farmers grew the food the country needed. "There are 2.8 million food technology industries in India, but only 35 to 40 per cent are in the organised sector. While the quality of food exported is monitored, there is no adequate check on the quality of food within the country. There are only around 400 food quality analysts in the country. We need more if we are to have control over our lifestyle and the kind of food supplied," he added. Speaking to reporters, Mr Pawan Kumar Agarwal, FSSAI CEO, said while some temples like Tirupati had reservations to begin with about FSSAI measures to promote safety of prasadam, now they were also covered by its licensing regime. Mr Agarwal revealed that street food vendors would not only receive training in hygiene, but also be covered under a project called the "Theme street food hub," which involved identifying a cluster of them and giving them time to improve their hygienic practices.

Over 2000 food experts, technologists, scientists and students have converged on Mysuru for a hosted by the Association of Food Scientists and Technologists (India) in association with CSIR, CFTRI, DRDO and DFRL.

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[Deccan Chronicle](#)

## The blues of the green: How can biofuel be used

CSIR-IIP



**Close on the heels of the experiment done by a SpiceJet flight using biofuel, we take a look at the scope and potential of this green fuel**

There is a long way to go before biofuel becomes a reality, but this year, a beginning was made. In August, SpiceJet operated a test flight (a Bombardier Q400 flight) from Dehradun to Delhi, which partially used biojet-fuel. The flight, which carried 28 people, used 75% of the regular ATF (aviation turbine fuel) and 25% of biojet fuel made from the jatropha plant. Biofuel is good news for human kind, as it helps the

12<sup>th</sup> December, 2018 environment and also the aviation industry, which is battling exorbitant aviation fuel prices. It is made from any plant or animal material and thus becomes an alternate energy source. While CSIR-Indian Institute of Petroleum (CSIR-IIP) is using jatropha seed oil for its biofuel, other tree-borne oils — Nahor Oil from the North-east, Sapium Oil from the Himalayan region; waste cooking oil, mustard family non-edible rotation crops are also promising feed stocks. “Green Aviation biojet-fuels contribute around 80% reduction in the carbon footprint of the aviation industry and are a potential offset for CO<sub>2</sub> emissions in the aviation industry. To meet the goals of ICAO’s (International Civil Aviation Organisation) CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation), and the demand for green fuels by international airlines, adequate availability and mechanisms for distribution of these fuels need to be made by Indian International Airports. This would make

Indian airports a more attractive hub for international airlines, who have signed the global aviation biofuels CORSIA agreement,” says Anil K Sinha of CSIR-IIP, Dehradun, that prepared the 330 kg of biojet-fuel for the flight. A senior scientist, Sinha was one of the major forces behind the research that went into the development of biofuel at IIP. In 2016, members of the Council of ICAO adopted the global scheme CORSIA, to cut down aviation emissions. According to Sinha, this widens the scope of biojet-fuel. “Right now, the scheme is voluntary till 2026, after which it will become compulsory for airlines and aircraft operators,” adds Sinha, who is positive about the current government supporting the CSIR-IIP programme. CSIR-IIP now wants to make this technology commercial and to use biofuel in actual flights, for which it is working towards scaling up and setting up a demonstration scale plant. “But the feedstock supply (non-edible vegetable oil and waste cooking oils) and its cost, put forth major economic challenges for this fuel,” says Sinha. Shell, a major oil and gas multinational, is also a distributor of biofuel. A recent press release issued by them states: The number of cars on the road is expected to rise to around 2 billion by 2050, with the amount of freight carried by trucks doubling. Shell believes low-carbon biofuels, together with gains in energy efficiency, are among the quickest and most practical ways to reduce CO<sub>2</sub> emissions from road transport in the next 20 years. According to Shell, the CO<sub>2</sub> performance of current biofuels depends on how they are produced. Ethanol made from Brazilian sugar cane, for example, produces around 70% lower CO<sub>2</sub> emissions from production to use, than petrol. The company feels that hydrogen is likely to play a role in transport in decades to come, but continues to face challenges in achieving commercial scale. “We are involved in research and have invested in a number of filling stations around the world.” NS Balamukundan manufactures 500 mt of bio-diesel in Chennai and 6000 mt of bio-diesel in Vizag, per month. He says his bio-diesel generates a 35% lesser carbon footprint, and depending on the feedstock, the percentage can go even higher. “But it is not easy to do so. The foremost challenge is technology. Most plants in India and globally do not have the technology to process waste vegetable oils. Those based on edible oils are not cost competitive, and hence lead to poor capacity utilisation.”

## Harsh Vardhan

*Chairman, Starair; former Managing Director, Vayudoot; civil aviation industry watcher*

Internationally carbon emissions in the environment from aeroplanes, amount to 2%, which is all the more harmful at high altitudes. Biofuel will hopefully help eliminate this. However, there are still challenges. Internationally, the industry is working towards finding solutions. One of the problems with biofuel is this: the aircraft's engines have to provide inflow of fuel (fossil fuel), at a specific calorific value. To achieve that calorific value, aviation turbine fuel has a certain volume which converts into energy and provides thrust to the aircraft. Now, experiments are going on to ascertain if the same amount of biofuel can generate the same calorific value, or if a higher inflow of biofuel is needed. The long-term shelf value of biofuel is still not proven. Beyond a point it tends to disintegrate and then it becomes a kind of jelly. The cost of producing biofuel is higher than that of standard fuel. The experiments done so far have been to mix it in a limited way. So, sustainability and cost become major issues.

We need to solve the storage problem of the fuel, which is at the second stage of experimentation now. More than anything, it needs to be accepted globally, which may take another 15-20 years.

### **The India story...**

First, we have to scale up production, and then see how other modes of transportation respond to it; then we can use it for aircraft. The countries which are very aggressive in the use of biofuel — Australia and Canada — are both agriculture-based economies. Here's the picture in our country. India is deficient in the production of fossil fuel, and has an advantage with biofuel because of its huge agricultural base. However, we still need a commercial set-up for it. While the Government of India has a biofuel policy for the aviation sector, they haven't come out with a biofuel policy for the rest. Unless we start using biofuel in other modes of transportation, doing it just for the aviation sector will be difficult. That way, the scale of production will go up, you will gain experience, and you can see how it behaves.

## National policy on biofuels

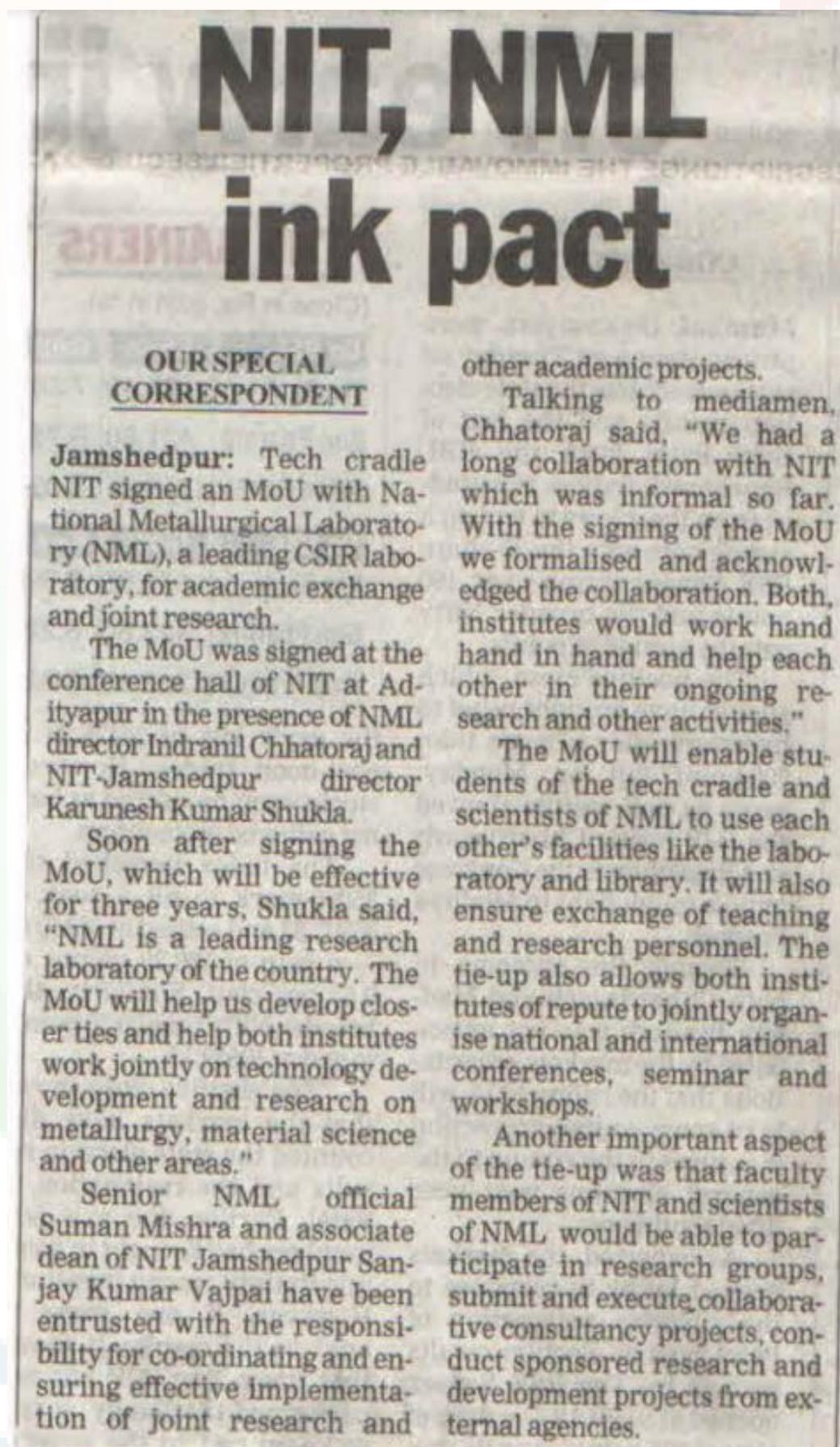
*This year, the Cabinet approved a national policy on biofuels, which was initially announced in 2009. The policy stressed on the development and utilisation of indigenous non-food feedstocks, research, processing and production of biofuels and a blending mandate of 20% ethanol and bio-diesel by 2017.*

**Published in:**

[The Hindu](#)

CSIR-NML

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The Telegraph

CSIR-NML

12<sup>th</sup> December, 2018

# शोध व प्रशिक्षण को प्रोत्साहित करने के लिए एनएमएल और एनआईटी में करार

तीन साल तक दोनों संस्थान एक-दूसरे की सुविधाओं का आदान-प्रदान करेंगे

सिटी रिपोर्टर | जमशेदपुर

शोध और प्रशिक्षण के आदान-प्रदान के लिए मंगलवार को एनआईटी (नेशनल इंस्टीट्यूट ऑफ टेक्नोलॉजी) जमशेदपुर और एनएमएल (नेशनल मेटलर्जिकल लेबोरेटरी) जमशेदपुर के बीच करार हुआ। एनआईटी जमशेदपुर के कॉन्फ्रेंस रूम में आयोजित समारोह में एनआईटी के निदेशक प्रो. करुणेश कुमार शुक्ला और एनएमएल के निदेशक डॉ. इन्द्रनील



समझौता के बाद एक-दूसरे को बधाई देते प्रो. शुक्ला व डॉ इन्द्रनील।

चट्टोपाध्याय ने एमओयू (मेमोरेंडम ऑफ अंडरस्टैंडिंग) पर हस्ताक्षर किए। तीन साल के इस करार के तहत दोनों संस्थान अपनी विशेषज्ञता और सुविधाओं का आदान-प्रदान करेंगे।

**Published in:**

Dainik Bhaskar

CSIR-IHBT

11<sup>th</sup> December, 2018

## Event on cultivation of apple variety

**Palampur:** A capacity-building programme on the cultivation of low-chilling varieties of apple and their post-harvest management, organised by the CSIR-Institute of Himalayan Bioresource Technology, Palampur, for Northeastern Region Community Resource Management Project (NERCORMP) Communities, concluded on Monday.

Twenty five young farmers and officials from NERCORMP attended the event. Participants were demonstrated cultivation practices of low-chilling apple, role of honeybees, post-harvest management, nutrient management, insect pests and disease management. Participants were given practical exposure to different field activities in Palampur and Kullu. According to Dr Shailendra Chaudhari, managing director, NERCORMP, the programme was organised to introduce low-chilling apple cultivation in the Northeastern states. [oc](http://oc)

**Published in:**

The Tribune

CSIR-IHBT

11<sup>th</sup> December, 2018

# अब मिजोरम-मणिपुर भी उगा सकते हैं सेब

अमर उजाला ब्यूरो

पालमपुर (कांगड़ा)। हिमाचल की तर्ज पर सेब अब उत्तर-पूर्वी राज्यों में उगाया जा सकेगा। आईएचबीटी-सीएसआईआर में उत्तर-पूर्वी क्षेत्र सामुदायिक संसाधन प्रबंधन परियोजना (एनईआरसीओआरएमपी) के समुदायों के लिए सेब की लोचिलिंग किस्मों की खेती पर छह

**आईएचबीटी ने उत्तर-पूर्वी क्षेत्र के लोगों को दिया प्रशिक्षण मणिपुर ऑफ सीजन में भी उगा सकता है सेब की फसल**

दिवसीय प्रशिक्षण दिया जा रहा है। इस प्रशिक्षण शिविर में 25 युवा बागवान और अधिकारी भगा ले रहे हैं। आईएचबीटी के निदेशक डॉ. संजय कुमार ने कहा कि कम ठंड वाले क्षेत्रों के लिए अनुकूल किस्मों को 300-500 घंटे चिलिंग आवर्स

की ही आवश्यकता होती है। ऐसा वातावरण मणिपुर राज्य के क्षेत्रों में भी उपलब्ध है। सेब की कम शीतलन किस्मों को लगाना राज्य के कृषकों के लिए उपयोगी होगा और इससे मणिपुर ऑफ सीजन सेब की फसल के एक नए सेब राज्य के

रूप में उभर सकता है। किसान सेब के साथ-साथ उच्च मूल्यवान औषधीय और सुगंधित पौधों और शहद उत्पादन के लिए मधुमक्खीपालन सहित अंतर फसल विधि (इंटरक्रॉपिंग) से आय बढ़ा सकते हैं। एनईआरसीओआरएमपी के प्रबंध निदेशक डॉ. शैलेंद्र चौधरी, अभिजीत सरकार, टिचिकस वासुम, विमा वासुम और सोमिपम लॉगलेंग आदि अधिकारी मौजूद रहे।

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## एनएमएल के शोध कार्य से जेएच तारापोर के विद्यार्थी अवगत हुए

जासं, जमशेदपुर : धतकीडीह स्थित जेएच तारापोर स्कूल के 35 बच्चों के दल ने सोमवार को राष्ट्रीय धातुकर्म प्रयोगशाला (एनएमएल) का भ्रमण किया। छात्राओं के दल ने वहां होनेवाले शोधकार्यों के बारे में जाना। जिज्ञासा- एनएमएल स्कूल इंटरैक्टिव प्रोग्राम के तहत आयोजित इस कार्यक्रम में वैज्ञानिकों व रिसर्च स्कॉलर्स ने तीन घंटे तक विद्यार्थियों को प्रयोगशालाओं की गतिविधियों के बारे में बताया। कार्यक्रम के समन्वयक प्रिंसिपल साइंटिस्ट डॉ.



एनएमएल में शोधों के बारे में जानकारी लेते जेएच तारापोर स्कूल के बच्चे।

पीएन मिश्रा ने संस्थान की प्रमुख उपलब्धियों पर प्रकाश डाला। साथ ही प्राकृतिक संसाधनों जैसे खनिज, ओर्स, चट्टान के बारे में जानकारी देते हुए बताया कि किस तरह एनएमएल ने शोध के जरिए इन्हें अधिक उपयोगी बनाया। इसके बाद दल ने विभिन्न शोध इकाइयों का भ्रमण किया। सीनियर टेक्निकल ऑफिसर एसएन हेंब्रम ने छात्राओं का सहयोग किया। एनलिटिकल केमिस्ट्री सेंटर में सोनी

झा, एनएमएल के उत्पाद विकास के बारे में डॉ. अशोक कुमार मोहंती, रिसाइक्लिंग पर डॉ. मनीष झा ने छात्रों को उपयोगी जानकारियां दीं। छात्राओं में कामिनी चौधरी, लिप्सा स्वाई, नेहा महतो, देवयानी ने इस भ्रमण कार्यक्रम को काफी उपयोगी बताते हुए कहा कि यह उनके लिए एक अलग अनुभव रहा। छात्राओं के दल का नेतृत्व शिक्षिकाओं निमिषा कौशिक व महुआ घोष ने किया।

## CSIR-NCL

### **Professor JW McBain memorial lecture at CSIR-NCL**

**PUNE:** Council of scientific and industrial research - national chemical laboratory (CSIR-NCL), Pune organised the fourteenth professor JW McBain memorial lecture on November 30, 2018. The lecture was given by AK Shukla, honorary professor, Indian Institute of Science, Bengaluru on the topic, 'Batteries for a sustainable world'. In his lecture Prof AK Shukla said that energy is enabling and pervasive. "The more you generate, the more it is in demand," he said. He reminded that The modern energy services are crucial to human well-being and to the countries for economic development but yet globally over 1.3 billion people are without access to electricity and 2.6 billion people are without clean cooking facilities. More than 95% of these people are from either Sub-Saharan Africa or in Asia and 84% of these are from the rural areas.

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