

# CSIR in Media



*75 Years of*

**CSIR Touching Lives**

**A Daily News Bulletin**

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CSIR-NPL

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भारतीय वैज्ञानिकों ने तकनीक विकसित की, 50 लीटर पानी से सौ वॉट बिजली का उत्पादन

## ‘वाटर सेल’ से सस्ती बिजली तैयार होगी

नई दिल्ली | मदन जैड़ा

सोलर सेल की तरह जल्द ही वाटर सेल से सस्ती बिजली तैयार होगी। पानी से चलने वाले हाइड्रोइलेक्ट्रिक सेल (वाटर सेल) से छह महीने में महज 50 लीटर पानी खर्च कर सौ वॉट बिजली पैदा की जा सकेगी।

वैज्ञानिक और औद्योगिक अनुसंधान परिषद (सीएसआईआर) की प्रयोगशाला नेशनल फिजिकल लेबोरेटरी (एनपीएल) ने इस तकनीक को विकसित किया है। सूत्रों के अनुसार इसे जल्द ही भारतीय बाजार में उतारा जाएगा। इस तकनीक

20 साल तक चलेगा सेल  
सोलर सेल से जहां 10 घंटे तक बिजली ली जा सकती है। वहीं, वाटर सेल से 24 घंटे तक बिजली तैयार की जा सकती है। यही नहीं वाटर सेल प्लेंट 20 साल तक चलती है। जबकि सोलर सेल की प्लेट कुछ साल में खराब हो जाती है। वाटर सेल पर्यावरण के अनुकूल भी है।

सोलर बनाम वाटर सेल  
● वाटर सेल में लगी मैग्नीशियम फेराइट प्लेट 0.9 वोल्ट बिजली पैदा करती है। इतनी क्षमता के सेल बनाने का खर्च 17 रुपये है  
● जबकि इतनी ही क्षमता और आकार का सोलर सेल भारत में बनाने पर 32 रुपये का खर्च आता है

इससे बड़े पैमाने पर ग्रिड के लिए भी बिजली पैदा की जा सकती है। यह तकनीक बेहद सरल है जो पानी से बिजली बनाती है। उससे क्या-क्या उत्पाद बन सकते हैं यह उद्योग जगत तय करेगा।  
—आरके कोटनाला, वैज्ञानिक

को एनपीएल के मुख्य वैज्ञानिक आरके कोटनाला एवं उनकी सहयोगी ज्योति शाह ने ईजाद किया है।  
अमेरिकी पेटेंट मिला : वैज्ञानिक आरके कोटनाला की टीम ने सोलर सेल पर शोध करते-करते हाइड्रोइलेक्ट्रिक सेल का निर्माण किया। पिछले साल उन्हें इसके लिए अमेरिकी पेटेंट भी मिल गया है। सूत्रों के अनुसार, इस तकनीक को बाजार में लाने के लिए कंपनी से बातचीत हो चुकी है। इसके बाजार में जल्द आने की संभावना है। हालांकि इसका दाम कितना होगा यह अभी तय नहीं हो सका है।

### Published in:

Hindustan, Page 1

Rashtriya Sahara, Page 1

## Krishishakti tractors commercially launched in West Bengal

CSIR-CMERI

28<sup>th</sup> April 2017

The CSIR - Central Mechanical Engineering Research Institute (CMERI), Durgapur, commercially launched 'Krishishakti', - the low cost tractor in West Bengal for the benefit of small farmers in the state. A batch of tractors will be sold to the farmers of North Bengal through the dealer.

For the sake of farmers with small land holdings, CSIR-CMERI had developed Krishishakti - a 12 hp tractor and the technology was officially launched in 2014 at New Delhi.

Since then, the technology has been transferred to a private company in Howrah for production and

commercialization in West Bengal. With continuous technical assistance of CSIR-CMERI, the licensee private firm established the assembly line for Krishishakti tractor at Howrah with an initial capacity of 100 tractors per year. This tractor is very much suitable for small sized land due to its size and lower turning radius.

Officials said that compared to other available large sized tractor, the operation and maintenance cost of 'Krishishakti' is much lower. Due to this, small farmers may be in a position to have the ownership of 'Krishishakti' tractors instead of cultivating with a walking tractor or a hired one.

**Published in:**

[TOI](#)

## Indian scientists find chalcone, a new anti-diabetic drug sourced from plants with faster response time

CSIR-CDRI

28<sup>th</sup> April 2017

Indian scientists have found that a plant-derived substance called chalcone can be used to make an effective anti-diabetic drug. Chalcone, which is ubiquitously found in many plants, improves insulin sensitivity and reduces blood glucose levels in the same way as commercially available anti-diabetic drugs.

Patients with type-2 diabetes are unable to utilise sugars properly. After a meal, their blood glucose levels remain elevated for prolonged periods of time. Gradually their muscles become insensitive to insulin, the hormone that converts unspent blood glucose into glycogen which is stored in the liver. Since the amount of glycogen also reduces with time, patients develop cholesterol disorders.

Scientists from the Central Drug Research Institute (CDRI), Lucknow, have reported that treating muscle cells with a particular type of chalcone can improve glucose uptake. This makes it particularly useful for diabetic patients. Since their muscles are insensitive to insulin resulting in poor glucose uptake, chalcone can help manage diabetes by improving glucose uptake. Of several chalcones tested, one — aryloxypropanolamine — had anti-diabetic properties.

The effects of chalcone on blood glucose have been studied in laboratory rats which were fed on both commercially available anti-diabetic drugs like metformin and pioglitazone, and chalcone. It was found that chalcone was as effective as other drugs in reducing blood glucose levels.

“Chalcone significantly inhibited the rise of blood glucose in animals and brought back the glucose levels to normal much earlier than commercial anti-diabetic drugs. Diabetic mice showed a decrease in total cholesterol, LDL-cholesterol levels, and increased serum HDL-cholesterol like those of commercial anti-diabetic drugs,” scientists have observed in their study published in journal Current Science. Chalcones continues to function in the body for almost a day.

In addition to its efficacy, animal studies confirmed that chalcone is non-toxic and safe. It is stable under human stomach-like conditions, invigorating its potential as a good drug.

“The chalcone compound offers a promising lead for development as a drug for the management of type-2 diabetes mellitus”, say scientists.

The research team included Poonam Shukla, Mavurapu Satyanarayana, Prem C Verma, Jaya Tiwari, Atma P Dwivedi, Rohit Srivastava, Neha Rehuja, Swayam P Srivastava, Sudeep Gautam, Akhilesh K Tamrakar, Anil K Dwivedi, Hari N Kushwaha, Nagsen Gautam, Shio K Singh, Mukesh Srivastava, Chandishwar Nath, Ram Raghbir, Arvind K Srivastava, and Ram Pratap.

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[First Post](#)

## IGIB uses novel drug discovery approach to identify drug targets in TB bacteria

CSIR-IGIB

28<sup>th</sup> April 2017

Work has already begun in finding out novel lead compounds for 15 drug targets

In a completely different approach to drug discovery, a team led by Dr. Samir K. Brahmachari, a J.C Bose National Fellow, at Delhi's CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) has used a combination of approaches to predict potential drug targets in *Mycobacterium tuberculosis*, the TB-causing bacteria. The novel method not only helps in speeding up drug discovery by finding potential, non-toxic drug targets but will also cost far less by reducing the chances of failure. The results were published in the journal *Scientific Reports*.

### Systems biology

“Conventionally, drug discovery was never looked at from a systems biology point of view. The approach we used was rather unconventional. We looked at finding targets first based on evolutionary conservation principle in an organism,” says Dr. Divneet Kaur from IGIB and the first author of the paper. Evolutionary conservation is based on the premise that genes that are very critical for the bacteria do not undergo any mutation.

Based on a previous study that used the Systems Biology Spindle Map (SBSM) approach, the team was able to identify 890 novel, non-toxic gene drug targets. Using computational approaches, the potential drug targets were reduced to 116 essential genes; these 116 genes are so vital that any inhibition would kill the bacteria.

In order to identify drug targets with the least likelihood of side effects, the 116 essential genes were compared with the human genome and human microbiome at the sequence level to identify genes that did not have any similarity (homology) with human genome sequences.

Of the 116 genes, 104 were found to have no similarity with the human genome sequences, meaning any drug developed targeting these 104 genes will only target the TB bacteria and not cause any harm to human cells.

The potential drug targets were further shortlisted to 33 genes. The 33 genes play an essential role in bacteria metabolism and have not undergone any mutation in any of the 1,623 TB strains, including the 1,084 multidrug-resistant TB strains isolated from people with TB. The presence or absence of mutations in any of the 33 genes was evaluated using the Genome-wide Mycobacterium tuberculosis Variation (GMTV) database. The genes which are essential for bacteria never undergo any mutations as that would be lethal for their survival.

The crystal structure, which is essential for carrying out drug discovery process, was available for 15 of the 33 targets. “For the 15 genes which have a crystal structure, work has already begun in finding out novel lead compounds for the targets,” says Dr. Mukta Sharma, who is presently involved in the study but is not an author of the paper.

“Once we have the targets and have structures of these targets then can tailor-make molecules to inhibit even MDR-TB and XDR-TB,” says Dr. Kaur. Dr. Debasis Dash from IGIB and one of the authors of the paper helped identify the amino acid changes and mapped them on to the proteins. Rintu Kutum from IGIB is the other author.

The team has already carried out druggability assessment (to find out if the targets have certain properties for a drug to bind to receptors) for all the 33 gene targets. “Most of the 33 genes were found to be highly druggable and none was found to be non-druggable,” says Dr. Sharma. “This validates the approach adopted by this study.”

“There is a need for drug discovery to move from Wright brothers’ era of trial and error method. The trial and error approach is slow and too expensive,” says Dr. Brahmachari. “Through computational approach we first make sure that the target is the Achilles’ heel of *M. tuberculosis* and is absent in human cells. Using our new approach, we can work on all organisms.”

According to Dr. Brahmachari, all the genes, targets and even ligands will be in open source so anyone can develop new drug molecules.

## Drug resistance

In order to understand the drug resistance seen in many TB drugs, the researchers evaluated the gene targets of known drugs — isoniazid, pyrazinamide, ethambutol for any mutations. “The current drug targets show a high degree of mutations,” says the paper. While isoniazid showed relatively lower variation compared with other drugs, the target of bedaquiline (for MDR-TB) drug showed no mutation. According to the paper, this “supports the hypothesis of the importance of completely invariant genes as potential targets for the successful development of novel antibiotics”.

Metformin, a drug used for diabetes care, was found to have minimum number of mutations, so can be repurposed as an adjunct therapy for MDR-TB.

**Published in:**  
[The Hindu](#)

## Clones to ensure revered Parijat tree lives forever

CSIR-NBRI

30<sup>th</sup> April 2017

Wishes have no end and a wish-granting tree should never die. More so if the tree is worshipped as a deity and believed to have roots in the Mahabharata.

It is for this reason that NBRI will clone Barabanki's revered Parijaat tree that has stood tall for thousands of years in Kintoor village. The three clone trees will come up on the same campus where devotees come to ask for fulfilment of their wishes from the 'kalpavriksha' (the wish-granting tree).

National Botanical Research Institute would work on cuttings and tissue culture for the project with an aim to keep the legacy of the tree alive after it is dead.

The institute would also conduct a molecular study to find the origin of

the tree. Parijaat (*Adansonia Digitata*) is an African specie with peculiar features.

It is a matter of study how it reached Barabanki.

The age of the tree has always intrigued scientists. "We will ask Birbal Sahni Institute of Paleosciences to study the age of the tree," said NBRI senior principal scientist SK Tiwari.

A team of NBRI scientists including director Prof SK Barik visited the site of the tree last week.

Though there is no written account of its history, it is believed that the tree has existed from the time of the Pandavas. It is said to have been born from the 'Samudra Manthan' (churning of ocean) and brought to the earth by Arjun from the garden of Indra for his mother Kunti.

According to legend, it was only after Kunti offered Parijaat's flowers to Lord Shiva that Pandavas won the battle of Mahabharat.

NBRI has been treating the tree since February 2016 after forest department sought help from the institute. Due to sugary offerings made by devotees to it, the tree was found infected with termites. It also had fungal and bacterial infections.

NBRI began a chemical treatment and recommended that a biopesticide be applied on the trunk and leaves of the tree.

"The base of the tree still seems affected and we have suggested ways to the forest department," said Tiwari.

The institute would also try to establish a link between this tree and other age-old Parijaat trees in the state. "We know of other old Parijaat trees in Basti and Sultanpur. Besides, there are trees on NBRI and zoo campuses too. We will study where these came from," said the scientist.

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[TOI](#)

## This Ethiopian crop could save Indian farmers

CSIR-CFTRI

29<sup>th</sup> April 2017

Teff is a tiny poppy seed sized grain that is a staple crop of Ethiopia. People in India and Karnataka would know of Ragi, a close cousin of Teff.

Teff as Superfood

The Central Food and Technological Research Institute(CFTRI)introduced Teff in India this year in an effort to promote it as a “superfood” as well as a means of easy source of earnings for farmers.

Seeds of 19 different varieties of Teff were brought to India from the US Agricultural Department. After four years of trial and field testing, only two types of seeds (white and brown) were found to be suitable to Indian conditions and yielded high produce.

These seeds were further tested and distributed to local farmers and the NGO, Art of living Foundation with the aim to help farmers earn profits from this in demanded International crop.

Professor Rajasekharan, Director of the CFTRI says that the import rates of Teff are very expensive for the average Indian market.

CFTRI is the first institute in India to introduce the crop with an aim to make it more accessible and less expensive to the citizens. It's extensive testing and trial began in 2013 after which the seeds were grounded into powder and sold to the farmers or seed providers who were interested in growing the crop.

“Since farmers and citizens are still not aware of Teff, the institute is focusing on increasing awareness of the seed in order to increase its demand on a national platform,” says Rajasekharan.

Teff can be substituted for rice or wheat and can be also made into idli or dosa. It can also serve as a replacement for yeast to make bread. Its nutritional value is very high with essential amino acids, albumin enriching protein and is rich in micro-nutrients such as Calcium, Iron, Vitamin C and others as well.

Dr Deepa Prakash, nutritionist points out that Teff helps control lifestyle diseases such as diabetes and obesity as it is gluten free and has high resistancy to starch content that helps the body retain its glucose content for a longer period. Merely 100 gms of Teff a day compensates for the lack of Iron in one’s diet. “Teff has a very subtle comforting nutty flavour and eben I use it every morning as porridge, it makes me feel very energetic throughout the day,” she says.

Teff can be grown in the Kharif (June- July) and the Rabi (October- November ) seasons and is most suitable for drier zones as it is a drought resistant crop that requires a minimum level of water to grow. It’s high nutritional value and high resistannce to diseases make it easier to grow than Ragi. “We plan to make Teff a crop that is in high demanded and sustainable for all households,” adds Rajasekharan.

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[New Indian Express](#)

## WBPCB-NEERI study to map pollution level of Kolkata-Howrah

CSIR-NEERI

28<sup>th</sup> April 2017

The West Bengal Pollution Control Board has initiated a joint study to map the pollution level of the twin cities of Kolkata and Howrah and chalk out an action plan. The study will be done in collaboration with the National Environmental Engineering Research Institute (NEERI).

"The study, which may take two years to complete, shall come up with a clear identification of pollution potential and help us to formulate an action plan to curb air pollution," a WBPCB official said.

NEERI Director Rakesh Kumar said, the source of pollutants in different areas will be evaluated in the study, which will take about two years time.

"The air quality of the area is

determined through monitoring network of 19 ambient air quality monitoring stations in Kolkata and six stations in Howrah. The report of these air quality monitoring stations, analysed over a period of four years, shows that both cities remain non-compliant with respect to extremely vulnerable air pollutants like PM-10 and PM-2.5 for more than five months in a year, especially during winter time," the WBPCB official said quoting a recent survey of the pollution watchdog.

The other parameters, in which the twin cities are also non-compliant, included nitrogen di-oxide (NO<sub>2</sub>), a significant air pollutant from automobile tail pipe emission and industrial high temperature, the official said quoting the survey.

The major sources of these pollutants are mainly automobile tail pipe emission, dust particles coming out of the construction sector, burning of fossil fuels, waste burning and re-suspension of particle matters, he said.

The deteriorating air quality has serious health effects leading to respiratory problem, asthma and many other serious ailments, he said.

About remedial measures, the official said, conversion of industrial fuel from coal to oil, phasing out of old commercial vehicles, introduction of BS standard for new vehicles, improvement of auto fuel quality, effective emission control system for large industries, banning open burning of dry leaves were the pre-requisites.

The WBPCB in its report, also called for a ban on burning of raw coal within three km radius of Victoria Memorial to protect the monument.

The WBPCB organised a workshop with all the stakeholders to formulate a methodology yesterday. PTI SUS MM

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**Published in:**

[India Today](#)

**Also Published in:**

[Millennium Post](#)

[DNA](#)

[TOI](#)

[NEERI](#)



CSIR-IMTECH

29<sup>th</sup> April 2017



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The Tribune  
The Times of India  
Dainik Bhaskar  
Hindustan Times

## CSIR-NAL holds Industry meet

CSIR-NAL

29<sup>th</sup> April 2017

**BENGALURU, DHNS:** National Aerospace Laboratories (NAL), the aerospace science and technology laboratory under the Council of Scientific and Industrial Research (CSIR), on Friday organised NALTech, an industry reach-out programme as part of the Make in India programme.

Inaugurating the event, NAL Director Jitendra J Jadhav said that industries can make use of technologies and engineering design capabilities to further enhance their product development capability.

“I would like to say that CSIR-NAL offers industries various business opportunities in partnership and collaborative mode, and also creating startups/incubators with industry partnerships,” said Jadhav.

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Deccan Herald

## Smarter firefighting system at Salar Jung soon

CSIR-CBRI

28<sup>th</sup> April 2017

Salar Jung Museum will soon get a revamped firefighting and safety system that will protect the iconic building and its priceless treasure troves from mishaps.

The museum authorities — under the guidance of Central Building Research Institute (CBRI), Roorkee, Uttarakhand — will install 300 fire alarms in addition to the existing 1,062 alarms present in various galleries of the museum.

The move to install more fire alarms comes after CBRI rolled a new building code, which specifies fire and life safety norms for high-rises. “The 300 new alarms will be installed in the service rooms, such as the power supply, AC and generator rooms.

The alarm system will help detect and warn the management through visual and audio appliances in case of smoke, fire, carbon monoxide leak or other emergencies,” said Ravi Kumar, Assistant Executive Engineer of the museum.

Currently, the museum has the latest fire-fighting system, comprising 400 extinguishers, a dedicated fire station and a water system to douse huge blazes.

Salar Jung Museum has 38 galleries spread on two floors and displays only a part of the original collection. Many artefacts that on display date back to the 4th century and are protected by a round-the-clock security system.

Founded in 1951, the museum is situated on the southern bank of the Musi River and is home to some of the rare sculptures, paintings, carvings, manuscripts, ceramics, textiles, carpets, clocks and furniture from all over the world.