



CSIR IN MEDIA

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CSIR-IICB

Obesity link to diabetes decoded

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New Delhi, Sept. 7: Scientists in Calcutta have deciphered a key mechanism to explain why obese people develop diabetes through a study that they say could also help drug-designers explore new anti-diabetic therapies.

The researchers at the Indian Institute of Chemical Biology, a laboratory under the Council of Scientific and Industrial Research, have shown that a protein secreted by fat cells activates the immune system to trigger inflammation and a poor response to insulin.

Doctors have known for decades that obesity is a risk factor for diabetes and that obesity is associated with a chronic, low-grade inflammation in fat tissues that alter the way the cells use up energy or respond to insulin. However, the molecular pathways to link this inflammation and insulin resistance—a precursor to diabetes—had remained unclear.



FAT PUZZLE

demonstrated that macrophages are an important source of inflammation in these tissues.

“Why do macrophages infiltrate obese fatty tissue has been a mystery,” said Dipayan Ganguly, a scientist at the IICB who led the new study. “Macrophages are usually activated by infections, their activation in the obese fatty tissue leading to chronic inflammation in the absence of any infection remain unexplained.”

To look for answers, Ganguly worked with research scholar Amrit Raj Ghosh and other colleagues at IICB and doctors at Calcutta’s Institute of Postgraduate Medical Education and Research and the ILS Hospitals. The team ran biochemical tests on 83 obese

vation of macrophages.

“This in turn leads to insulin-resistance,” said Satinath Mukhopadhyay, a collaborating endocrinologist at SSKM Hospital. “This is a condition where the body cannot use insulin efficiently and is a precursor for diabetes—people may be in an insulin-resistant state years before they develop diabetes,” he said.

The scientists have described their chemerin-triggered mechanism in the journal *Diabetes* and proposed that it may help in the identification of new molecular targets for drug design.

For example, pharmacological researchers could think about targeting either the chemerin protein or interfer-

— had remained unclear.

The study by the IICB scientists is a fresh advance towards unravelling these pathways. Pioneering research by two independent groups at Columbia University and the Novartis Institutes of Biomedical Research in the US had in December 2003 shown that obese fatty tissue is infiltrated by macrophages, a class of immune system cells.

The US groups had also

biochemical tests on 83 obese and 28 lean people who volunteered for the study.

They found that fat cells in the obese people produce unusually high levels of a protein called chemerin. They also found that chemerin draws a specific type of immune cells into fatty tissue, triggering a cascade of immunological events, leading to the production of a substance called interferon-alpha and the acti-

chemerin protein or interferon-alpha as a way to treat diabetes or prevent insulin-resistance.

The scientists say the unusually high levels of chemerin in obese people may also make it an early biomarker for insulin resistance.

“We think a blood test that looks for chemerin could help predict insulin resistance and diabetes years in advance,” Mukhopadhyay said.

Indian scientists create device to collect solar energy more efficiently

CSIR-CMERI



This new CSIR development may pose a solution to land restraints and solar energy production in India.

Scientists in India have designed a new “solar tree” that may help to address some of the challenges associated with the generation of solar energy. Developed by the Central Mechanical Engineering Research Institute, Durgapur – a laboratory of the Council for Scientific and Industrial Research – the functional clean-energy machine promises to utilise minimal land to harness maximum energy.

At a 2015 United Nations Conference on Climate Change in Paris, India pledged to slow the rate of its greenhouse gas emissions by a third by the year 2030. With an ambitious target of quadrupling its renewable power capacity to 175 gigawatts by 2022, the nation has been pushing for the type of progressive infrastructure not yet widely adopted even in the United States. While investment into the green energy sector has increased, the issue of land has always presented a barrier to its successful implementation.

The innovative, CSIR developed “solar tree” may provide some solutions. Taking up less than four metres of land, its size alone could dramatically reduce the amount of land traditionally needed for the generation of green energy – an enormous advantage in a country like India, where land is scarce and the acquisition of it remains a relatively sensitive issue.

“It takes about four square metres of space to produce energy which otherwise would have required 400 square metres of space,” Daljit Singh Bedi, CSIR New Delhi’s chief scientist confirmed to Voice of America. “So almost 100 times the space is saved, which as you know is very valuable.”

Comprising multiple photovoltaic panels held at different levels from branches made of steel, the ‘tree’ holds its conduction panels at a greater height comparative to the more conventional ground layout. This allows more sunshine exposure per hour in the day, generating more energy than standard solar power generating devices – 10-15 per cent more according to scientists. Its minimally invasive physical installation also contributes to keeping India’s land character in tact.

While a device of this nature may not seem particularly groundbreaking, for India – a nation where almost 250 million remain without access to electricity yet is the third largest emitter of greenhouse gases following China and the United States – it presents a radical solution to the disparity of access to electricity and the continuing problem of air pollution.

The plants size makes it ideal for installation in villages, rural farms and beside national highways. Already installed and functioning at the developer’s campus, CSIR’s Headquarters and at the residential campus of Minister of Science & Technology of India, researchers are also working on models with an aesthetic better suited to the needs of public parks and gardens.

LINDSAY SAMSON | September 8, 2016

Source: www.bizcommunity.com/Article/196/701/150497.html

Towards innovative biotech processes

CSIR-IICT



Dr Renu Swarup, Managing Director, Biotechnology Industry Research Assistance Council (BIRAC) inaugurated the 'Advanced Analytical and Characterisation Resource' (AACR) facility at the Biotechnology Incubation Centre (BTIC), Genome Valley in Shameerpet recently.

The AACR facility is established as a joint initiative of CSIR-Indian Institute of Chemical technology (CSIR-IICT), Society for Biotechnology Incubation Centre (SBTIC) and BIRAC. It is equipped with analytical instruments like FT-NMR (500MHz), UHP LC-Q-TOF/MS/MS, HPLC and Multimode (UV-Vis, Fluorescence, Luminescence) reader.

The facility aims to offer knowledge based analytical services in developing innovative biotech processes. In her inaugural address, Dr Swarup appreciated the value addition being created to the existing facilities in Genome Valley. She expressed the hope that the services offered by the new facility conform to regulations and standards, and would reach diverse users like industry, start-ups and university scholars.

Dr NV Satyanaraya, Secretary, SBTIC; Dr Krishna Yella, Bharat Biotech; Dr Yella Reddy, Sapala Organics Pvt Ltd; Dr Akshay Goel, Biological E Ltd and other industry representatives congratulated CSIR-IICT and SBTIC for establishing the facility.

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Source: www.thehansindia.com/posts/index/Hyderabad-Tab/2016-09-09/Towards-innovative-biotech-processes/252907