



CSIR News

NEWSLETTER OF THE COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

Volume 63 No. 17 & 18

website: <http://www.csir.res.in>

September 2013

In This Issue

193 In The News

- CSIR-IIIM, Srinagar Rededicated to the Nation
- CSIR-CDRI best CSIR Lab in Discovery Research in Therapeutics
- Get IST with a Click: Synchronize Time over Internet
- Teacher-CSIR-NML Interactive Programme (TECNIP) Launched

199 R&D Highlights

- Collaborative research at CSIR-CGCRI reveals giant spontaneous exchange bias in a nanocomposite of $\text{BiFeO}_3\text{-Bi}_2\text{Fe}_4\text{O}_9$
- Functional Relevance of Repetitive DNA – Journey from Junk to Jewel

202 R&D Facilities

203 Conferences

204 Symposia/Seminars

206 Visits

209 Foundation Day Celebrations

210 World Environment Day

211 Lectures

213 Honours and Awards

215 Obituary

216 Appointments

In The News

CSIR-IIIM, Srinagar Rededicated to the Nation



Chief Minister Mr. Omar Abdullah and Union Minister for Science & Technology and Earth Sciences Mr. S. Jaipal Reddy at the Rededication Function as Prof. Samir K. Brahmachari, DG-CSIR addresses the gathering

“I am glad that CSIR-IIIM, Srinagar has started breathing again,” said Mr. Omar Abdullah, Chief Minister of Jammu & Kashmir. He was speaking at a function organized to rededicate the Srinagar branch of CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu.

CSIR-IIIM, Srinagar was rededicated to the nation on 29 June 2013 jointly by Chief Minister Mr. Omar Abdullah and Union Minister for Science & Technology and Vice President CSIR, Mr. S. Jaipal Reddy, in the presence of DG-CSIR, Prof. Samir K. Brahmachari, State Minister for Science and Technology, Mr. Feroz Ahmed and Director, CSIR-IIIM, Dr. Ram Vishwakarma.

CSIR-IIIM was born when the Drug Research Laboratory, set up in 1942 under the J&K State Government, was taken over by CSIR in 1957 to establish an advanced research centre at Jammu. It was named as the Regional Research Laboratory (RRL), Jammu. Col. Sir Ram Nath Chopra, the father of Modern Pharmacology in India, was the founder Director of RRL.

The mandate of the institute in the earlier stages was essentially to exploit the natural resources of the region including medicinal and aromatic plants for novel molecules and screening these for biological activity. In 2005, it was renamed as the Indian Institute of Integrative Medicine (IIIM) with a view to explore natural products such as plants and



Chief Minister Mr. Omar Abdullah, Union Minister for Science & Technology and Earth Sciences, Mr. S. Jaipal Reddy and Prof. Samir K. Brahmachari, DG-CSIR during the rededication function of CSIR-IIIM, Srinagar

microbes to develop technologies, discover drugs and products of natural origin for the national and international market.

CSIR-IIIM has a branch laboratory at Srinagar and four field stations located in Jammu & Kashmir for preserving the germplasm of important medicinal and aromatic plants and for conducting large-scale cultivation trials to develop and standardize agro-technology and new varieties.

CSIR-IIIM, particularly its Srinagar Centre, has contributed immensely in the advancement of scientific knowledge, development and release of new varieties of medicinal and aromatic plants, maintenance of germplasm of significant medicinal and aromatic plants and initiation of a new aroma industry based on aromatic plants and their value-added products.

Due to disturbed conditions prevailing in Kashmir since 1989, almost all the scientific

and technical staff left. The staff strength in the branch laboratory at Srinagar was reduced to a single Scientist and a few technical staff, who took pains to protect and maintain the assets and valuable germplasm resource of the branch laboratory. The R&D work was reduced to a low profile for nearly 20 years. During disturbed times, the campus, which is located in the heart of the Srinagar city, was taken over by CRPF and ITBP to establish their base.

However, once normalcy returned to the state, it was decided to refurbish the Srinagar center to create state-of-the-art biology and chemistry laboratories. Since 2009, the entire lab infrastructure was created and high end analytical infrastructure such as 400 Mega Hz NMR, LC-MS-MS and other analytical tools were installed to initiate R&D work in biological as well as chemical sciences. The centre was finally rededicated on 29th of June

2013 by laying of the rededication stone.

Chief Minister Mr. Omar Abdullah and Union Minister for Science & Technology and Vice President CSIR, Mr. S. Jaipal Reddy inaugurated the modern Chemistry laboratory and laid the foundation stone of the new students hostel in the campus. On this occasion, two key laboratory buildings were named after Sir Col R. N. Chopra and Dr. Akhtar Hussain. All the dignitaries had a round of the laboratory to see the new facilities created in the institute for advanced research in chemical and biological sciences.

Speaking on the occasion Chief Minister Mr. Omar Abdullah appreciated CSIR for taking special interest in redeveloping the center with latest scientific infrastructure for the advancement of science and also developing and transferring technologies to the field to generate employment and income. He said there was also a dire need to develop adequate scientific infrastructure in colleges and schools to produce talented children with competitive knowledge.

Speaking at the function, Vice President CSIR, Mr. Jaipal Reddy expressed great pleasure at the world class biological and chemical laboratories in Srinagar which would go a long way in the economic development of the State. As the Union Minister for Science & Technology, he also announced several projects related to the J&K State:

1. Establishment of the Industrial Biotech Parks in Jammu and Srinagar with the participation and support of Department of Biotechnology (DBT) and CSIR.

2. Technical and strategic support for realizing the full potential of the growth of the unique Aroma Industry in the J&K State.

3. Establishment of a *CSIR Science Centre* at IIIM, Srinagar including a value-addition centre for the aroma industry, a state-of-the-art leather-design center, marketing-networking facilities and a Science Museum for children of the Kashmir valley.

4. Creation of a New Research Centre of CSIR-IIIM in the Ladakh region of J&K with the support of CSIR-IIIM to tap the talent and potential of young ones from the Leh and Kargil districts of the region.

5. Initiation of major human resource development programmes for the youth of Jammu & Kashmir State, under the umbrella of the newly created Academy of Scientific and Innovative Research (AcSIR).

During the welcome address, Dr. Ram Vishwakarma, Director, CSIR-IIIM made an elaborate presentation on the scientific achievements made by the CSIR-IIIM in the region, and the role of the institute in employment and income generation. He also referred to the future plans of the institute for the socio-economic development of the state. The presentation made by the Director was highly appreciated by the Chief Minister, Union Minister and DG-CSIR.



Chief Minister Mr. Omar Abdullah appreciated CSIR for taking special interest in redeveloping the center with latest scientific infrastructure for the advancement of science and also developing and transferring technologies to the field to generate employment and income.

CSIR-CDRI best CSIR Lab in Discovery Research in Therapeutics

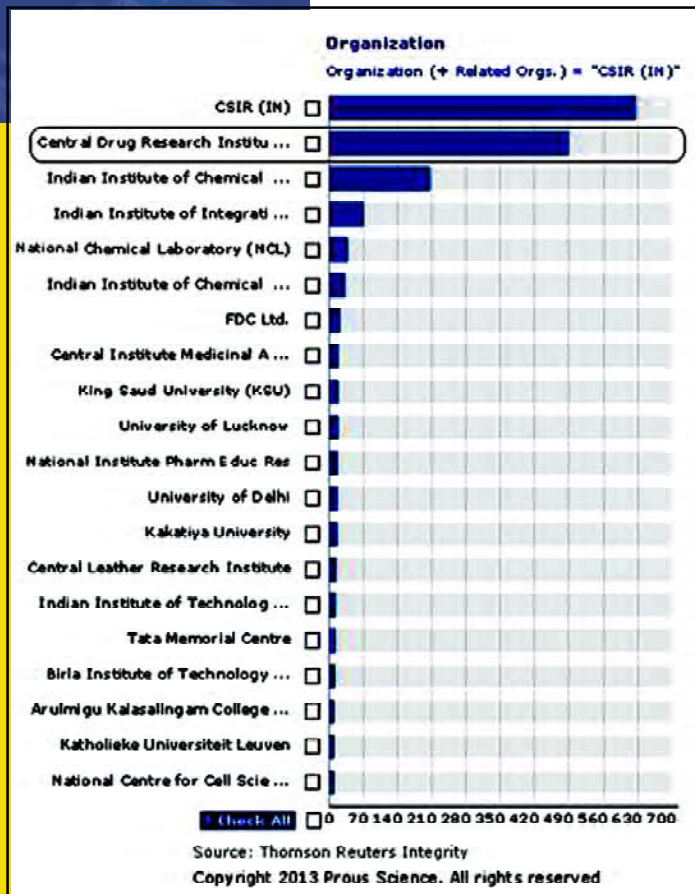
According to a recent report by *Thomson Reuters IntegritySM*, CSIR-Central Drug Research Institute (CDRI), Lucknow stands at number one position among the CSIR labs in discovery research in various therapeutic areas and contribution of related organizations under CSIR (including some Universities and other Institutes). *Thomson*

Reuters IntegritySM provides reliable, detailed information, from the perspective of a scientist, across multiple disciplines to support successful drug research and development.

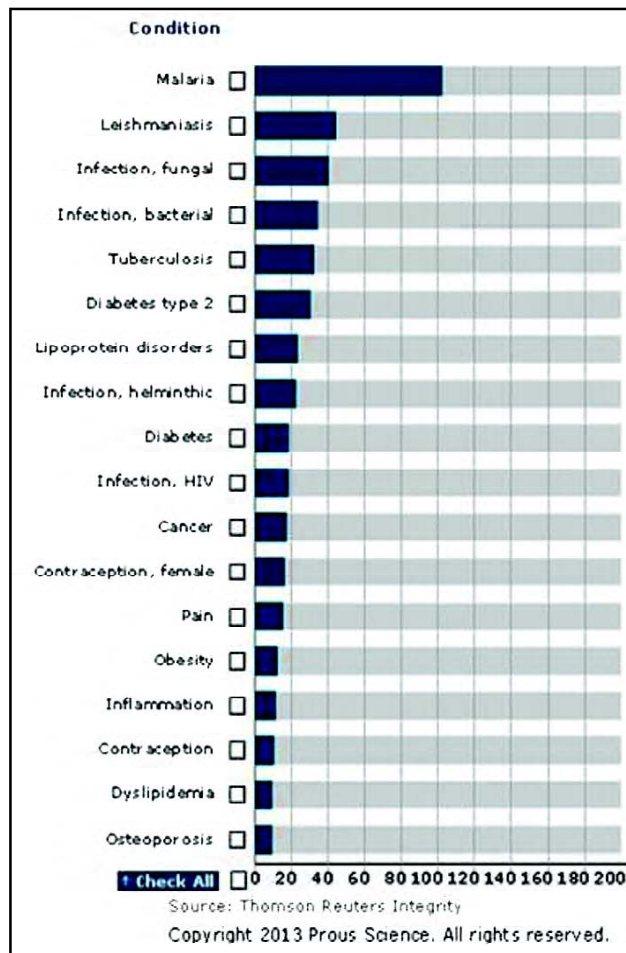
Thomson Reuters IntegritySM reports that CSIR-CDRI made significant contributions in 18 therapeutic areas, among them major contributions in the area of Malaria, followed

by Leishmaniasis, other infectious diseases (Fungal and Bacterial), Tuberculosis and Type 2 Diabetes.

The subsequent ranks in therapeutic discoveries have been bagged by CSIR-IICT, Hyderabad and CSIR-IIIM, Jammu.



Drug R&D contribution by each organization under CSIR



Drug R&D activity by CDRI in various therapeutic areas

Get IST with a Click: Synchronize Time over Internet



The CSIR-National Physical Laboratory (NPL), New Delhi is the custodian of the Indian Standard Time (IST). The time scale of CSIR-NPL, known as UTC (NPLI), is being maintained with the help of a cesium clock. Judicious frequency offset is introduced time to time. During the last one year, the time scale of CSIR-NPL has been

NTP server installed in the T&F Division, NPL, India

comparable with other leading timing laboratories of the world. The uncertainty of time scale is maintained at 7.6 nanoseconds.

Recently, a time service via Internet has been started by the T&F Division of NPLI. This time dissemination via Internet is called Network Time Protocol (NTP) Service. The server is capable of handling 7000 requests per minute.

But looking at the future prospects of this service, as the number of users increases adding redundancy becomes a must. Another NTP server with the same compatibility is being kept at the Central Computing facility to provide technical and physical redundancy.

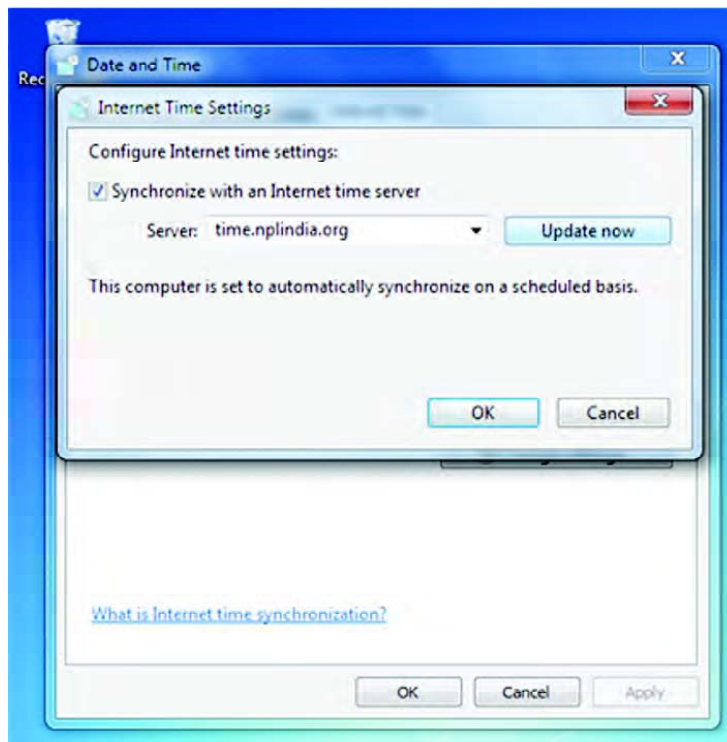
Using the service is very easy. Users just need to send a query at NPL's domain from their PC at the address: time.nplindia.org and within a few seconds, the PC will be synchronized to the IST. The synchronization accuracy is a few milliseconds over a wide area.

The team handling the service comprises Mrs. Pranalee P. Thorat, Shri Anil Kumar

For synchronizing PC time at time.nplindia.org: Go to Change Date & Time menu-Internet Time Settings Menu-Type NPLI NTP server address- Click Update Now-Ok.

Suri, Mrs. A. Chatterjee and Dr. A. Sen Gupta.

(For detailed information contact:
Head, T&F Division, NPL-CSIR,
Dr. K.S. Krishnan Marg, New Delhi-12,
Ph: 011 4560 8343, Fax: 011 4560 9240,
Email: sengupta@nplindia.org, or
thoratpp@nplindia.org)



Teacher-CSIR-NML Interactive Programme (TECNIP) Launched

Launched in June 2011 by the CSIR-National Metallurgical Laboratory (NML), Jamshedpur the School-NML Interactive Programme (SNIP) has captured the imagination, of the students and teachers in this region. SNIP has received appreciation from a cross section of society, including schools, press/media, District Education Department, NGOs and the public at large.

During the last two years, more than 7500 students and 214 teachers from 87 schools, belonging to both government and private sectors, participated in the programme and derived benefits. The programme has been designed to give students an exposure to modern laboratory working conditions and



A teacher training programme in session

motivate them to apply the various facets of science in day-to-day activities.

Under the programme, CSIR-NML has helped 21 schools to set up Science Clubs in their campus, to ensure that budding young minds who have earlier visited the laboratory maintain their focus and develop a passion towards science. As part of the initiative, the Laboratory also shared science literature and expert advice in establishing the Science Club. The school faculty were given counseling for maintenance of the clubs.

Impressed by the success and popularity of the SNIP, the Education Department of the East Singhbhum district, Jharkhand proposed a project on the *Organization of Workshop for Science Teachers of Govt. Schools of the District* at CSIR-NML.

The proposal envisaged a capacity building exercise for about 200 science teachers across the district to be conducted in two phases. The first phase would comprise a day-long orientation session (two batches in a month), which includes motivational orientation towards fundamental science, information on ways to upgrade school infrastructure and insights into recent

scientific developments. The second phase is planned as a two- to three-day subject-oriented residential training programme at the laboratory.

The first phase of the training programme, called the Teacher CSIR-NML Interactive Programme (TECNIP), commenced on 11 July 2013 at CSIR-NML with the participation of 33 science teachers of government schools across the district. The teachers were deputed by the District Education Officer (DEO), East Singhbhum Mr. Ashok Kumar Sharma.

The participants were treated to informative and motivational sessions comprising presentations, lively discussions, short video clippings, practical demonstrations, visits around the laboratories and large testing plants, display of mineral samples and valuable products.

The primary focus of the Workshop was to provide motivational training towards fundamentals of science, information on ways to upgrade the school infrastructure and insights into recent scientific developments.

“The workshop was so interesting and motivating that I want my school students to be a part of it,” said, Smt. Archana Patra, Asst. Teacher, LBS High School, Jaypura. Another teacher from the Jamshedpur High School, Smt. Seema Kumari said, “The programme organised at CSIR-NML is an excellent aid for teaching science to school students through theory and practical demonstrations. I wish I could continue for some more time.”

“I could clarify my doubts regarding scientific concepts through the training,”



Glimpses of the CSIR-NML Interactive Programme

felt Shri Subrata Kumar Ghosh, Asst. Teacher, Hindi High School, Kaimi, Baharagora. While Shri Nagendra Kumar Pandey, teacher from +2 High School, Baharagora said, “The best thing I earned from my visit to CSIR-NML is motivation. I never felt the same before. I can impart new knowledge to my students now.” Smt. Bandana Kumari, teacher from Golmuri High School was thrilled to see the recycling of electronic waste. She said, “It will help me

in motivating my students and sharing information on making wealth from wastes.”

Shri Prabir Kumbhakar, teacher from Tata Workers Union High School, Sidhgora said, “It is an innovative beginning and will go a long way in the development of scientific temperament among our students. I whole heartedly express my thankfulness to our DEO and Dr S. Srikanth, Director, CSIR-NML.”



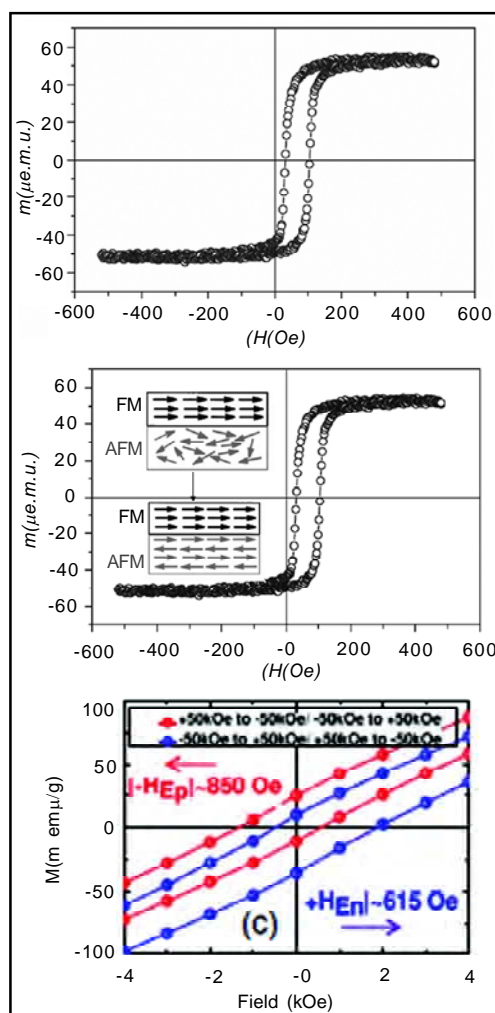
R&D Highlights

Collaborative research at CSIR-CGCRI reveals giant spontaneous exchange bias in a nanocomposite of $\text{BiFeO}_3\text{-Bi}_2\text{Fe}_4\text{O}_9$

A ferromagnet exhibits a symmetric magnetic hysteresis loop as the applied magnetic field is swept through a whole cycle. The situation changes completely when a ferromagnet comes into contact with either an anti-ferromagnet or a spin glass system. For such a composite system, the magnetic hysteresis loop shifts asymmetrically along the field axis and gives rise to different coercive fields.

It has been known since long that unidirectional anisotropy of the interface moment and consequent exchange bias field requires field cooling from above the ferromagnetic Curie point (at greater than anti-ferromagnetic Neel point). Spontaneous Exchange Bias (SEB), on the other hand, is observed even when such a composite is cooled down under zero field and the measurement is done from an unmagnetized state.

Under an Indo-Ireland collaborative programme sponsored by the Department of Science & Technology (DST), Govt. of India and Science Foundation of Ireland, Govt. of Ireland, Dr. Dipten Bhattacharya, Principal Scientist, Nanostructured Materials Division, CSIR-Central Glass & Ceramic Research Institute (CGCRI), Kolkata and his student



The magnetic hysteresis loops (a) symmetric for a ferromagnet, (b) asymmetrically shifted for a ferromagnet-antiferromagnet composite, and (c) exhibiting path-dependent shift for a nanocomposite of $\text{BiFeO}_3\text{-Bi}_2\text{Fe}_4\text{O}_9$; inset of (b) shows unidirectional anisotropy of interface moment under field cooling across the ferromagnetic-antiferromagnetic interface

Ms. Sudipta Goswami, along with Mr. Tuhin Maity and his mentor Prof. S. Roy, Tyndall National Institute, Cork, Ireland, have recently reported a novel finding in the *Phys. Rev. Lett.* [**110**, 107201 (2013)]. This team has shown that a nanocomposite of coarser BiFeO₃ (~120 nm) and finer Bi₂Fe₄O₉ (~20 nm) could exhibit giant SEB (300-600 Oe) across a temperature range 5-300 K.

Even more interesting is the discovery that the extent of SEB could be changed by following different protocols of tracing the hysteresis loop – from positive to negative maximum or opposite. This observation opens the scope of tuning the exchange bias just by adopting different measurement protocols.

Why is the SEB path dependent for this nanocomposite? The scientists argue that at

the interface of the ferromagnetic core of Bi₂Fe₄O₉ and anti-ferromagnetic BiFeO₃, superspin glass moments of the shell of Bi₂Fe₄O₉ induces a large variation in the exchange coupling energy landscape which pre-biases the interface moments along the negative direction of the applied field, preferentially, via a spontaneous symmetry breaking of the interface moments. Since BiFeO₃ is a room temperature multiferroic, this discovery is all the more important as with a multiferroic, one can tune the switching of the magnetic anisotropy of a ferromagnetic in a BiFeO₃-ferromagnetic composite even by applying an electric field.

This protocol-dependent spontaneous exchange bias offers additional tool for tuning the switching or sensing effect in nano-magnetoelectric systems.

Functional Relevance of Repetitive DNA – Journey from Junk to Jewel

A genome is the entirety of genetic information of an organism encoded by DNA sequence that serves as a vehicle to transmit hereditary information from generation to generation. Genome consists of genes encoding proteins (coding DNA), the workhorses of living systems, and the remaining non-coding part – DNA.

The size of the genome is found to increase, as expected, from simple to complex organisms. Surprisingly though, comparison of sequences of variety of genomes has revealed that the number of protein coding genes does not increase appreciably with increase in the complexity of organisms. The accumulation of non-coding part of the genome, whose function remains largely to be established, appears to be the driving force behind the evolution of complexity in living systems. This indicates that biological complexity has evolved not by addition of more genes to the genome, but by more sophisticated regulation of pre-existing genes. So much so that of the

3.3 billion nucleotides of the human genome, less than 2% code for protein and the remaining, more than 98% of it, is non-coding. It is now generally accepted that the selective advantage conferred by the accumulation of non-coding DNA is an important factor in the increase in genome size in complex organisms.

Humans have more than 200 cell types emerging during development from the identical genome in each cell. What creates these different cell types? While each cell of an organism contains the identical genome and, therefore, a complete set of all genes, only a subset of these genes is utilized by a particular cell type. This is an immensely complex regulatory process and at least some of the non-coding part of the genome is thought to contain the regulatory information responsible for deciding whether or not to express a gene in a specific cell type. The remaining genes are kept silent in a cell type specific manner. This selective expression of genes, set early during embryonic

Humans have more than 200 cell types emerging during development from the identical genome in each cell. What creates these different cell types? While each cell of an organism contains the identical genome and, therefore, a complete set of all genes, only a subset of these genes is utilized by a particular cell type.

development, determines the formation of different cell types, tissues and, eventually, the complete organism.

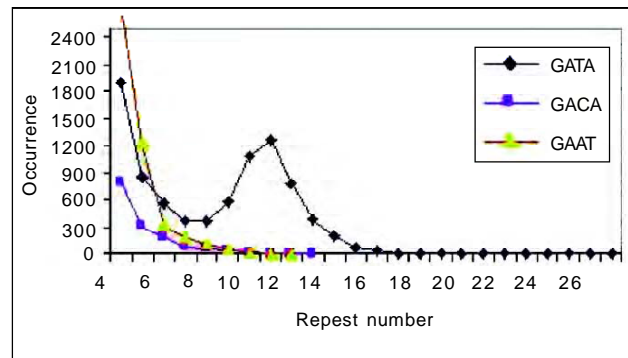
What is the nature of non-coding DNA? Much of this part of the genome (more than 50%) is repetitive in nature. Simple sequence repeats (SSRs), a.k.a. microsatellites, account for about 3% of the human genome, almost twice the size of the entire protein coding part. SSRs, very common in the complex genomes, are short sequences of nucleotides (1–6 bp in length) that are repeated in tandem.

Scientists from the CSIR-Centre for Cellular & Molecular Biology (CCMB), Hyderabad have investigated functions of this part of the genome. Several observations suggested strongly the functional relevance of these elements. These repeats, accumulated in the genome in parallel with the evolution of complexity in plants and animals, are found at hundreds of thousands of sites in the genome, whereas in prokaryotes, like bacteria, their abundance is extremely low. This study also revealed that only some of the SSRs are favored in most organisms and that there is always a most favored size range for these selected repeats. One of them being the GATA repeats. These observations are strong indicators of the idea that such SSRs are being positively selected during evolution. However, the function of such repeat sequences, the exact nature of the ‘positive selection’, has been a matter of much speculation for decades.

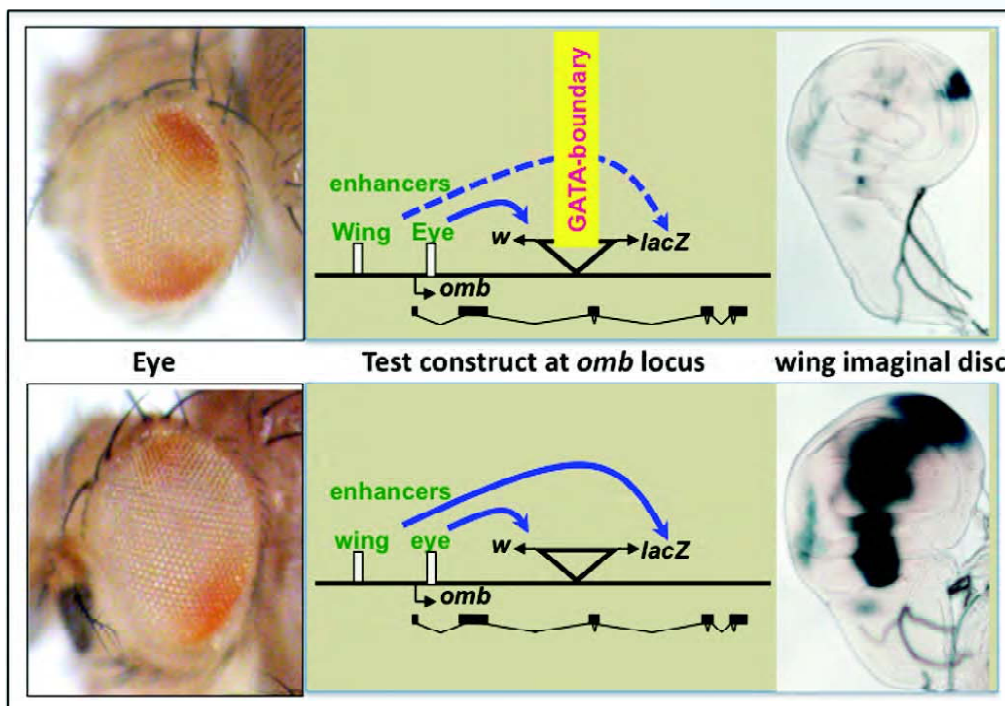
In the study that appeared in the 14th May issue of the journal *Nature Communications*, CSIR-CCMB scientists provide definite evidence for the functional significance of the GATA repeat. Taking initial clue from the genomic context of

these repeats and experiments in transgenic *Drosophila* and human cell culture, they show that this repeat DNA functions as boundary elements that separate functional domains of genome.

Boundary elements are key regulatory components that help in packaging of the genome in the small nuclear space and define regions of gene activity so that regulatory environment of even closely placed genes remain independent and do not interfere with the neighbours. There are often instances where one gene expresses in one particular tissue, while the adjacent gene expresses in



Frequency of GATA-SSR occurrence in human genome. While higher repeat numbers of other SSRs are in low abundance, GATA-SSRs are enriched for higher repeat numbers of 10-12. This strongly indicates a positive selection pressure operating to lead to accumulation of longer GATA repeats.



Drosophila eye with a bipolar pigmentation (left) indicates the *omb* locus as the genomic site of insertion of the transgenic construct carrying human GATA boundary test element. While access of wing enhancer to the target *lacZ* reporter gene is limited (upper panel), this access is unhindered when the GATA boundary has been flipped out (lower panel), seen as more prominent blue staining of the larval wing imago disc (right).

another one. In such situations, boundary element is predicted to be present between the two genes to maintain this tissue-specific expression, the absence of which can be disastrous for the cell.

This study, where GATA repeat elements isolated from human genome are found to be functional in fruit fly, *Drosophila melanogaster*, also reveals the evolutionarily conserved nature of these elements for about a billion years. This finding also opens up the functional investigation of other SSRs. It is important to recall that SSRs, including GATA repeats, are known to show polymorphisms, which are small variations in size of the repeat at different loci in the genome within a population. Such variations are the basis of DNA fingerprinting, a technique used to establish the genetic identity of a person. Considering that a favored size of GATA repeat is selected for its function, polymorphism may have subtle variations in function or strength of the boundaries that can have

regulatory consequences on the associated genes.

Such variations may also have important implications in susceptibility, disease conditions and, therefore, may contribute to the development of personalized medicine. Boundary elements may also be helpful in designing efficient gene therapy applications to prevent undesired effects of genomic elements present at the site of insertion of the gene therapy constructs when administered to the patients. Future studies along these lines hold promise.

Reference:

GATA Simple Sequence Repeats Function as Enhancer Blocker Boundaries, Ram P Kumar, Jaya Krishnan, Narendra Pratap Singh, Lalji Singh and Rakesh K Mishra, *Nature Communications*, 4, 1844 (doi:10.1038/ncomms2872). Published 14 May 2013.

*Rakesh K Mishra & Collaborators
at CSIR-CCMB*

R&D Facilities

Integrated Impact and Crashworthiness Research Facility at CSIR-NAL

CSIR-National Aerospace Laboratories (NAL), Bangalore has commissioned a crash sled that will have capability to cater to aerospace and automotive product development. This unique facility is part of an Integrated Impact and Crashworthiness Research Facility (ICRF), conceptualised and developed at the Structural Technologies Division, CSIR-NAL. ICRF has been developed as a high technology facility that will carry out research in this vital area of flight safety and occupant safety, applicable to both aerospace and automotive customers.

The facility has capability for bird strike testing using one of the largest bird strike airguns in the world, testing for runway debris, hail stones and other Foreign Object Damage (FOD). Drop towers have been

developed and can be used to test for aircraft crashworthiness. Occupant safety studies can be carried out using crash dummies to understand injuries to humans.

The facility is equipped with high speed imaging, crash recorders and material testing infrastructure. The use of simple airbags and other low cost safety solutions are being studied at the facility. Capability to carry out simulations has also been built up by engineers at the facility.

Conceptualised and built using frugal engineering concepts and partnership with SMEs, this facility is now available to both aerospace and automotive organisations with opportunities to carry out tests and show compliance with regulations required for aerospace and automotive vehicles.

The facility is equipped with high speed imaging, crash recorders and material testing infrastructure. The use of simple airbags and other low cost safety solutions are being studied at the facility. Capability to carry out simulations has also been built up by engineers at the facility.

Conferences

CSIR Pavillion at Global R&D Summit 2013



Global R&D Summit 2013, a two-day integrated conference and exhibition, was held from 25-26 July 2013 at The Ashok, New Delhi. The event was a milieu of local and global institutions, academia and industry that constitutes the R&D ecosystem.

Accomplished individuals from India and across the globe, comprising, senior R&D experts, policymakers, business leaders, innovators, investors and entrepreneurs from various sectors and areas of specialization were brought together to exchange ideas, experiences and best practices in R&D management and strategy, delivered through a mix of plenary addresses, panel discussions, presentations and workshops.

The conference had Ms Naina Lal Kidwai, President, FICCI and Country Head, HSBC India welcoming the gathering. The Keynote Address was delivered by

Dr. R. Chidambaram, Principal Scientific Adviser to the Govt. of India. The Theme Address was delivered by Dr. T. Ramasami, Secretary, Department of Science & Technology, Government of India. Dr. Shashi Tharoor, Minister of State for Human Resource Development, Government of India delivered a Special Address.

The exhibition at the Global R&D Summit 2013 showcased cutting-edge R&D. The exhibition provided a vibrant platform for corporate R&D centers, public labs, scientific and technological institutions, government departments, international trade and development agencies, scientific instrument and machine manufacturers, infrastructure developers and academic institutions.

CSIR put up an impressive and informative pavilion in the exhibition.



Vignettes of the CSIR Pavillion at the Global R&D Summit 2013

CSIR-NAL, Bangalore displayed Carbon fibres and two models of CNM5 at the exhibition.

Dr. Shashi Tharoor, Minister of State for Human Resource Development inaugurated the Global R&D Summit 2013 exhibition. The Minister then walked straight into the CSIR pavilion where the CNM5

models were displayed. Dr. Tharoor was briefed about CNM5 by Mr Bipul Sarkar, Senior Principal Scientist, C-CADD. Dr. Shashi Tharoor was very appreciative of CSIR's contribution to the society.

CSIR-NAL received some serious enquiries for both CNM5 and carbon fibre.

Symposia/Seminars

National Symposium on *Emerging Issues in Chitin and Chitosan Research* held at CSIR-IHBT



A session in progress

CSIR-Institute of Himalayan Bioresource Technology (IHBT), Palampur organized the Third National Symposium on Chitin and Chitosan. The symposium was organised in association with the Indian Chitin and Chitosan Society (ICCS) to enable entrepreneurs, industrialists, academicians, environmentalists and scientists to actively interact and discuss the advances,



Dr. P.S. Ahuja, Director, CSIR-IHBT addresses the gathering

opportunities, challenges, barriers and possible options. About fifty delegates from all over the country participated in the two-day symposium.

The inaugural session was presided over by Mr. Vikram Sudhakar, President of the Indian Chitin and Chitosan Society. Dr. P.S. Ahuja delivered the inaugural address and Dr. V. Shanmugam talked about the theme of the symposium.

A Plenary Lecture on the usage of bacterial chitinases as tools for crop protection was delivered by Prof. Appa Rao Podile of the University of Hyderabad. The scientific programme also included invited and oral presentations on eight themes. Scientists from CSIR-IMT, CSIR-NPL, CSIR-CFTRI, Delhi University, Pune University, The Gandigram Rural Institute, and Amrita Institute of Medical Sciences & Research Centre delivered keynote lectures.

The concluding session was chaired by Prof. Anupam Varma of the Advanced Centre for Plant Virology, Indian Agricultural Research Institute, New Delhi. Three best papers adjudged by a panel of judges were also awarded with the certificate of proficiency and emoluments.

It is anticipated that the direct exchanges of information in the two-day symposium would influence basic and applied research in chitin and chitosan science and business endeavours on a national scale. The *Journal of Chitin and Chitosan Science* will publish a special issue based on papers presented in the National Symposium.

CSIR-IICB Students Organize FICBNT-2013



The present and past students of CSIR-Indian Institute of Chemical Biology (IICB), Kolkata organized a one-day seminar on *Facets of in silico Chemical Biology for Novel Therapeutics* on 18 June 2013. The main objective of the seminar was to highlight various aspects of in silico Chemical Biology. The seminar was designed with three scientific sessions with lectures covering the spectrum from cheminformatics to structural biology. The spectrum contained a package of eight lectures encompassing various facets of in silico Chemical Biology.

The programme started with a welcome address by Dr. Chitra Dutta, Chief Scientist, CSIR-IICB. Dr. G.N. Sastry, Sr. Principal Scientist, CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad, delivered the Keynote

Address titled *Specificity in Drug-Receptor Interactions*. The first session started with the talk of Dr. C.N. Mandal, former Scientist, CSIR-IICB and a course coordinator of NIPER-Kolkata, on *A Journey through the in-house Development of Software*. The second talk was by Dr. B. Gopalakrishnan, Scientist, TCS, Hyderabad on *Structural Dynamics of E. coli Porphobilinogen Deaminase*.

The seminar was organised by the students for the students without any registration fee. Students from various institutes like NIPER-Kolkata, Jadavpur University, Calcutta University, West Bengal University of Technology, Bose Institute, Saha Institute of Nuclear Physics, NICED, N.S.H.M and Heritage Institute participated in the seminar.



Vignettes from FICBNT-2013

Visits

Union Finance Minister Visits CSIR-CECRI

Mr. P. Chidambaram, Finance Minister, Government of India visited CSIR-Central Electrochemical Research Institute (CECRI), Karaikudi on 27 July 2013.

Prof. Samir K. Brahmachari, DG-CSIR and Dr. Vijayamohan K. Pillai, Director, CSIR-CECRI welcomed him and briefed him about the on-going R&D activities.

Subsequently, the Minister had an inspiring discussion with young scientists of CSIR-CECRI. He then unveiled a bust of Padma Bhushan Dr. RM. Alagappa Chettiar at the entrance of the CSIR-CECRI premises. Shrimathi Umayal Ramanathan (daughter of Dr. Alagappa Chettiar), staff members and students of CSIR-CECRI witnessed the event.

Mr. Chidambaram also inaugurated the Ramanujan Block at Kendriya Vidyalaya in the campus. Prof. Brahmachari and Dr. Vijayamohan Pillai thanked the Minister for his painstaking efforts in getting the new block for Kendriya Vidyalaya and for his continued support.

The Minister, in his Inaugural Address, remembered the contributions of Dr. R.M. Alagappa Chettiar and other philanthropists and industrialists to the society, especially towards the cause of education. He explained the genesis and vision of Kendriya Vidyalayas and requested the teachers to continue their invaluable service with dedication and passion. He said that it was befitting to name the block, with smart classrooms, after Ramanujan, arguably the greatest mathematician ever born.

Mr. Chidambaram recalled the struggled-filled life of Ramanujan and his rise to glory. He wished that many more Ramanujans, C.V. Ramans and Sarvepalli Radhakrishnans emerge among the students present. He urged them to pursue their career in pursuit of pristine knowledge, as knowledge alone is immeasurable wealth.

Earlier in the day, Prof. Samir Brahmachari, Director General, CSIR met the young scientists of CSIR-CECRI and called upon them to focus on theme-based research work, creation of knowledge-based wealth and technologically sound and competitive products for the market. He also highlighted the need for a roadmap for the Institute and discussions among scientific minds in order to nurture new ideas. Saying that “even excellence needs slight pressure”, DG-CSIR requested them to pursue dreams



Glimpses of the visit of Union Finance Minister

to do good science, no matter whatever hardships they face.

Prof. Brahmachari then met the Director and Chief Scientists to take an account of the ongoing R&D activities. He was elated about the performance of the Institute, especially due to the collective leadership and the whole-hearted cooperation of all CSIR-CECRI staff.

He also inaugurated the ERP Training-cum-Facilitation Centre at KRC. Dr. G. Radhakrishnan, Project Leader, ERP and his team made a presentation on ERP activities at the Institute. DG-CSIR was delighted with the progress made in the implementation of ERP and congratulated the team members.

He had an interaction with the CSIR-800 and Brass Cluster teams and suggested the path forward. He also released a Hindi version of *CSIR@80: Vision & Strategy 2022* and commended the team members for this admirable initiative. DG-CSIR then attended a presentation on the Twelfth Five-Year Plan and had an interaction with the Administration Team consisting of COA, AO, FAO and SPO.



Glimpses of the visit of DG-CSIR

CSIR-NIIST is doing cutting edge research in frontier areas: Dr. Shashi Tharoor

Dr. Shashi Tharoor, Minister of State for Human Resource Development visited CSIR-NIIST, Thiruvananthapuram on 5 June 2013. Addressing the NIIST staff, he said that he was tremendously impressed by the world class research performed by CSIR-NIIST scientists.

“India is constantly criticized as being inhospitable to cutting-edge science. But I am proud and delighted that a research organization from my own constituency does quality research in frontier areas of high relevance. It is also commendable that the research conducted at CSIR-NIIST is anchored locally and oriented at finding immediate applications.” Social consciousness is the main factor that distinguishes Indian research institutes from their foreign counter parts, he added.

Later, he unveiled the technology products developed by CSIR-NIIST under the CSIR-800 programme, an



Dr. Shashi Tharoor, Minister of State for Human Resource Development addressing the audience

initiative of CSIR for income augmentation and improvement in quality of life of 800

million fellow Indians through interventions of science and technology. He said he was happy to launch the environment friendly products developed by CSIR-NIIST on World Environment Day.



Dr. Shashi Tharoor inspecting the polymer-coir composite developed by CSIR-NIIST

He inspected the polymer-coir composite developed by CSIR-NIIST as a promising substitute for wood, anaerobic digester and samples of natural fibres (pine apple leaf fibre, banana fibre, coir fibre etc.) extracted by the biological process developed at CSIR-NIIST. Dr. Tharoor said that he was really struck by the work done by CSIR-NIIST in developing the technology for extraction of natural fibres having extraordinary strength and durability.

Student Visits to CSIR-NEIST during January-June 2013

CSIR-North East Institute of Science and Technology (NEIST), Jorhat has always been proactive in promoting and motivating students to undertake careers in the exciting world of science. CSIR-NEIST encourages students of various schools, colleges and universities not only from Assam but from other states of the country also to visit the institute and interact with the scientists and researchers and familiarize themselves with

the ongoing R&D and extension activities.

At the request of the Deputy Commissioner, Jorhat district, CSIR-NEIST organized the visit of students under the Rashtriya Madhyamik Siksha Abhiyan (RMSA) programme, at its Institute during 21 March-5 April 2013. During the period, around 5000 students of secondary level (Class IX), along with their teachers from different schools of Jorhat district, visited the Institute. The visitors got an opportunity to know about the Institute's activities and interacted with the scientists.

In addition to the RMSA programme, during the first six months of the year 2013 (i.e., January to June) numerous batches of students from various educational institutes visited CSIR-NEIST. The students were taken around different divisions like the Medicinal, Aromatic & Economic Plants, Cellulose Pulp & Paper, Geosciences, Materials Science, Coal Chemistry, Natural Product Chemistry, Synthetic Organic Chemistry, Medicinal Chemistry and Biotechnology Divisions and were informed about various ongoing activities and how the institute's work is serving the nation as well as the society at large.



Dr. R.L. Bezbaruah (*extreme right*), Head-Information & Business Development Division interacting with the students and the faculty members of Gauhati University during the visit

Foundation Day

CSIR-Central Electrochemical Research Institute



The 66th Foundation Day of CSIR-CECRI, Karaikudi was celebrated with fervour on 25 July 2013. Dr. P.R. Vasudeva Rao, Director, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam was the Chief Guest. The function was presided over by Professor K.T. Jacob, IISc Bangalore (Chairman, Research Council of CSIR-CECRI).

Dr. N. Palaniswamy, Chief Scientist, CSIR-CECRI welcomed the gathering. Prof. Jacob delivered the presidential address.

Dr. Vasudeva Rao delivered the Foundation Day Lecture on *Chemistry for Fast Reactors and Associated Fuel Cycle*. He elaborated on the facilities being created at Kalpakkam for nuclear power generation. Expressing confidence on the generation of 500 MW and 100 MW in 2015 to begin with, he, however, cautioned on the availability of raw materials required for nuclear power. As the availability of coal will also not be sufficient, he stressed on the need for complementing nuclear power with



Dr. Vasudeva Rao delivering the Foundation Day Lecture

alternative sources like solar, wind, etc. , along with robust storage options.

Dr. Vijayamohan K. Pillai, Director, CSIR-CECRI honoured the Chief Guest and expressed his desire for closer ties with IGCAR through collaborative projects. Er. R. Meenakshisundaram, Senior Principal Scientist, CSIR-CECRI proposed the Vote of Thanks.

CSIR-Institute of Himalayan Bioresource Technology

CSIR-IHBT, Palampur celebrated its 31st Foundation Day on 10 June 2013. Dr. P.L. Gautam, Vice Chancellor, Career Point University, Hamirpur (HP) delivered the Foundation Day Lecture on *Biodiversity and Society*.

Dr. Gautam emphasized that biodiversity is critical for life, but it is declining at a fast rate. He said that all of us need to contribute to safeguard it for our present and future generations, and emphasized the role of different stakeholders in conserving, documenting and protecting bioresources of different regions. He further expressed the need for assessment of footprint for sustainability.

On the occasion, Dr. Paramvir Singh Ahuja, Director, CSIR-IHBT, delivered the



Dignitaries releasing CSIR-IHBT's Annual Report 2012-13

Welcome Address and presented the Director's Report for the year 2012-13. He projected the activities carried out by the institute during 2012-13. He also informed

about the establishment of a Center for High Altitude Biology at Ribling and the activities pertaining to establishment of germplasm resource, deciphering adaptive mechanism of high altitude plants and launching of nutri-bar prepared using local resources.

Dr. Ahuja further mentioned about the *in silico* integrative network biology

approach to identify drug targets for asthma, synthesis of nanocatalyst and improvement in processing for obtaining 90% pure steviol glycoside. The work done for promotion of apple industry for Jammu & Kashmir and Himachal Pradesh was also emphasized. Development of novel rose cultivar was highlighted.

Dr. P.L. Gautam released the *Annual Report 2012-13*. During the year, the institute developed two cultivars of ornamental rose viz. attractive purple *Himalayan Glory* and unique thornless red *Himalayan Wonder*. A technical brochure on these roses was released by Dr. Gautam.

On the occasion, a documentary of CSIR-IHBT prepared by Mr. Gauhar Raza and his team from CSIR-NISCAIR, was also screened.

The function was attended by faculty and students of CSK-HPKV, Palampur, and dignitaries from the regional stations of IVRI and IGFRI.



Dignitaries releasing technical brochure on *Himalayan Glory* and *Himalayan Wonder*

World Environment Day

World Environment Day celebrated at CSIR-CBRI

The CSIR-Central Building Research Institute (CBRI), Roorkee celebrated the World Environment Day on 5 June 2013 to promote awareness about the importance of

preserving our biodiversity, the need to identify problems related to the environment and ways to take corrective action.

It was on this day in the year 1972 that the United Nations Conference on the Human Environment was formed. First celebrated in 1973, World Environment Day, also popularly known as Environment Day, seeks to look for solutions to tackle environmental challenges that include climate change, global warming, disasters and conflicts, harmful substances, environmental governance, ecosystem management and resource efficiency. The theme for this year's World Environment Day was *Think, Eat & Save*.

Think, Eat & Save is an anti-food waste and food loss campaign that encourages us to reduce our food print. According to the UN Food and Agriculture Organization (FAO), every year 1.3 billion tonnes of food



Prof. S.K. Bhattacharyya, Director, CSIR-CBRI planting trees

is wasted. At the same time, 1 in every 7 people in the world go to bed hungry and more than 20,000 children under the age of 5 die daily from hunger. Given this enormous imbalance in lifestyles and the resultant devastating effects on the environment, this year's theme encourages us to become more aware of the environmental impact of the food choices we make and empowers us to make informed decisions.

During the celebrations at CSIR-CBRI, Chief Guest Dr. Neelima Jerath, Executive Director, Punjab State Council for Science and Technology, Chandigarh, Prof. S.K. Bhattacharyya, Director CSIR-CBRI and Prof. B.R. Gurjar, Chairman IE (I), RLC planted trees in the CSIR-CBRI Campus as a gesture of harmonious living with nature.

Dr. Neelima Jerath expressed happiness to be amongst distinguished scientists. She mentioned that every human being should contribute a little in their own personal way to protect the environment. In this connection, she appreciated the initiatives taken by CSIR-CBRI for taking environmental issues seriously and also proposed that both CBRI and PSCST can have joint projects on the environmental

problems facing Uttarakhand.

Earlier, Prof. S.K. Bhattacharyya, Director, CSIR-CBRI, in his Presidential Address, apprised that unlike the previous years, different trees were chosen this year for plantation. In his address, Prof. Bhattacharyya mentioned that CSIR-CBRI would continue its activities to develop environment-friendly technologies and pursue research to protect the environment and work for conservation of biodiversity of the region.

On this occasion, two CBRI publications – *Newsletter* and *Bhavnika* – were also released by dignitaries.



CBRI publications being released at the function

Lectures

Prof. C.N.R. Rao delivers *Sir Shanti Swaroop Bhatnagar Distinguished Lecture* at CSIR-NCL

CSIR-National Chemical Laboratory (NCL), Pune has instituted the *Sir Shanti Swaroop Bhatnagar Distinguished Lecture Series* to honour the contributions made to science by Sir Shanti Swaroop Bhatnagar, Founder Director General, CSIR (1942-1954). The Inaugural Lecture was delivered by Prof. C.N.R. Rao on 24 May 2013 centered on *The Celebration of Science – Glorious Past and Challenging Future*.

Prof. Rao, in his very inspiring talk, said that science has been very important for human life. He focused on the crucial inventions made in science and how they changed the journey of science. He informed about the major discoveries made early in the twentieth century and their centenaries

celebrated recently. He described the contributions of many great scientists such as J.C. Bose, Ernest Rutherford, Albert Einstein, Madam Curie, Werner Heisenberg, Shanti Swaroop Bhatnagar, Laurence Bragg, Antoine Lavoisier, Michael Faraday, Dmitri Mendeleev, Linus Pauling, Gilbert N. Lewis, C.V. Raman, Irving Langmuir, James Clerk Maxwell, etc.



Prof. C.N.R. Rao delivering the talk

Remembering Rutherford's work on discovery of the atomic structure in 1911 and its impact on science, Prof. Rao said that his contribution opened doors of several branches of science. He talked about the importance of the first Solvay Conference which took place in the same year. He also revealed facts behind the discoveries of radioactivity, noble gases, chemical bond, quantum chemistry, superconductivity, and X-ray crystallography. He described Michael Faraday as the greatest experimental scientist

of all times. Faraday was a scientist who never worked for honour but for the cause of science.

Prof. Rao said that the energy crisis is a major problem today and we need to find sustainable alternatives. The role of chemistry is very important to overcome this calamity. He emphasized on the need to work in areas such as the generation of energy and its storage. We need to utilize sources like hydrogen, solar energy and fuel cell, he said. He reminded the audience about the words of Jules Verne who had said "one day water will work as fuel; it will be the coal of future".

Prof. Rao mentioned that though chemistry is an old subject and modern chemistry is just 200 years old, it has brought about great changes during the last one hundred years.

Earlier, Dr. Sourav Pal, Director, CSIR-NCL, remembered the contributions of Sir Shanti Swaroop Bhatnagar and his leadership in creating the CSIR. Bhatnagar was a great visionary who not only dreamt of a remarkable organization but also strived to turn it into reality. His role in establishing a chain of National Research Laboratories was important.



Dr. Sourav Pal, Director, CSIR-NCL offering a memento to Prof. C.N.R. Rao

Diamond Jubilee Lecture held at CSIR-NBRI

In the series of Diamond Jubilee Lectures at CSIR-National Botanical Research Institute (NBRI), Lucknow, Dr. K.C. Gupta, Director, CSIR-IITR, Lucknow, delivered a lecture on *Polysaccharide-decked non-viral vectors for efficient delivery of biomolecules in-vitro and in-vivo* on 7 June 2013. Dr. C.S Nautiyal, Director, CSIR-NBRI, Lucknow, welcomed the speaker, scientists and students present on the occasion.

In his lecture, Dr. K.C. Gupta, said that development of efficient and safe non-viral vectors is one of the essential requirements for the success of efficient drug and gene delivery. He told the audience that his institute has evaluated the gene transfer capability of polysaccharide (chitosan)-PEI conjugates (CP) prepared by conjugating low molecular weight branched polyethylenimine



Dr. K.C. Gupta delivering the lecture

(LMWP) with depolymerized chitosans (7 and 10 kDa) via their terminal aldehyde/keto groups. The CP conjugates interacted efficiently with nucleic acids and also showed

higher cellular uptake.

On complexation with DNA, these conjugates yielded nanoparticles in the size range of 100-130 nm (in case of C7P) and 115-160nm (in case of C10P), which exhibited significantly higher transfection efficiency (~ 2–42 fold) *in vitro* compared to chitosans (high and low molecular weight and the commercially available transfection reagents retaining cell viability almost comparable to the native chitosan. Of the two CP conjugates, chitosan 7 kDa-LMWP (C7P) displayed higher gene transfer ability in the presence and absence of serum. Luciferase reporter gene analysis in male Balb/c mice receiving intravenous administration of C7P3/DNA polyplex showed the maximum expression in their spleen.

Further, tuftsin, a known macrophage targeting molecule, was tethered to C7P3 and the resulting complex exhibited significantly higher gene expression in cultured mouse peritoneal macrophages as compared to unmodified C7P3/DNA complex. This complex does not show any cytotoxicity demonstrating the suitability of the conjugate for targeted applications.

Dr. Gupta further said that for nanoparticulate based drug delivery, his group has developed Doxorubicin (DOX) loaded targeted nanoparticles for targeted

drug delivery in tumor tissue. DOX is a well-known anticancer drug used for the treatment of a wide variety of cancers. However, undesired toxicity of DOX limits its uses. To address the issue of minimizing toxicity of DOX by making it targeted towards cancer cells, DOX was entrapped in self-assembled 6-O-(3-hexadecyloxy-2-hydroxypropyl)-hyaluronic acid (HDHA) nanoparticles.

The anticancer efficacy of DOX loaded HDHA nanoparticles was evaluated by measuring the changes in tumor volumes, tumor weights, and mean survival rate of Swiss albino mice grafted with Ehrlich's ascites carcinoma cells. For this, the animals were given HDHA-DOX nanoparticles intravenously and a green tea polyphenol, Epigallocatechin-3-gallate (EGCG) orally through gavage. The targeted nanoparticle dose with EGCG significantly increased mean survival time of the animals and enhanced the therapeutic efficacy of the drug compared to the non-targeted nanoparticles and free DOX. Dr. Gupta concluded that HDHA-DOX NPs along with EGCG significantly inhibit the growth of carcinoma cells with ~ 38-fold dose advantage compared to DOX alone, and thus opens a new dimension in cancer chemotherapy.



Honours and Awards

CSIR-IICT Researcher bags ICMR Prize for Biomedical Research

Prof. Upadhyayula Suryanarayana Murty, Chief Scientist and Head, Biology Division of CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad has bagged the prestigious *ICMR Prize for Biomedical Research Conducted in Underdeveloped Areas* for the year 2010. The award was instituted by the ICMR Council in 1983, to be awarded to scientists who have contributed significantly in any field of Biomedical Sciences in underdeveloped areas.

Prof. U.S.N. Murty was conferred with this award in recognition of his outstanding

contribution in the area of *Integrated Control of Vectors and Vector Borne Diseases* in North Eastern States of India. The specific focus of Dr. Murty's efforts is in socially relevant programmes. He has made significant contributions in the area of integrated control of vectors and Vector Borne Diseases (VBD) like Malaria, Filariasis and Japanese encephalitis. His research group has successfully executed several research programmes in Assam, Manipur, Mizoram,



Sikkim, Arunachal Pradesh, etc. Dr. Murty has contributed significantly to the North East region and successfully implemented challenging projects supported by the concerned state governments.

The award carries a citation and a cash

prize of ` 20,000. It will be presented by the Minister of Health and Family Welfare, Government of India, Shri Ghulam Nabi Azad in the presence of Dr. Vishwa Mohan Katoch, Director General ICMR, Government of India, at New Delhi.

Indo-US S&T Fellowship 2013 awarded to CSIR-NGRI Scientist



Dr. Uma Shankar, Senior Scientist at CSIR-National Geophysical Research Institute (NGRI), Hyderabad has been awarded the Indo-US Research Fellowship for the Year 2013. His research interests lie in the emerging field of delineation and assessment of gas hydrate, which is a fusible major energy resource for the future.

Dr. Shankar used marine 2D/3D seismic data to map the bottom simulating reflector (BSR) and developed a technique to predict heat flow from the BSR to understand the genesis of gas hydrates. He has developed maps of gas hydrate stability thickness and regional heat flow in the Krishna Godavari (KG) Basin and Mahanadi Basin, eastern Indian margin and Andaman Sea. Further, he used the available log data to make regional assessment for volumetric gas hydrate in the KG basin. He used rock physics (effective medium theory) to the P-wave velocity data and Archie's relation for electrical resistivity

log data for the quantification of gas hydrates. Besides, he carried out acoustic impedance inversion and estimated gas hydrate through rock physics modeling.

Dr. Shankar obtained his M.Sc. (Tech.) in Geophysics in 1999 from the Banaras Hindu University (BHU), Varanasi and was awarded the Ph.D. degree in 2006 from the Osmania University, Hyderabad on non-conventional energy resource entitled *Assessment of Gas Hydrate Resources in the Kerala-Konkan Basin – Western India*.

Dr. Shankar has published 25 articles in peer-reviewed journals of national and international repute. He has been recognized with the prestigious BOYSCAST fellowship (2008-09) from the Department of Science & Technology (DST), Govt. of India. He was also awarded with the Young Scientist Award (2010-2011) of the Council of S&T, Uttar Pradesh and is an Associate Fellow of Andhra Pradesh Akademi of Sciences.

CFTRI Scientist Honoured with Fellowship of Indian National Academy of Engineering



Dr. K.S.M.S. Raghavarao, Chief Scientist, CSIR-Central Food Technological Research Institute (CFTRI), Mysore has been elected a Fellow of the prestigious Indian National Academy of Engineering by its Council, effective from 1 January 2013. The Indian National Academy of Engineering is the premier association of academic engineers and recognizes outstanding personal contribution by engineers through Fellowships. Dr. Raghavarao has received the honour for his research contribution in the area of Chemical Engineering. A scientist-

engineer for the past 25 years, Dr. Raghavarao has published more than 155 research publications in national and international journals. He has 25 International patents and 50 Indian patents and 20 processes to his credit and has guided 18 students for PhD degree. Dr. Raghavarao was Fellow of the Institution of Engineers (2010) and recipient of National Academy of Sciences, India (NASI)-Reliance Industries Award (2008), National Award, Ministry of Agriculture (2006) and Institution of Engineers Platinum Jubilee Award (2010).

Obituary

Eminent CSIR-CFTRI Scientist Passes Away

Dr. H.A.B. Parpia, renowned food scientist and former Director of the CSIR-Central Food Technological Research Institute (CFTRI), Mysore passed away on 9 July 2013. He was 91 years old. Dr. Parpia leaves behind memories of a distinguished career in science and social activism spanning several decades.

Born on 5 September 1922 in Mumbai, Dr. Parpia studied Microbiology (Industrial and Medical) and Chemistry from the University of Bombay, Food Technology at the University of California and then moved to the Oregon State University, USA for a Ph.D.

With a doctorate in hand he returned to Mumbai for a job in the Food Industry as Chief Technologist. As research beckoned, Dr. Parpia joined CSIR-CFTRI as Assistant Director in 1956 looking after Information, Statistics, Process Development and Food Plant Design. He also held a position as consultant at Food and Agriculture Organization (FAO) of the United Nations at Rome. He served as Assistant Director-General of the Council of Scientific and Industrial Research in 1959 and was in-charge of Industrial Liaison Office and Extension, Delhi.

Recognizing his abilities, the government of India requested him to work as Chief Defence Research Coordinator of the CSIR during the India-China war of 1962. Subsequently, he became Director of the CSIR-CFTRI, in 1963.

Under his stewardship, CSIR-CFTRI developed Amul (Babyfood from Buffalo milk) which had a great success story and also vegetable milk (Miltone) from groundnut kernels. He led the Institute on to the global platform with the establishment of the FAO International Food Technology Training Institute (IFTTC) in November 1964 for training food processing professionals in south and south east Asia on various aspects of food science. The course has since transformed into a full-fledged post-graduate course (MSc Food Technology), a unique and globally recognized professional course for food professionals.

Dr. Parpia was the Principal Advisor, U.N. Conference on Science and Technology for

Development, New York, from 1978-82. He was appointed Director of Planning and Evaluation at the United Nations University headquarters in Tokyo in 1981, was a visiting lecturer at the Massachusetts Institute of Technology from 1967 to 1978, and was also Chairman of Protein-Calorie Advisory Group of the UN System.

Dr. Parpia's academic achievements include nearly 250 papers and documents written on research and development in food science and technology, nutrition food policy, and industrial feasibility. He holds five international patents in food science.

He is a recipient of many prestigious awards such as Industrial Achievement Award from the Institute of Food Technologists (IFT) USA, Kashalkar memorial award for outstanding services to Indian Food Industry from All India Food Processors Association (AIFPA), Distinguished service medal from Prime Minister of India at the 25th Anniversary of CSIR-CFTRI, V. Subrahmanyan's Industrial Achievement award instituted by the Association of Food Scientists and Technologists (AFST), India and Wattumull Foundation Award, Hawaii, USA.

Apart from being a scientist par excellence, Dr. Parpia is also remembered for the humanist that he was. When it came to education, he was keen on women's empowerment and study. His counsel was sought by Government and other Institutions in the fields of education, food processing and civic amenities. Several of the educational reforms in the Karnataka state follow his counsel and he is remembered for his strong advocacy for setting up a separate ministry for Food Processing industries.



Dr. H.A.B. Parpia (right) explaining the intricacies of traditional packaging to Dr. Zakir Hussain, former President of India during his visit to CSIR-CFTRI. Also seen in the background are Shri D. Devaraj Urs, the then Chief Minister of Karnataka (middle) and Shri V.V. Giri, the then Vice-President of India

Ms. Deeksha Bist Assumes Charge as Acting Director, CSIR-NISCAIR



Ms. Deeksha Bist assumed the charge as Acting Director of CSIR-National Institute of Science Communication and Information Resources (NISCAIR), New Delhi with effect from 14 August 2013.

Ms. Bist has been the Head of the Popular Science Division, the Rajbhasha Division and the Print-Production Division in CSIR-NISCAIR. She has more than thirty three years of experience in science writing, editing, and publishing. She was earlier Editor of the monthly Hindi popular science magazine *Vigyan Pragati* with which she was associated for 17 years. She is currently Editor of *CSIR Samachar* and *Bharat ki Sampada*.

Ms. Deeksha Bist has written more than 600 articles that have been published in leading newspapers, magazines and journals, has delivered more than 350 S&T based radio talks and lectures on science communication and other S&T topics, and edited several books on scientific topics. She has also been Chairperson/Member of

several national committees.

Ms. Bist is member of prestigious associations such as the Indian Science Writers Association, Indian Women Scientist Association, Kendriya Sachivalaya Hindi Parishad, Vigyan Parishad, Prayag, Society for Publication and Advancement of Science Education, and Lekhika Sangh.

Ms. Deeksha Bist has several honours to her credit. She was honoured with a citation and Public Honour by Manav Sewa Parishad, New Delhi (1991); conferred *Vigyan Shree* by Vigyan Parishad, Prayag for popularising S&T (1997), *Whitaker Vigyan Puraskar-1998* by Vigyan Parishad, Prayag for excellence in popular science writing, *Bharat Ki Mahan Suputri* citation and public honour by Akhil Bhartiya Manav Sewa Parishad, New Delhi in 1998, *Himwant Kavi Chandra Kunwar Bartwal Samman* by Kedarkhand Sanskritik Sansthan, Mussoorie (2002) for excellence in science writing in Hindi, *Vigyan Lekhan Shree Samman* by Bal Prahari, Almora, Uttarakhand for excellence in science writing for children (2006) and *Sh. Dilip M. Salvi ISWA National Award for Science Popularisation* by ISWA, New Delhi (2012).

Forthcoming Events

- 1. Entrepreneurial Training on Aloe Vera Processing (AVPT-2013):** 26-29 November 2013, Contact Director, CSIR-Central Institute of Medicinal and Aromatic Plants, P.O. CIMAP, Kukrail Picnic Spot Road, Lucknow-226 015; E-mails: director@cimap.res.in; s.tandon@cimap.res.in.
- 2. 3rd-Indian Antarctic Expedition – 30 Years Celebrations:** 3 December 2013 (Hosted jointly by NIO and NCAOR), Contact: Shri V.S. Samy, IT-Head, NCAOR (vssamy@ncaor.gov.in) or Dr. A.K. Saran, NIO (saran001@gmail.com/saran@nio.org); For more information visit: www.ncaor.gov.in/news/view/182.

Printed and Published by

Deeksha Bist on behalf of CSIR-National Institute of Science Communication And Information Resources
Dr K.S. Krishnan Marg, New Delhi -110 012 and printed at NISCAIR Press
Dr K.S. Krishnan Marg, New Delhi -110 012

Editor: Hasan Jawaid Khan; **Editorial Assistance:** Neelima Handoo & Vrishali Subramanian

Design: Neeru Sharma & Sarla Dutta; **Production:** Supriya Gupta

Phone: 25848702; Fax: 25847062; E-mail: csirnews@niscair.res.in; hjk@niscair.res.in

Website: <http://www.niscair.res.in>

Please direct all Subscription-related queries to:

Sales & Distribution Officer, NISCAIR; E-mail: sales@niscair.res.in; Phone: 25843359

Annual Subscription: Rs 500; Single Copy: Rs 50.00

RN 4512/57