



ISSN 0409-7467



CSIR News

NEWSLETTER OF THE COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

Volume 72 No. 3

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

March 2022

In The News

AIIMS and CSIR-IIIM Sign MoU for Scientific Collaboration



Dr Jitendra Singh, Union Minister of State (Independent Charge) S&T, visited the All India Institute of Medical Sciences (AIIMS) Jammu, on 29 January 2022 to inaugurate the newly developed facilities and inspect the upcoming new blocks. During the visit, the Hon'ble Minister also announced that CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu and AIIMS, Jammu, will work in close association.

In the spirit of intellectual cooperation, scholarly exchange, and the development of a fruitful partnership, CSIR-IIIM and AIIMS signed a Memorandum of Understanding (MoU) to collaborate on related matters of mutual interest that may emerge over time.

The purpose of the cooperation is to promote collaborative research, development and to facilitate the exchange of ideas, development of

The main aim of the seminar was to promote new initiatives in science communication and motivate prospective science communicators to design, plan and execute science communication projects.

new knowledge, and to enhance high-quality research acumen. The major thrust areas of the understanding on which the parties will cooperate are:

1. Research and Development in the area of mutual interest
2. Undertaking collaborative projects
3. Skill and capacity-building/development

4. Dissemination of knowledge
5. Linkage with entrepreneurs & start-ups for joint mentoring and incubation.

The MoU was signed in the presence of the Hon'ble Minister, between AIIMS Director, Dr Shakti Gupta and CSIR-IIIM Director, Dr D. Srinivasa Reddy.

National Seminar "Nurturing Science Communication – Motivating Science Communicators"

"Distilling correct scientific information is a huge challenge and here science communication has a big role to play": — Prof. K. VijayRaghavan, PSA, Govt of India

CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), New Delhi, organised a national seminar on the theme "Nurturing Science Communication — Motivating Science Communicators" on 10 March 2022 in hybrid mode at the CSIR-National Physical Laboratory (CSIR-NPL) auditorium, New Delhi.

The chief guest of the seminar was Prof. K. VijayRaghavan, Principal Scientific Adviser to Govt of India. DG-CSIR, Dr Shekhar C. Mande; Dr Venugopal Achanta, Director, CSIR-NPL; Prof. Avanish Kumar Srivastava, Director, CSIR-AMPRI and Dr Sharmila Mande, Distinguished Chief Scientist, TCS Research, Tata Consultancy, apart from Prof. Ranjana Aggarwal, Director, CSIR-NIScPR also graced the programme.

The seminar brought together several institutions engaged in science communication on a single platform to share their views and ideas for strengthening the science communication efforts in the country. A first of its kind event, the National Seminar provided an opportunity to science communication institutions and science communicators to meet

and network to motivate and nurture science communication and science communicators. The main aim of the seminar was to promote new initiatives in science communication and motivate prospective science communicators to design, plan and execute science communication projects. The seminar also spread awareness about agencies/institutions promoting and funding science communication initiatives in India and also attempted to showcase selected science communication initiatives.

Highlighting the various challenges in science communication, Prof. K. VijayRaghavan briefly discussed the four major points associated with science communication — Why to Communicate?, Who to Communicate?, How to Communicate? & How not to Communicate? Shedding light on the importance of the right information to be communicated, he said that in today's world communication happens at a high speed in a manner never seen before in human history. And so, if correct information is not communicated to the target audience it may lead to misinformation & manipulation of information.



Prof. VijayRaghavan, addressing the gathering

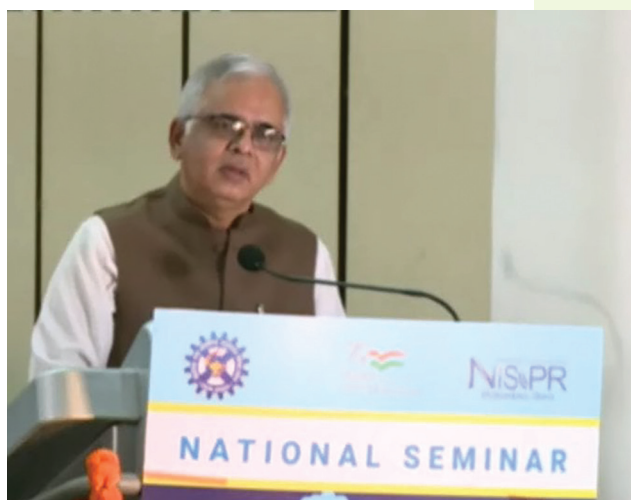
Fundamentally, communication of authentic information is critical in science communication, he added. Further, he said that these days too much information is available, but focused communication with an ability to distil the garbage is a crucial challenge. Disinformation and misinformation are easy to communicate, as they do not have any credibility, but transmitting correct and scientific information is a bigger issue, emphasised Prof. VijayRaghavan.

Concluding his address, Prof. VijayaRaghvan said that we need to communicate the impact of science on society and the economy for which detailed work needs to be done and that knowledge no longer is concentrated with those who have power but is democratised.

Appreciating the efforts to organise this seminar, Dr Shekhar C. Mande, DG-CSIR said that this seminar addresses the need for all to be better communicators, and create a better interface between scientists and society. Talking about the activities/discoveries/researches by scientists and technologists, Dr Mande said that involving the general public to make them acquainted with the work being done in labs is an extremely important aspect of S&T and

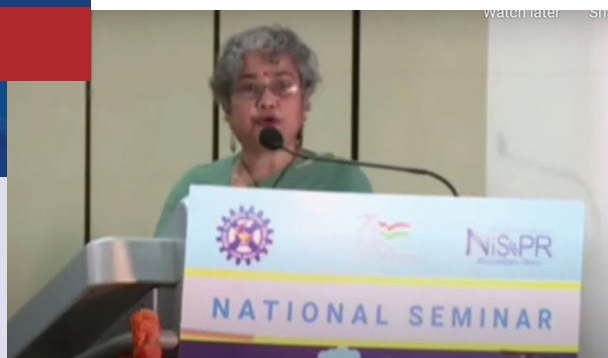
that's where science communicators have a major role to play. Further, he added that India is woefully short of people able to effectively connect with the public about S&T, therefore, organising seminars such as this would go a long way towards motivating people to take up science communication as a career and inform the public about what happens behind the walls of the laboratories and their implications for our future.

Dr Shekhar C. Mande, DG-CSIR said that this seminar addresses the need for all to be better communicators, and create a better interface between scientists and society.



Dr Shekhar C. Mande, DG, CSIR

Congratulating the organising team, Dr Sharmila Mande cited several examples and explained the importance of communicating with people in an easily understandable language. She said

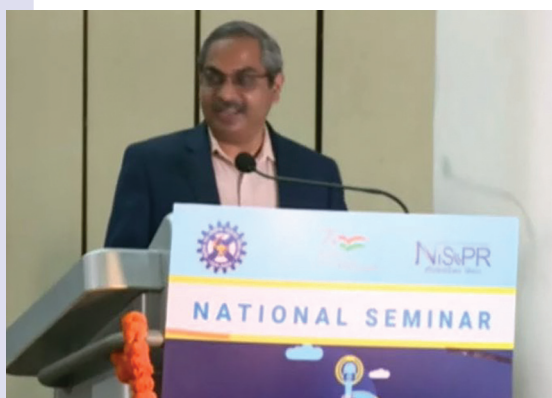


Dr Sharmila Mande, Distinguished Chief Scientist with TCS Research

Prof. Venugopal Achanta said that science communicators should not focus only on reporting research published in foreign journals. There is considerable research being carried out on local problems which need to be communicated as well.

that science communication is important not just to communicate to students but also to clinicians as sometimes they are not aware of the research going being busy with their clinical work. Further, she added that scientific endeavours need to be made known in a simplistic manner in the form of books, animations, etc. to connect with the general public more conveniently.

During his address, Prof. Venugopal Achanta said that science communicators should not focus only on reporting research published in foreign journals. There is considerable research being carried out on local problems which need to be communicated as well. Discussing the problems associated with fancy journals he said that as a nation we should look at our own needs, aspirations & research which are targeted towards local challenges and needs and for this science communication has a big role to play.



Prof. Venugopal Achanta, Director, CSIR-NPL

Discussing science communication by hardcore scientists and researchers, Prof. Avanish Kumar said that sometimes it becomes difficult for the general public to understand when hardcore scientists explain their work in jargon language which is not easily understandable. He said that to overcome this we need to have a path and in that direction, this seminar aligns very well as it brings closer the scientists and science communicators. Setting the tone with science communication he also highlighted the importance of all three popular science magazines namely *Science Reporter*, *Vigyan Pragati* & *Science Ki Duniya* published by CSIR-NIScPR. He said that although the magazines are popular among the masses but they need to be made more popular by increasing their circulation.

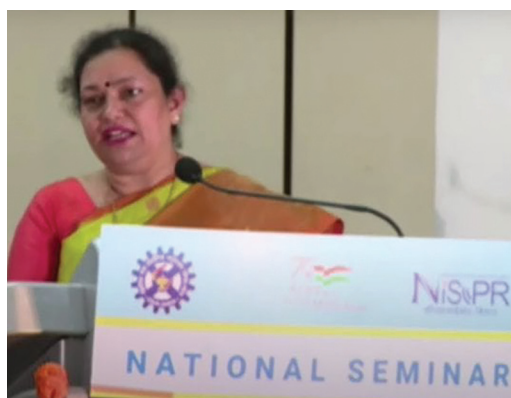
Earlier in her welcome address, Prof. Ranjana Aggarwal, Director, CSIR-NIScPR elaborated on the institute's commitment to providing the correct information in the right manner with the engagement of society. The challenge is to produce new science communicators and writers. She emphasised the need for much more science-based stories than research papers alone from the scientific community that can impact society.

During the inaugural session, dignitaries released some special publications of CSIR-NIScPR including the *National Seminar Theme Book*, Report



Prof. Avanish Kumar, Director, CSIR-AMPRI

on “*Women in STEM: A CSIR survey towards Gender Parity*” by Dr Ranjana Aggrawal, Dr Sandhya Wakdikar & Dr Praveen Sharma and March 2022 special issues of *Science Reporter* & *Vigyan Pragati* on women in science brought out on the occasion of the International Women’s Day (8 March). Besides, two science publications by two CSIR-NIScPR scientific staff were released: “*Mere Chuninda Vigyan Lekh*” authored by Dr Manish Mohan Gore, Scientist, CSIR-NIScPR and “*Vaigyanik Jagdish Chandra Bose Ke Mahaan Vichaar*” by Sawan Kumar Bag, Post Doctoral Fellow, Bar-Ilan University, Israel and Dr Meher Wan, Scientist, CSIR-NIScPR.



Prof. Ranjana Aggarwal, Director, CSIR-NIScPR

The inaugural session concluded with a vote of thanks by Mr Hasan Jawaid Khan, Chief Scientist, CSIR-NIScPR.

The seminar comprised two sessions. The first session was “Promoting Science Outreach & Communication” and was chaired by Dr Rajeev Kumar Mehajan, Scientist-G, SERB. The panellists of the session were Dr Jyotsna Dhawan, CEO, DBT/Wellcome Trust India Alliance; Dr C.M. Nautiyal, Programme Consultant (Science Communication), Indian National Science Academy (INSA); Dr Anurag Kumar, Director, Science City, Kolkata, National Council of Science Museums (NCSM); Dr Santosh Shukla, In-charge Officer (Science



Release of special S&T publications

Popularization) National Academy of Sciences India (NASI); Shri Nimish Kapoor, Scientist, Vigyan Prasar, DST and Dr Rohini Garg, Member, Indian National Young Academy of Sciences (INYNAS). Representing various organizations, the panelists presented the efforts being made to promote science outreach and communication in various ways and also the support being offered for science communication programmes.

The second session focused on “Innovative Science Communication Initiatives — A Showcase” and was chaired by Dr C.M. Nautiyal, Programme Consultant (Science Communication), Indian National Science Academy (INSA). The expert speakers of the session were Dr Rashmi Sharma, Scientist, DST speaking on “Augmenting Writing Skills for Articulating Research (AWSAR)”; Dr Arvind C. Ranade, Scientist, Vigyan Prasar presenting highlights of the VIPNET programme of Vigyan Prasar; Shri Kapil Tripathi, Scientist, Vigyan Prasar talking about India Science Channel being run by Vigyan Prasar; Shri Tarun Kumar Jain, Editor, *Vaigyanik Drishtikon* who gave details about India’s first S&T newspaper; Shri Zubair Siddiqui from Eklavya, Bhopal, who gave insights into the *Srote*

Prof. Ranjana Aggarwal, Director, CSIR-NIScPR elaborated on the institute's commitment to providing the correct information in the right manner with the engagement of society. The challenge is to produce new science communicators and writers.

Dr Geetha Vani Rayasam said that the pandemic has shown that science communication is essential, be it the hesitancy, vaccination, COVID tests, etc.



From L-R: Dr Rohini Garg, Shri Nimish Kapoor, Dr Satosh Shukla, Dr Rajeev Mehajan & Dr C M Nautiyal

Science & Technology Features; and Ms Sonali Nagar, Scientist, CSIR-NIScPR talking about the science popularization activities of CSIR-NIScPR.

The valedictory session was chaired by Dr Nakul Parashar, Director, Vigyan Prasara. Mr Hasan Jawaaid Khan, Chief Scientist, CSIR-NIScPR presented the summary of the seminar. Guest of Honour, Dr Geetha Vani Rayasam, Head, CSIR-HRDG said that the pandemic has shown that science communication is essential, be it the hesitancy, vaccination, COVID tests, etc. Guest of Honour, Dr Rashmi Sharma, Scientist, DST, said that science communication plays a very vital role in society and during the pandemic time, we saw how science communicators



From L-R: Ms Sonali Nagar, Shri Zubair Siddiqui, Shri Tarun Kumar Jain, Dr C.M. Nautiyal, Shri Kapil Tripathi, Dr Arvind C. Ranade and Dr Rashmi Sharma

worked hard to provide authentic scientific information. Lastly, the vote of thanks was proposed by Dr Manish Mohan Gore, Scientist, CSIR-NIScPR.

On the same day, in view of the International Women's Day (8 March), CSIR-NIScPR also organised the "CSIR Women Scientists Meet" at CSIR-NPL, New Delhi. During the programme, a half-day workshop on "Women leaders in CSIR: Experiences on work-life balance" was held where women holding headships in various CSIR scientific divisions shared their experiences on balancing work with life. In the workshop, around 50 women staff and students of CSIR-NIScPR and CSIR-NPL attended.



Visit of Shri Lok Nath Sharma, Hon'ble Minister, Government of Sikkim to CSIR-IHBT

Shri Lok Nath Sharma, Honourable Minister, Department of Agriculture, Horticulture, Animal Husbandry and Veterinary Services, Information &



Public Relations, Printing and Stationery Departments, Government of Sikkim along with Shri Bhim Lal Dahal, Additional Director, Horticulture visited CSIR-Institute of Himalayan Bioresource Technology, Palampur, Himachal Pradesh, on 17-18 February 2022.

During the visit, Shri Lok Nath Sharma appreciated the contribution made by the institute through the development of high-end research-based technologies and their deployment for boosting the rural economy. He showed keen interest in establishing a CSIR-IHBT centre in Sikkim for fast deployment of relevant technologies, training and skill development to strengthen ongoing development programmes for the benefit of the people of Sikkim.

Besides Heeng, Saffron, Monk Fruit and Cinnamon introduction, he lauded the efforts of CSIR-IHBT for initiating the cultivation of pearl integrated with aquaculture. Honourable Minister also said that his visit to CSIR-IHBT will further strengthen the cooperation on various aspects including hydroponics and aeroponics, cultivation of asafoetida, saffron, aromatic and medicinal plants, floriculture and food processing that help in capacity building among farmers, unemployed youth and entrepreneurship development.

He also talked about the success of schemes like 'Mukhyamantri Krishi

Atmanirbhar Yojana', 'Mukhyamantri Pashudhan Samridhi Yojana' and 'Mukhya Mantri Matsya Utpadan Yojana' reforming the lives of the common man and making Sikkim the first organic state of the nation. Honourable Minister also visited fields and facilities like food processing, pilot-scale herbal processing, aeroponics and hydroponics technologies developed at the institute.

Dr Sanjay Kumar, Director, CSIR-IHBT, presented the major achievements and research activities of the institute. He said that the institute is playing a significant role through judicious utilisation of available resources like cultivating and processing aromatic crops like wild marigold, damask rose, lemongrass, etc. enabling self-reliance among farmers with increased income.

He further said CSIR-IHBT is closely working with North-East states by developing clusters for the production of vitamin D2 enriched shiitake mushroom and vermicomposting under Scheme of Fund for Regeneration of Traditional Industries (SFURTI), anaerobic Biogas plant installation through the Department of Science & Technology (DST), Waste Management Technologies (WMT) and establishment of essential oil processing unit under the CSIR Aroma mission. Dr Kumar informed that CSIR-IHBT has initiated research and development activity on pearl culture utilising



Shri Lok Nath Sharma appreciated the contribution made by the institute through the development of high-end research-based technologies and their deployment for boosting the rural economy.

fresh water mussels to promote its cultivation through trainings & skill development and facilitate farmers, entrepreneurs/startups in this high income-generating venture.

During the visit of the Honourable Minister, CSIR-IHBT and Department of Horticulture, the Government

of Sikkim signed a Memorandum of Understanding (MoU) on 18 February 2022. The main purpose of this MoU is to create more high revenue-generating livelihood options for the people of Sikkim and rural development deploying technologies developed at CSIR-IHBT.

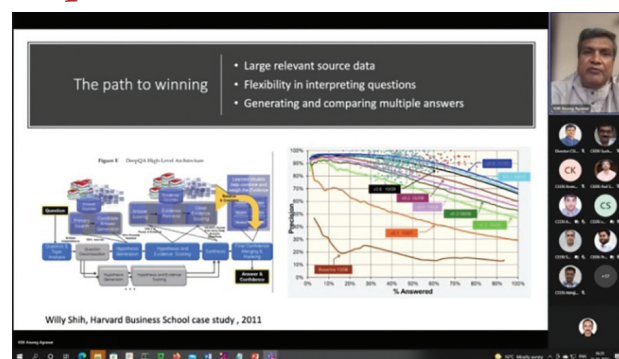
CSIR-CEERI Organises Webinar

Jigyasa Vigyan Mahotsav 2022: Artificial Intelligence Theme – Boot Camp-I



BootCamp-I Jigyasa Vigyan Mahotsav 2022

A Webinar was organised at CSIR-Central Electronics Engineering Research Institute, Pilani (CSIR-CEERI) under the Jigyasa Vigyan Mahotsav 2022 on 12 January 2022. The Webinar consisted of an Invited lecture by renowned genome scientist Dr Anurag Agrawal, awareness about the



Dr Anurag Agrawal explaining AI

lecture on the topic “Not So Elementary: AI and Health”.

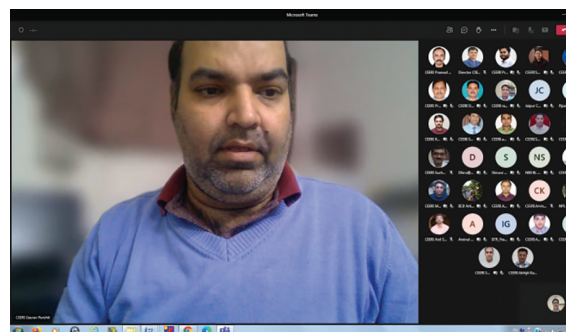
The webinar was presided over by Dr P.C. Panchariya, Director, CSIR-CEERI.

In the lecture, Dr Anurag Agrawal underlined the importance of AI and genomics in the diagnosis and treatment



Dr Anurag Agrawal interacting with Dr P.C. Panchariya and Mr Pramod Tanwar during the session

BootCamps followed by a Scientific Quiz session for the students. Dr Anurag Agrawal from CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB), New Delhi, delivered his



Dr Gaurav Purohit during the quiz session

of diseases. He told the audience that in the early stages of COVID when the Alpha variant was spreading, the CSIR-CEERI team along with CSIR-IGIB labs played an important role in

establishing the link of Coronavirus with chest X-ray images using AI model along with teams from other CSIR laboratories. Addressing the participants, he said that today's artificial intelligence has developed a lot as compared to its early stages but still has a long way to go.

While conducting the webinar, Boot Camp's Mentor of Change, Mr Pramod Kumar Tanwar, Principal Scientist gave a formal introduction to Dr Anurag Agarwal. Putting forward the agenda of the programme, he said that the programme aims to attract the adolescent manpower of the country towards scientific innovation and motivate and encourage entrepreneurship.

Dr Abhijit Karmakar, Chief Scientist and Head, Skill Development Programme & Technology Business Development, appraising the background of the BootCamp, informed that Boot Camp under Jigyasa Vigyan Mahotsav 2022 is being organised as a part of Azadi Ka Amrit Mahotsav. Dr Karmakar said that CSIR is organising a series of webinars and competitions for the students through this programme. By this, the young talent of the country is not only being provided with the opportunity to interact with the best scientists and industry experts, but also they are getting a great opportunity



Dr Abhijit Karmakar informing about Jigyasa Vigyan Mahotsav 2022

to learn and understand the latest technologies. He said that the registered students participating in the BootCamps would also be given participation certificates. After the lecture, Dr Abhijit Karmakar expressed his gratitude to Dr Anurag Agarwal for the invited lecture.

The Webinar was attended by school students, project staff, research scholars and other colleagues.

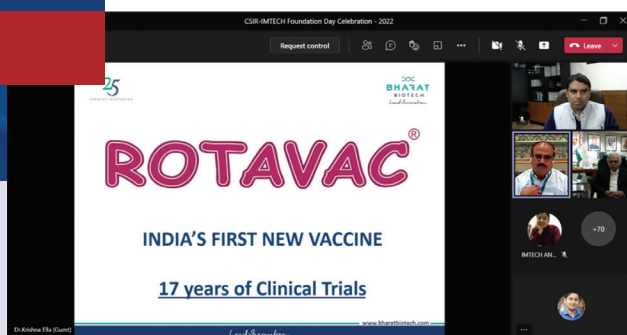
A scientific Quiz session was also organised towards the end of the session. The quiz was based on topics related to AI, health and general science. Dr Gaurav Purohit, Senior Scientist, interactively conducted the live quiz session. The webinar was live-streamed on the official CSIR Jigyasa YouTube channel as well.

Dr Pramod Kumar said that the programme aims to attract the adolescent manpower of the country towards scientific innovation and motivate and encourage entrepreneurship.

CSIR-IMTECH Celebrates its 38th Foundation Day

CSIR-Institute of Microbial Technology (IMTECH), Chandigarh, celebrated its 38th Foundation Day on 24 January 2022 by organising several events including the much-anticipated Foundation Day Lecture. Dr Krishna Ella, Chairman & Managing Director of Bharat Biotech International Limited delivered this year's Foundation Day Lecture virtually on 'Innovation and Leadership in Pandemic'.

Dr Ella in his Foundation Day lecture highlighted how today's neglected infectious diseases could be tomorrow's global pandemic and stressed the need to have a coherent strategy to fight infectious diseases. Bharat Biotech's COVAXIN is credited to be India's first indigenous COVID-19 vaccine to be approved and administered in a sizeable population across the globe. Under Dr Ella's leadership, Bharat



Dr Krishna Ella delivering the Foundation Day Lecture on "Innovation and Leadership in Pandemic"

Dr Ella highlighted how innovative technology in vaccine development is essential to solve public healthcare problems caused by infectious diseases.

Biotech has grown to become a global leader in an innovative vaccine.

During his lecture, Dr Ella highlighted how innovative technology in vaccine development is essential to solve public healthcare problems caused by infectious diseases. He said that Indian pharmaceutical companies need to innovate beyond generic vaccines to be a global player in the vaccine market. He stressed the need for scientists to examine the unknowns that could be the future cause of pandemics through zoonotic and unknown viruses. A serial entrepreneur with a passion for innovative ideas, Bharat Biotech has also ventured into veterinary vaccines, food processing, and developing biotechnology infrastructure in the country. Dr Ella is also involved in shaping India's science education and policy through his association with several committees.

Dr Shekhar C. Mande, Secretary DSIR & Director General CSIR, who

was the Guest of Honor for this event extended his best wishes to IMTECH on its 38th Foundation Day and asked scientists to focus on microbiome therapies which could be a future game-changer for treating diseases. He expressed his views on innovation-related research from an Indian Industry perspective and also announced awards for Dr VC Vora Best PhD Thesis and PhD Research Presentation Awards for the years 2020 and 2021.

Dr Sanjeev Khosla, Director, CSIR-IMTECH while welcoming the guests and faculty to IMTECH's foundation day gave a brief background of CSIR-IMTECH and apprised the audience with the institute's achievements during the last year. He also lauded the efforts of scientists and researchers for the work carried out to fight the pandemic during the challenging times of COVID-19.

Speaking at the occasion, Dr Khosla said, "IMTECH has been at the forefront of mitigating challenges posed due to the COVID-19 pandemic. Right from genome sequencing of clinical samples to developing COVID-19 Subunit Protein-based Vaccine POC; from testing products for anti-viral efficacy to developing UV-C Disinfection Systems for Indoor spaces; we have held on to the philosophy that interdisciplinary and collaborative efforts are key to address situations like the current pandemic."

MoUs/Agreements

CSIR-CDRI and AvetaBiomics Join Hands for the Development and Commercialisation of First-in-Class Bone Health Drugs

CSIR-Central Drug Research Institute (CDRI), Lucknow, one of the premier drug research institutions

and AvetaBiomics, USA, a leader in developing the next generation of botanical drugs based on its evolutionary



biology platform joined hands and announced on 31 January 2022 exclusive licensing to AvetaBiomics of CDRI's patented technology of Caviunin-based drug compositions for further clinical development and commercialisation.

Worldwide, one in three women and one in five men over the age of 50 years suffer an osteoporotic fracture. In the US alone, an estimated 10 million people over the age of 50 years have osteoporosis and one in two women in the United States will sustain a fragility fracture in her lifetime. Over 43 million more people in the US have low bone mass, putting them at increased risk for osteoporosis. Globally, in 2019, there were 178 million new fractures and 455 million prevalent cases of consequences associated with a fracture. According to the Indian Society for Bone and Mineral Research (ISBMR), India, 50 million Indian women suffer from osteoporosis.

"Osteoporosis is a chronic condition requiring life-long treatment. Approved treatment duration of currently available drugs ranges from 1 to 5 years (depending on the drug) due to waning efficacy and increased risk of adverse events. Caviunin-based therapeutic has a huge potential to change the standard of care for

osteoporosis. The potential benefit-risk profile is expected to be second to none with desirable efficacy and safety for long-term use," said Dr Parag G. Mehta, CEO of AvetaBiomics, USA. "We are excited to bring these new drugs to the patients and pleased that we can benefit from the deep scientific know-how of the CDRI team."

Dr Ritu Trivedi's group from the Endocrinology Division (CDRI) has shown that the Caviunin scaffold has a targeted action that prevents bone breakdown, stimulates new bone formation and reduces bone turnover markers.

This decade-long research at CDRI provides an insight into developing the first-in-class drug that is likely to modulate the host microbiome. "This license is a testament to the calibre of our innovative science and demonstrates the value of strong research productivity of our world-class scientists. We joined hands with AvetaBiomics given their track record of obtaining four clinical INDs of their botanical drugs for several cancer indications from the US FDA. We expect, therefore, translation of CDRI's research into real drugs for people living with bone-related conditions," said Prof. Tapas Kumar Kundu, Director of CDRI.

This decade-long research at CDRI provides an insight into developing the first-in-class drug that is likely to modulate the host microbiome.

- Caviunin scaffold containing drug is the first orally administered drug with both anti-catabolic (prevention of bone breakdown) and anabolic (new bone formation) properties and is ready for Phase 2 clinical trials.
- The drug has broad applications for bone health-osteoporosis, fracture healing, osteoarthritis and other endocrinological conditions.

REFERENCES

International Osteoporosis Foundation

National Osteoporosis Foundation. Osteoporosis Fast Facts. <https://cdn.nof.org/wp-content/uploads/2015/12/Osteoporosis-Fast-Facts.pdf>

Centre for Disease Control and Prevention, NCHS Data Brief No. 405, March 2021 GBD 2019 Fracture Collaborators. Global, regional, and national burden of bone fractures in 204 countries and territories, 1990-2019: a systematic analysis from the Global Burden of Disease Study 2019. *Lancet Healthy Longev.* 2021 Sep;2(9):e580-e592.

Archives of Osteoporosis (2021) 16:102. Cell Death Dis. 2014 Sep 18;5(9):e1422

CSIR-CDRI Licenses Technology of Nucleic Acid Staining Dye GreenR™ to GenetoProtein Pvt. Ltd for Life Sciences Research

Dr Tapas Kumar Kundu said "The nucleic acid staining dye segment seems to be dominated by costly imported products of multinational companies and this make-in-India product is cost-effective and it will reduce our dependency on foreign supplies".



CSIR-CDRI, Lucknow, licensed Technology of Nucleic Acid Staining Dye GreenR™ to GenetoProtein Pvt. Ltd for life sciences research with trade name "GreenR™". GenetoProtein Pvt. Ltd. (GTP), a start-up company registered in Uttar Pradesh in the year 2020 is involved in developing an array of enzymes, kits and biochemical used in Lifesciences research, particularly in molecular biology. The dye GreenR™ has been developed by CDRI Senior Principal Scientist Dr Atul Goel in a joint collaborative project with an industry partner Biotech Desk Pvt. Ltd, Hyderabad.

The director CSIR-CDRI Dr Tapas Kumar Kundu said, "The nucleic acid staining dye segment seems to be dominated by costly imported products of multinational companies and this make-in-India product is cost-effective and it will reduce our dependency on foreign supplies. He further mentioned that CSIR-CDRI is committed to nurture the development of pharma cluster and start-up culture in Uttar Pradesh and this is another step in this direction."

While talking about the technology, Dr Atul Goel informed that the product GreenR™ may be used to stain DNA and RNA for research and diagnostics to detect and quantify them. It binds to nucleic acids like genomic DNA, PCR products, plasmids and RNA under blue light or UV exposure.

Dr Shradha Goenka, Director of GenetoProtein Pvt. Ltd commented that the efficacy and toxicity of GreenR™ have been tested and various applications for this dye are now being studied. We have been dependent upon stains like Ethidium bromide which intercalates between the DNA strands and is a known mutagen to bacteria, animals and humans. Hence its usage is risky for the user and its disposal needs special treatment as well. To overcome these issues of toxicity, some foreign companies have invented safe DNA dyes such as Sybr Safe™ by

ThermoFisher. However, these dyes have substantial costs as they are expensive to import.

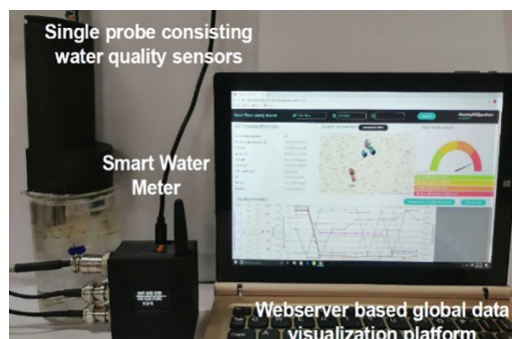
The development of a new safe dye which the team has named “GreenR™” will help researchers in the field of Lifesciences and DNA-based diagnostics to bring down their cost substantially. This would enhance the product portfolio of the company and help Indian research go one step closer to Aatmanirbhar Bharat. The product also has applications in molecular diagnostics and would help in PCR based testing of diseases.

Transfer of Handheld Smart Water Diagnostic System for Water Quality and Discharge Monitoring

Water quality in rural areas is difficult to monitor due to a lack of connectivity from different water laboratories. In other areas, location-based real-time water quality data collection is a tedious job and is highly dependent on human intervention.

CSIR-CEERI, Pilani, has developed a handheld smart diagnostic system for remote monitoring of water quality parameters along with the flow rate and water volume consumption. The system measures various water quality parameters such as pH, TDS, salinity, conductivity, ORP, turbidity and temperature along with flow rate and water volume consumption. The system is also capable of transferring data from the device to the cloud using on-board GPRS services for remote monitoring and analysis purpose. It consumes very less power (400-600 MW) for sensing, data acquisition, operation and communication.

It runs with 3.7 volts/1000 mAh rechargeable battery for more than 15 days. The system has an on-host small



Technology for water quality and discharge monitoring



Device installed at a Water Purification Plant

solar panel for continuous charging of the battery. Further, it also has a provision to charge using a regular USB DC mobile charger. A web-based dashboard has also been developed to monitor real-time data from the deployed nodes.

The system has been tested rigorously and validated against standard buffer samples and also with existing third-party systems. It has also gone through an internal TRL evaluation process and the empowered committee assigned TRL-5 for the developed technology. The developed system has been installed at nearby villages of Rajasthan for detailed testing and performance evaluation.

The complete developed technology was transferred to M/s WaterQuest Hydroresources, Ahmedabad (<https://waterquestresources.com>) in the year 2021 for mass production and commercialisation.

The company has successfully fabricated, tested and sold more than 100 pieces in the last three months globally.

Table-1: Overall System Technical Specifications

Parameter	pH, TDS, temperature, turbidity, ORP, conductivity, salinity, flow rate, water volume consumption
Range	pH (0-14), TDS (0-10000 ppm), Turbidity (0-1000 FNU), Flow rate (30-3600 LPH), ORP (-355 to +355 mV)
Resolution	pH (0.1), TDS(1ppm), Turbidity (1 FNU), Temperature (0.1 0C), Flow rate (0.5 LPM)
Other Technical Specs	Power Consumption: 600 mW (Measurement Mode) and 900 mW (Data Transfer Mode) Sampling Rate: 9.60 kHz Data Storage Capacity: 1 Megabyte EEPROM Data Transmission Rate: 1 Sample per second (Configurable)
Environment	System has been tested and installed in Lab conditions (T= 10-55 0C and flow rate = 0 to 220 LPH) and also on field conditions (T= 35-40 0C and flow rate = 0 to 1200 LPH)
Physical Parameters	Developed system is handheld and has following specifications. Weight(System) -108 grams Weight (Probe) -183 grams Dimension(System)-60x50x30 mm Dimension(Probe)-125x50x40 mm
Other Features	- Connectivity to the webserver based global data visualization platform using GSM/GPRS facility - Compact size and user-friendly in operation - Local graphical display for water quality parameters, flow rate and water volume consumption - Single key-based user-friendly calibration feature - Text message-based notifications and alerts - Local memory for data storage in network unavailability situations - Data is saved with date time stamp

Conferences/Workshops/Seminars

“Science Teaching Methodologies in the 21st Century – A Students’ Perspective” Webinar Organised by CSIR-NIScPR

An instructive national webinar for students was organised by CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), New Delhi, on the topic “Science Teaching Methodologies in the 21st Century – A Students’ Perspective” on 15 February 2022 in an endeavour to

engage students from different corners of India to present their opinions and perspectives on 21st century teaching methodologies.

Prof. Ashok K. Bakshi, a renowned academician and Former Vice-Chancellor of PDM University, Bahadurgarh, Haryana, was the resource person and presented his expert views. Prof. Bakshi is presently chairman of the National Resource Centre of Chemistry of the MHRD and was earlier also Vice-Chancellor of UP Rajarshi Tandon Open University, Allahabad. Prof. Bakshi also has the distinction of being one of the first persons from the Universities in India to have been selected as the Member Scientist of the “Third Indian Research Expedition to Antarctica” in 1984.

Mr R.S. Jayasomu, Chief Scientist, CSIR-NIScPR during his inaugural address briefed about the activities of the newly founded institute CSIR-NIScPR which revolves around science communication and policy research. Appreciating the theme of the webinar he said that it's a very good initiative to involve young minds to discuss various aspects of teaching methodologies.

Students during their presentations mentioned the various aspects of science teaching methodologies in the 21st century and also talked about the importance of online teaching along with its pros and cons. They highlighted how today's shift due to the COVID-19 pandemic from traditional teaching methods to virtual classrooms had helped them to build up learning concepts with demonstration-based learning.

Students also gave their views about the ways science is being taught at present. Appreciating the efforts of teachers, the students discussed the need for transformation in the science teaching system so that they can have



meaningful learning using different technology tools.

Sharing his experiences, Prof. A.K. Bakhshi said that India needs to do a lot to improve science teaching. He added that as we are living in the 21st century the curriculum and teaching methods for students should also be of the 21st century and accordingly the assessment should also be in tune with the times. He said that to excel in the 21st century, there is a need to have outstanding, interdisciplinary and practical knowledge along with 21st century skills. He mentioned three main challenges of the information age including uncertainty, artificial intelligence and massification of education. To overcome these challenges 21st century skills are needed which come under three categories — learning skills, literacy skills (information, media and technology literacy) and life skills. Since there are no machines with these skills, they need to be nurtured in students, Prof. Bakhshi added.

Citing a report he said that 87% of people fail in life not because of capability but because of personality. Besides knowledge and skills, one should also have the right personality which decides the values, attitude, traits and behaviour. Competence is decided by knowledge, skills and personality, he added.

Discussing the challenges in science he emphasised that we need creative minds in India. Again citing a report, he mentioned that nearly 98% of the kids who enter Kindergarten think differently but once they go through the education

Prof. A.K. Bakhshi said that as we are living in the 21st century the curriculum and teaching methods for students should also be of the 21st century and accordingly the assessment should also be in tune with the times.

Dr Shekhar C. Mande expressed his trust on the commitment of the Institute staff in contribution towards the Healthcare and Pharmaceutical Industry.

system, they think alike which shows that our teaching methodology curbs their thinking ability.

Prof. Bakhshi felt that there is a crisis of creativity in the Indian education system and more so in science. Explaining the purpose of education he said that we need to encourage out-of-the-box thinking in students in lower classes and teaching methods should focus on encouraging the students which will ultimately give rise to learning.

He emphasised that the traditional talk & chalk method of teaching does not align with our present 21st century methods, for which teachers need to change teaching methods. Teachers

should encourage problem-based learning involving students.

Concluding, he said that there is a need to have a problem-based interdisciplinary approach in the teaching methodology to encourage students to construct knowledge on their own. Once this is done at lower classes, by the time students come into higher education they will become experts.

Earlier, Dr Meher Wan, Scientist, CSIR-NIScPR, explained the concept of the webinar. The Webinar was very interactive wherein students came up with several queries and got them clarified. Finally, Ms Sonali Nagar, Scientist, CSIR-NIScPR, proposed the vote of thanks.

Events

CDRI's 71st Annual Day Celebrations

"Trust, Transparency, Timeline & Mutual Respect are the key to success for the development of Covaxin in record time through Public-Private Partnership": Prof. Balram Bhargava

CSIR-Central Drug Research Institute (CSIR-CDRI), Lucknow, celebrated its 71st Annual Day on 17 February 2022. On this occasion, the prestigious 47th Sir Edward Mellanby Memorial Oration was delivered by Prof. Balram Bhargava, Secretary, Department of Health Research (Ministry of Health & Family Welfare) & Director General, ICMR (Indian Council of Medical Research).

The topic of his talk was "Going Viral: Making of Covaxin, the inside story". He said that Trust, Transparency, Timeline & Mutual Respect are the key to success for the development of Covaxin in record time through Public-Private Partnership. He further mentioned that to combat the COVID-19 pandemic, the Indian Government followed Buddha's Middle Path for managing the lockdown. With Covaxin, we proved

that we could manufacture vaccines from start to finish. This story is an inspiring example for the scientific world.

Dr Shekhar C. Mande, Secretary, DSIR & Director General, CSIR, greeted the team CSIR-CDRI and expressed his trust on the commitment of the Institute staff in contribution towards the Healthcare and Pharmaceutical Industry.

Dr Tapas Kumar Kundu, Director, CSIR-CDRI, welcomed all the dignitaries and briefed the achievements of the Institute in the past year. During the year, the Institute has licensed Dalbergia sissoo — US patent (US 10,292,994, B2) to AVETA Biomix Inc. USA for further development as a botanical drug for the treatment of Osteo-health-related disorders as per USFDA regulations.

Further, two of the promising investigational new drugs S007-867 (antithrombotic) and S007-1500 (fracture healing drug candidate) have been licensed to Industry partners for further collaborative development. Phase I clinical trial for both the

INDs shall be initiated shortly. The institute also has a rich pipeline of new leads and candidate drugs for different disease areas of national importance including malaria, leishmaniasis, cancer, neuropathic pain, stroke, BPH, etc.



Technology transfer of a potential rapid fracture-healing drug candidate (S007-1500) to Troikaa Pharmaceutical Pvt. Ltd

Director, Dr Tapas Kumar Kundu announced a collaboration in the form of a license agreement between CSIR-CDRI, Lucknow and Troikaa Pharmaceutical Pvt. Ltd, Ahmedabad to develop, manufacture and commercialise CSIR-CDRI's S007-1500 as a potential rapid fracture-healing agent. The collaboration aims to leverage CSIR-CDRI's drug discovery expertise and Troikaa's broad expertise in clinical development, manufacturing and commercialisation to speed up the drug development programme.

Team Leader Dr Atul Goel and Dr Divya Singh informed, currently there is no oral treatment available for fractured bone healing. CSIR-CDRI has developed a novel small molecule S007-1500 (a new chemical entity) as a rapid fracture-healing agent. The efficacy and safety of S007-1500 have been established by CSIR-CDRI in various animal models. CSIR-CDRI has received approval to conduct Phase-I clinical trial from CDSCO, India.



Troikaa wishes to unleash its expertise in clinical development for further evaluation of safety and efficacy of S007-1500 in humans and giving patients much needed treatment options for rapid healing of bone fractures, said Dr Asheel Patel Executive Director, Troikaa, Pharmaceutical Pvt. Ltd Ahmedabad.

Annual Report 2021-2022 was also released by dignitaries and the programme was concluded with vote of thanks by Dr Ajay K. Srivastava, Chairman organising committee.

Troikaa wishes to unleash its expertise in clinical development for further evaluation of safety and efficacy of S007-1500 in humans and giving patients much needed treatment options for rapid healing of bone fractures, said Dr Asheel Patel.

Announcement of CDRI Awards-2022 for Excellence in Drug Research

The prestigious CDRI Awards-2022 for Excellence in Drug Research was also announced. These awards will be conferred on CSIR's Foundation Day in September this year. For the prestigious CDRI Awards 2022 for Excellence in Drug Research in Chemical Sciences category, Dr Alakesh Bisai, Professor, Department of Chemistry, IISER Kolkata and Dr S.S.V. Ramasastry,

Associate Professor, IISER Mohali have been selected.

In the Life Sciences category, Dr Maddika Subba Reddy, Staff Scientist-V, Centre for DNA Fingerprinting and Diagnostics, Hyderabad and Dr Amit Awasthi, Associate Professor, THSTI, Faridabad, have been selected for the CDRI Awards 2022.

Annual Awards-2021 for the Best Technology, Patents & Publications

The Best Technology Award-2021 was conferred jointly to the technology "Fluorescent Dye (CDRI-KD1) and Quenchers (CDRI-KQ3, CDRI-KQ4) for the development of Indigenous qRT-PCR testing kit" (Transferred to Biotech Desk Pvt. Ltd, Hyderabad) and to the developer of "A novel small molecule antiplatelet compound S007-867" (Technology transferred to MARC Laboratories Pvt, Ltd., Lucknow).

- **Dr Mridula Kamboj Award-2021 for Technology** was conferred to

the technology for "Development of Umifenovir as possible Treatment of COVID-19".

- **The Best Patent Award-2021** was conferred to the patent granted in Australia to "A Formulation Useful for Delivery of Neuro Protecting Agent".
- **The Best Publication Award-2021:** Eleven Research papers, with more than seven impact factors were awarded the Annual incentive award.

Academic Career Achievement Awards-2022 for Research Scholars

Distinguished Career Achievement Awards-2022

- Dr MM Dhar Memorial Distinguished Career Achievement Award- 2022 in Chemical Sciences: Mr Anuj Kumar
- Dr MM Dhar Memorial Distinguished Career Achievement Award- 2022 in Biological Sciences: Mr Mushtaq Nengroo
- Dr JM Khanna Memorial Distinguished Career Achievement Award- 2022 in Pre-clinical & Clinical Sciences: Mr Syed Anees Ahmed

Early Career Achievement Awards-2022

- Dr JM Khanna Memorial Early Career Achievement Award 2022 (Jointly)
 - Mr Ashfaq Ahmad
 - Mr Krishna Bhan Singh
- Dr Swarn Nitya Anand Memorial Early Career Achievement Award 2022 for Women Research Scholars: Ms Deblina Roy
- Dr DL Srivastava Memorial Early Career Achievement Award 2022: Mr Mayur Diliprao Ambule

Prof. Ambuj Sagar highlighted the current plans of energy transitions in India towards the national goal of reducing the carbon intensity of our economy by 45% over 2005 levels by 2030 and achieving net-zero emissions by 2070.

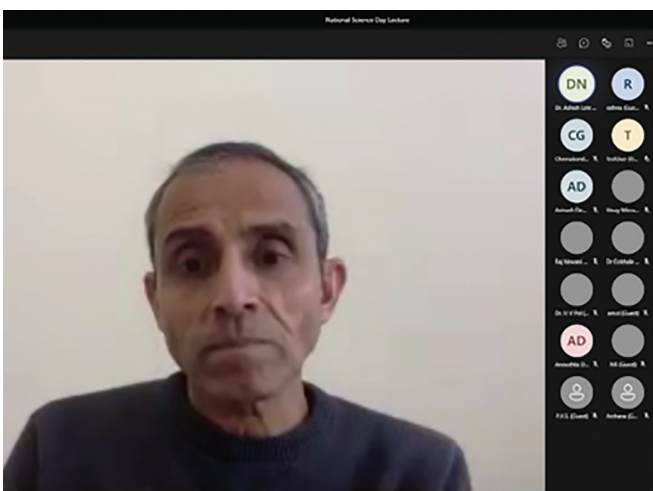
CSIR-NCL Celebrates National Science Day

CSIR-National Chemical Laboratory (CSIR-NCL), Pune, celebrated the National Science Day on 28 February 2022 through two events, a lecture for CSIR-NCL staff members, and a lecture for school students.

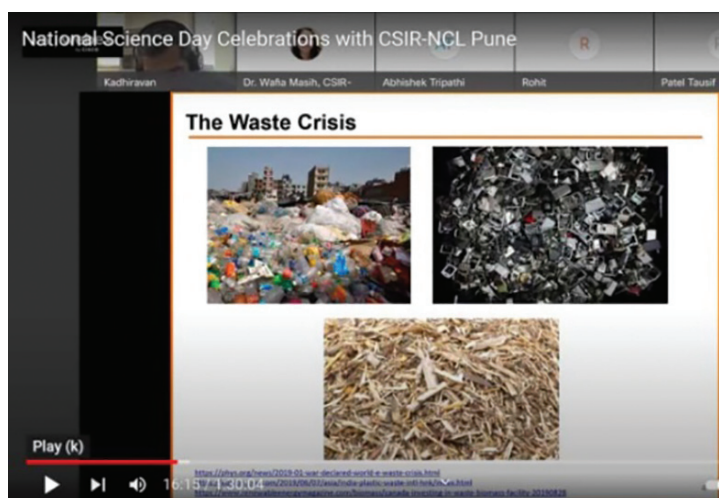
Prof. Ambuj D. Sagar, Vipula and Mahesh Chaturvedi Professor of Policy Studies & Head, School of Public Policy, Indian Institute of Technology Delhi, virtually delivered the National

Science Day lecture on "The clean-energy transition: Challenges and opportunities."

During his lecture, Prof. Ambuj Sagar highlighted the current plans of energy transitions in India towards the national goal of reducing the carbon intensity of our economy by 45% over 2005 levels by 2030 and achieving net-zero emissions by 2070. Prof. Sagar presented data on the



Prof. Ambuj D. Sagar



Converting waste to value

Indian emissions and electricity usage per capita, which are among the lowest among countries with comparable GDP. To achieve the national climate action targets while maintaining our rate of growth, he emphasised that it cannot be ‘business as usual’, and we have to identify and deploy suitable technologies that are not only fast, economically sustainable, and scalable, but also in tune with our institutional and human resource capabilities.

He observed that while the technologies needed to achieve the 2030 goals are available today, the technologies on whose success the 2070 goals are based are not yet established. As such, substantial research and development efforts in this area are required. Prof. Ambuj presented data showing the low level of R&D investment in India, which is about half the global average, and less than a third of the average for developed countries. He pointed out the lack of publicly available detailed data on specific R&D in the energy sector.

He discussed in brief various options and sectors in which countries are investing in energy R&D, including hydrogen/fuel cells, solar energy, nuclear energy and cleaner

technologies for existing fuels. He concluded by emphasising that the enormous challenge to be addressed in a short time presents a great opportunity to build a clean energy industry in India, requiring an innovation ecosystem comprising higher education and research institutes, private R&D organisations, and knowledge partnerships among them.

In the second event, virtually attended by students from city schools, Dr Kadhiravan Shanmuganathan, Senior Scientist, CSIR-NCL gave a talk on “Converting Waste to Value: Need of Any Society”. Dr Kadhiravan explained the waste management problems being faced across the globe and the idea of “waste to value”. He told the students about the different types of waste and how they can be effectively and economically processed or reused using scientific and engineering principles. He concluded the talk by explaining the research work on advanced materials and applications done in his lab, including the elastic piezoelectric aerogels made using cellulose nanofibres.

As part of this outreach programme, a live demonstration was organised giving instructions on how to construct a simple water-conservation system.

Dr Kadhiravan explained the waste management problems being faced across the globe and the idea of “waste to value”.

CCMB Celebrates Founder's Day on Dr PM Bhargava's Birth Anniversary

Prof. K. VijayRaghavan underlined the importance of restructuring science research institutes in the country. He urged greater collaborations across scientists interacting across disciplines, including with the industry.

CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad, celebrated Founder's Day on the occasion of the birth anniversary of their Founder Director, Dr PM Bhargava on 22 February 2022. "Dr PM Bhargava set the foundation for setting up a world-class research institute in life sciences in India.

"The institute's vision was and has been to address fundamental questions of biology and address societal challenges through it," said Dr Vinay K Nandicoori, Director, CCMB. "Now after more than 40 years of CCMB and training more than 400 PhD students, we see our students playing an important role in multiple areas of life sciences. The celebrations on our Founder's Day is a reminder of that."

The celebration, each year, is organised by CCMB students to bring the alumni back on campus and learn from their experiences. The alumni speakers this year were Dr Rana Anjum, Director-Oncology Clinical Science, GSK in Boston, USA, and Dr Suresh Chintalapati, Co-founder, Triangulum Biopharma, California, USA and Mabgenex, Hyderabad, India. Both spoke of their career journeys on transitioning from academia to the life science industry. Dr Anjum also highlighted the challenges she had to overcome as a woman scientist in the family who wanted to work beyond her city and country. Dr Chintalapati spoke

of his navigation through academia while dealing with dyslexia.

"The opportunities after completing a PhD are limitless, ranging from various positions in academia to industry and even science communication. CCMB has built a rich heritage, and CCMB graduates have penetrated in all areas of science. Inviting these CCMB alumni provides an avenue for the current graduates to connect with them and get a perspective on the opportunities that lie ahead after completing a PhD," said the student organisers.

Prof. K. VijayRaghavan, Principal Scientific Advisor, Government of India was the guest speaker for the event. He underlined the importance of restructuring science research institutes in the country. He urged greater collaborations across scientists interacting across disciplines, including with the industry. He emphasised that it is important for society to nurture young scientists to address questions of their interests while forging collaborations. This is imperative for addressing the questions of the future, he said.

In addition, the day had many short exciting talks by students on unaddressed questions to understand life. The day ended with a Carnatic vocal performance by Shri Modumudi Sudhakar accompanied by Shri Dinakar on violin and Shri Jayabhaaskar on mridangam.

Printed and Published by

Hasan Jawaid Khan on behalf of CSIR-National Institute of Science Communication and Policy Research

Dr K.S. Krishnan Marg, New Delhi -110 012 and printed at NIScPR Press

Dr K.S. Krishnan Marg, New Delhi -110 012

Editor: Hasan Jawaid Khan; Assistant Editor: Sonali Nagar

Design: Neeru Vijan, Abhinav Raj; Production: Ashwani Kumar Brahmi

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

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

Please direct all Subscription-related queries to:

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

Annual Subscription: ₹500; Single Copy: ₹50.00

RN 4512/57