

चिद्युतान तान्त्राद्युतान अनुवादन

DEPARTMENT OF SCIENCE AND TECHNOLOGY
NITTE UNIVERSITY TECHNOLOGY ENABLING CENTRE



DST NU-TEC Chronicle | October 2020 to January 2021

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“Though innovations have been driving technological developments, it is being increasingly realized that innovation is most often the product of collaborative process rather than the result of intelligence of a single individual.”

Prof. Dr Iddya Karunasagar
Advisor-Research & Patents

Dear Readers,

The second issue of DST NU-TEC Chronicle provides a glimpse to our efforts to bring together different academic disciplines as well as academy and industry. The need to be open to good ideas from everywhere was recognized even during the Vedic times and Rig Veda summarized this in the statement “Aano bhadra kratavo yantu vishwatah” or “Let noble thoughts come from all directions”. Though innovations have been driving technological developments, it is being increasingly realized that innovation is most often the product of collaborative process rather than the result of intelligence of a single individual. DST NU-TEC has been reaching out to new institutions at national and international levels and contributing collaborative activities through joint projects. In addition to activities listed in this Chronicle, there have been number of multi-disciplinary discussions with academic and industry partners. Some of these have led to development of translational project proposals submitted to funding institutions. We do recognize that due to the Covid pandemic, resources for research are very limited and the grants are highly competitive. Therefore our focus has been to attempt at high quality proposals and this involves extensive multidisciplinary discussions. That we need to aim high and not be disappointed at failures has been well stated in the Bhagavad Gita: “We are kept from our goal not by obstacles, but by a clear path to a lesser goal. Don’t settle for less, strive hard for bigger goals”. We keep working in DST-NU-TEC in this spirit of achieving bigger goals and reminding ourselves what Louis Pasteur, the father of Microbiology said “These three things –work, will, success – fill human existences. Will opens the door to success, both brilliant and happy. Work passes these doors and at the end of the journey, success comes in to crown one’s efforts”.

The four C's sought after in the 21st century are: critical thinking, creativity, collaboration and communication.

Prof. Dr Indrani Karunasagar
Director DST NU-TEC



Dear Readers,

“Ring out old bells, ring in the new”. The worst of the pandemic is over and India withstood the onslaught with determination to win over the viral enemy. The new year is born and with it, aspirations and hopes that this year will be kind, with vaccination for all to prevent any further catastrophe through spread of the SARS CoV2 virus.

To all our friends and associates of DST NU TEC, let me reiterate how much we value your association and see the need to stay connected, to enable sharing the latest in the field of research and technology transfer. Our electronic newsletter is not only a way for the country and our University policy to stay green but also to disseminate in a more timely manner updated news, information, and inspirational stories, in addition to informing all of you on the various announcements for projects with funding opportunities that will be put out through the website. The NU-TEC team takes pride for the timely release of the second issue of the chronicle ‘Vigyaan Tantragyaan Anuvaadan’ and providing a curtain raiser of what the centre has accomplished in recent months! Our projects are fully under way and we have successfully established partnerships at multiple levels. Featured in this issue of the newsletter are the meetings that brought together researchers, and Institution leaders to engage in very challenging conversations, assess the current body of research, and determine knowledge and capability gaps in innovation.

The four C's sought after in the 21st century are: critical thinking, creativity, collaboration and communication. Critical thinking to encourage objective evaluation of an issue with abilities of problem solving, creativity to think 'out of the box' to provide unique solutions, collaboration to teach us how to work together to achieve a common goal and finally an effective communication that helps to convey the ideas effectively. All of this is to be mined and nurtured collectively, for serving the very purpose for which the TEC was awarded by the DST to Nitte (DU).

We have launched several programs for researchers and students especially in patent knowledge dissemination and help with identifying technologies that could possibly be taken up by start-ups. If you are interested in partnering with us on future research projects, find out more about our various programs and activities. These are exciting times that offer new opportunities for collaboration, networking and support through the innovation and incubation centres. Creativity is one of the greatest characteristics that human beings possess and this can be expressed in different ways. It is often perceived that precision of a scientist, passion of a poet or imagination of an artist are totally different and far from each other, but now we know that all of these are intimately related into different forms of expression of a creative mind. A scientist cannot be successful in the discoveries and the novel ideas without a passion, precision and creative imagination. If you are a student and interested in working with our researchers at the Technology Enabling Centre, consider contacting us for developing your ideas.

“For the birth of something new, there has to be a happening. Newton saw an apple fall; James Watt watched a kettle boil; Roentgen fogged some photographic plates. And these people knew enough to translate ordinary happenings into something new” said Alexander Fleming, the discoverer of Penicillin. DST created TEC at Nitte (DU) to enable your innovative idea and help translate.

TEC ADVISORS

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Vice-Chancellor

Dr M.S. Moodithaya

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Registrar

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BOOK RELEASE- 'Birds of the Campus'

14 December 2020



National Energy Conservation Day was jointly organized by Nitte University Green Initiative Project (NUGIP), National Service Scheme (NSS) and DST Nitte University-Technology Enabling Centre (DST NU-TEC) at Nitte (Deemed to be University) campus, New Auditorium, ABSMIDS building on 14th December, 2020. On this occasion NUGIP and DST NU-TEC released the book **"Birds of the Campus."** Prof. Smitha Hegde, NUCSER, editor, outlined the highlights of the book to the audience. A collection of 93 spectacular pictures of the birds along with QR codes lead the reader to intricate details on their distribution, food habits, and calls that are explicitly presented. The authors of the book Dr Jagdish Gopal Paithankar, Dr Vineeth Kumar K. and Ms Gincy Joseph were felicitated for their contribution. Dr A Venkata Ramana, Chairman, New Mangalore Port Trust, Panamburu was the chief guest. He elucidated the significance of the day and the urgent need for energy conservation in a rapidly developing country like ours. Sri Santhosh Kumar Rai Boliyar, the guest of honor, delivered an insightful and highly relevant message of social concern on energy and power. The Vice Chancellor of Nitte (DU) Prof. Dr Satheesh Kumar Bhandary, president of the function, enlightened the audience on the urgent need of discovering alternative sources of energy. He expressed his concern on the environmental degradation leading to global warming and advised on preserving nature. Prof. Dr Alka Kulkarni, Registrar of the University, welcomed the gathering by reminding everyone on the importance of the day and the need to harness renewable energy. Prof. Dr Sumalatha Shetty introduced the guests to the audience and Mr Shashikumar Shetty proposed the vote of thanks.

Authors information



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Ms Gincy Joseph

Editor



Prof. Dr Smitha Hegde



"To me birds represent the technical perfection of a biological system, the ultimate miracle of flight created in bones, blood wrapped as stunning packages of feathers"

Prof. Dr Smitha Hegde

CHRONICLE RELEASE

22 December 2020



The virtual release of the first issue of DST NU-TEC Chronicle '*Vigyaan Tantragyaan Anuvaadan*' via videoconferencing system was held on December 22, 2020 at the DST NU-TEC facility at paneer campus. The chronicle was released by Hon'ble Vice Chancellor Prof. Dr Satheesh Kumar Bhandary. Prof. Dr M S Moodithaya, Pro-Vice-Chancellor and Prof. Dr Alka Kulkarni graced the occasion. Prof. Dr Smitha Hegde Coordinator DST NU-TEC welcomed the guests and the audience to the virtual release. Prof. Dr Indrani Karunasagar Director DST NU-TEC spoke on various missions set by DST NU-TEC to reach the objectives and thereby, meet the socio-economic needs of the country. The curtain raiser of DST NU-TEC Chronicle '*Vigyaan Tantragyaan Anuvaadan*' was done by Prof. Dr Iddya Karunasagar Advisor (Research and patents). A glimpse of activities of TEC held during the period of June to September was displayed to the audience through the Chronicle. Prof. Dr Satheesh Kumar Bhandary appreciated the efforts of team DST NU-TEC towards bringing about collaborations to bridge the gap between bench work research and industrial needs. Prof. Dr M S Moodithaya highlighted that one of the key factors for success is technology in any field and how having a technology enabling center can help catch up with times. Prof. Dr Alka Kulkarni congratulated the team on the release and outlined how this project came into existence in Nitte (DU) and how University aims at translation of technology via incubation centers and TEC. The virtual release was moderated by Ms Akshatha, Junior Project Associate and was concluded with a vote of thanks proposed by Dr Krishna Kumar, Co-coordinator, DST NU-TEC.



DST NU-TEC signs MoU with Canara Engineering College

Wed, 13 Jan 2020



The agreement aims to foster collaboration between engineers and biologists and benefit the rural folk by capturing the essence of rural technology and home industries to help them move up the value chain

NU-TEC the only Technology Enabling Centre in Karnataka, has taken initial steps in collaborating with the industries and academia. In this regard, MoU exchange between Canara Engineering College, and DST NU-TEC, Nitte (DU) was organised on January 13, 2021. The MoU was signed by Prof. Dr Ganesh V Bhat Principal, Canara Engineering College and Prof. Dr Alka Kulkarni, Registrar, Nitte (DU) in the august presence of Prof. Dr Satheesh Kumar Bhandary, Hon'ble Vice-Chancellor, Nitte (DU), Prof. Dr M.S. Moodithaya, Pro-Vice-Chancellor, Nitte (DU), Mr Ajith Joshi Co-coordinator, and Prof. Dr Demian D'mello, HOD, Computer Science & Engineering, Canara Engineering College, Benjanapadavu, Mangaluru. Prof. Dr Iddya Karunasagar, Advisor- Research and Patents Nitte (DU) in his welcome remarks explained how collaborations help to demystify patentability of technologies and aid in moving student projects that are left in the shelves of the institutions to small start-ups.

Prof. Dr Indrani Karunasagar briefed on the genesis of the agreement and how research collaboration can benefit the local societal problems, especially of the rural sector. She outlined the need for an MoU to enable a formal platform for handholding the young student and staff.



Academia-Industry meet



Dr Azad Dubey
BVA Director
Mumbai



Mr R Anand
Mangalore
Biotech Lab

CAMPCO officials discussed the issues of areca industry with TEC officials who have assured them of finding recourse to their problems. Research will be planned for effectively solving the problems and to develop products of nutraceutical value from areca and cocoa.

Industry partners from Blue Vision Aqua Private Limited and Mangalore Biotech Lab visited the facility for personal discussions related to sample analysis by TEC. Under the MoU, internship in Marine Biotechnology (hatchery, aquaculture, diagnostics) and Food Safety and water quality testing was agreed upon.



Eshanya Beverages OPC Pvt Ltd approached TEC for the development of beverage from betel leaves. The product has undergone organoleptic tests for consumer acceptance and is market ready. This technology was developed at the Food Safety and Biotechnology Laboratory of Nitte University Center for Science Education and Research and facilitated by TEC.

Project development with Salem Microbes Pvt Ltd

A project on rapid detection of *Salmonella* in foods was developed in partnership with Salem Microbes Pvt Ltd. This technology is important for the food industry which has to meet FSSAI standards of zero *Salmonella* in processed foods. Currently available methods take 3-5 days to complete, but the proposed technology would be able to deliver results in one working day.

Webinar on world food day

‘Grow,
Nourish,
Sustain, Together’

Fri, October 16 2020



‘Innovative Food Processing Technologies to accelerate the growth of the food processing sector in India’. The Webinar was moderated by Dr Mamata Bangera and Dr Feby Lukose, scientists at NU-TEC working in the food technology division of NUCSER.



“Food safety is everyone’s responsibility. Widespread collaboration and contribution of all farmers, food processors, industrialists, food scientists and retailers across the food supply chain, underpinned by robust governance, agreed international standards and harmonized regulations are essential to food safety”

Dr S. Dave
Former Advisor in FSSAI



“ Innovative technologies are the key to building more robust food processing system. We need to keep experimenting continuously because the consumers’ needs are dynamic and not static. Today’s consumers are well informed and are looking for foods that render health benefits and not just fill the basic needs

Dr Eram S. Rao
HOD, Food Technology, Bhaskaracharya College of Applied Sciences



“The quality of water has become a contentious issue as contamination can be due to several reasons: microbes, chemicals, physical parameters, algal toxins, parasites, pesticides etc. Hence we need to depend on various kinds of water purifiers to address the deteriorating water quality for different types of contamination. Keeping a check on water pollution and regular monitoring is important as water, the elixir of life, is becoming scarce and needs to be reused as much as possible.

Prof. Dr Indrani Karunasagar,
Director DST-NUTEC

World Food Day - 2020

DST-NUTEC, NUCSER

Theme:
Grow, Nourish, Sustain Together

DST-TEC

Resource Persons

Prof. Dr. Indrani Karunasagar
Director, Projects & NUTECH
Nitte DU

Prof. Dr. Iddya Karunasagar
Rtd Senior Food Safety Officer
FAO Rome, Research & Patents
Nitte DU

Dr. S. Dave
Former Advisor FSSAI &
Chairman, Codex Alimentarius
Commission

Prof. Dr. Eram Rao
Head, Food Tech, Bhaskaracharya
Coll. Appl. Sci. Univ. Delhi

Moderators

Dr. Mamatha BS
Assistant Professor
NUCSER

Dr. Feby Luckose
Senior Project Associate
NUCSER

Discussion Topics:

- The national context of food safety
- Innovative food processing technologies to accelerate the growth of the food processing sector in India

Registration Link:
<https://form.jotform.com/202870473399465>

A webinar on the occasion of “World Food Day” was organized under DST NU-TEC platform on October 16, 2020. The objective was manifold and included discussion on food safety and innovative food processing technologies to accelerate the growth of the food processing sector in India. Prof. Dr Iddya Karunasagar gave the introductory remarks, wherein, he highlighted the theme for world food day 2020 “Grow, Nourish, Sustain, Together. He also presented a glimpse of the role of UN Organizations such as FAO and WHO on food safety and food security as well as guidelines set by these bodies towards food regulation. Dr S. Dave, an eminent food scientist and former Advisor in FSSAI, has been the Chairman of Codex Alimentarius Commission (2011-2014). He enlightened the participants on ‘The national context of food safety’. Dr Eram S. Rao, Vice Principal and Head of the Department of Food Technology of Bhaskaracharya College of Applied Sciences, University of Delhi, educated the audience on the topic entitled



Dr Iddya Karunasagar-Invited Expert

Event: Vaishwik Bharatiya Vaigyanik Summit (VAIBHAV), organised by the Government of India, October 02, 2020.

Topic: Technological inputs for Aquatic Animal Health Management



Dr Krishna Kumar B

Event: 8th Annual Symposium- Coastal Karnataka Chapter & 89th Annual Meeting of the Society of Biological Chemists (India), Organised by Manipal School of Life Sciences, November 18, 2020.

Topic: In search of flesh eating bacteria, *Vibrio vulnificus*, 30 years of research in India



Dr Iddya Karunasagar

Event: ‘Shuddha Jala - Swaccha nela’, organized by Radio Manipal 90.4FM Community Radio Station sponsored by Govt. of Karnataka (Rural Drinking water and sanitation department), November 26, 2020.

Topic: Types of water pollution and its treatment

YouTube Link: <https://www.youtube.com/watch?v=cewAaxYEldg>



Dr Iddya Karunasagar

Event: Inception workshop for implementation of ICAR-FAO-TCP on AMR in India, December 10, 2020.

Topic: Effective mitigation of AMR risk from the production of key aquaculture commodities

Dr Iddya Karunasagar & Dr Smitha Hegde

Event: ‘Shuddha Jala - Swaccha nela’, organized by Radio Manipal 90.4FM Community Radio Station sponsored by Govt. of Karnataka (Rural Drinking water and sanitation department), December 25, 2020.

Topic: Grey water

YouTube Link: <https://www.youtube.com/watch?v=CPVcYjrpk2A>



Dr Smitha Hegde

Event: Visit to Nitte Meenakshi Institute of Technology (NMIT), January 12, 2021.

Topic: Green initiative programme and services and consultancy offered by DST NU-TEC

Prof. Dr Smitha Hegde presented the activities of Nitte University Green Initiative Projects (NUGIP) followed by an interactive session. NMIT welcomed the suggestions for green initiatives and will implement the same with continued support from NU-TEC Nitte (DU). The event was facilitated by Dr Sanjay HA, Professor & HoD, Dept. of ISE, NMIT.



Dr Indrani Karunasagar

Event: Expert committee meeting to evaluate National Agricultural Science Fund, Indian Council of Agricultural Research, Government of India, January 28, 2021.



Prof. Indrani Karunasagar is an expert member nominated for three years to evaluate projects in the strategic area “Biotechnology, Genomics, Allele mining in plants animals and fisheries”.



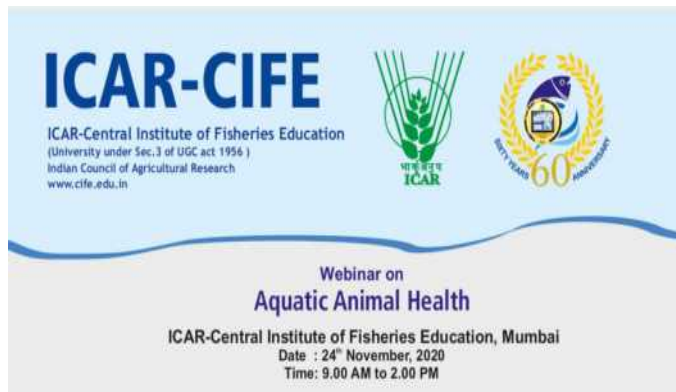
Webinar on aquatic animal health

Organized by Indian Council of Agricultural Research and Central Institute of Fisheries Education, Deemed University

24 Nov, 2020

Highlights

In his opening remarks, Dr Iddya Karunasagar spoke about the previous cycles of emergence and spread of diseases in aquaculture systems and the need to adopt preventive measures, considering the complex interactions between the host, pathogen and environment. He explained about global spread of diseases, mainly through transboundary movement of live animals. Outlining the status of vaccines in aquaculture, he discussed approaches to manage diseases problems in invertebrate health management (eg shrimp culture). He highlighted the continuing problem of residues of antimicrobials and antibiotic resistance in products of aquaculture. The need for adopting one health approach in managing the problem associated with emergence and spread of antimicrobial resistance was explained vividly.



Dr Iddya Karunasagar was Technical Chair for the webinar on Aquatic Animal Health Management organized by the Indian Council of Agricultural Research (ICAR) Central Institute of Fisheries Education, Mumbai, which had international speakers – Dr Arun Dhar from Texas A&M University, US; Dr. C.V. Mohan from World Fish Center, Penang, Malaysia, Dr Sudheesh from Merck Animal Health, US, Dr. Soowannayan from Mahidol University, Thailand. Industry perspective was provided by Mr. Ravi Kumar of Vaishaki Biomarine, Andhra Pradesh. Following the talks, there was a panel discussion involving leading researchers in the field of aquatic animal health in India. In his closing remarks, Dr Iddya Karunasagar urged the academia and industry to work together in overcoming the field level problems of aquatic animal health and suggested that they work together for their mitigation.

IDDYA KARUNASAGAR

Event: One day online workshop on “Patent filing in life Sciences”, Organised by Department of Studies in Botany, Davangere University, December 30, 2020.

Topic: Demystifying patenting

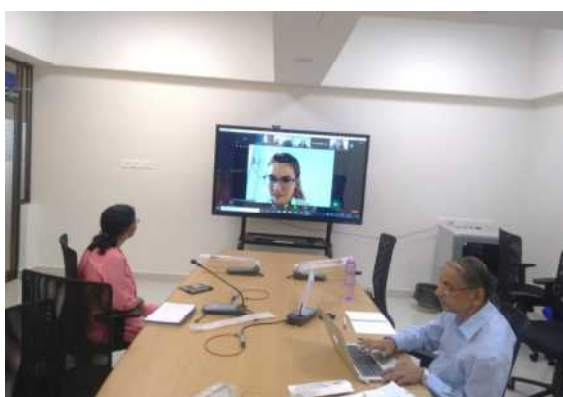




Virtual workshop on bivalve mollusc sanitation

Organized by Food and Agriculture Organization (FAO) – Center for Environment, Fisheries and Aquaculture Science (CEFAS)

9 December 2020



Dr Iddya Karunasagar delivered an invited talk at the Food and Agriculture Organization (FAO) – Center for Environment, Fisheries and Aquaculture Science (CEFAS) of United Kingdom Virtual Workshop on bivalve mollusc sanitation held during Dec 9-11, 2020. Dr Karunasagar spoke about the FAO/WHO Technical Guidance for the Development of Growing Areas Aspects of Bivalve Sanitation Programme. While at FAO, Dr Karunasagar played a key role in the development of this guidance document through a series of Expert Consultations and field trials in Africa. According to FAO estimates, global bivalve mollusc production in 2018 was 17.7 million tonnes valued at 34.6 billion US\$ with international trade valued at 4.26 billion US\$. However due to filter feeding nature of bivalve molluscs, they can accumulate pathogens and toxins from the environment. In many parts of the world, bivalves like oysters and mussels are consumed raw and therefore, from food safety perspective, it is very important that they are grown in very hygienic water. Though the international food safety standard setting body, Codex Alimentarius Commission has standards for live and raw bivalve molluscs and a Code of Practice for their production, often the details provided are not adequate for countries to start their own mollusc sanitation programme.



Food and Agriculture Organization of the United Nations



Cefas INTERNATIONAL CENTRES OF EXCELLENCE



Centre for Environment Fisheries & Aquaculture Science

Highlights

Dr Iddya Karunasagar explained how FAO/WHO brought out the guidance document, and provided advice on how to start by developing a risk profile of the growing area, assessment of the growing area, monitoring and classification indicating suitability of molluscs to be consumed directly or after subjecting to depuration or post-harvest processing. He also explained about the aspects of growing area management and annexes providing templates that can be used for documenting each of the steps.





Invited talks at St Josephs Engineering college, Vamanjoor

05 January, 2021

Highlights of the talk by Dr Iddya Karunasagar

The presentation included the following: Regulatory framework for patenting in India, eligibility for grant of patents, examples of product and process patents, Patent act Sections and rules that exclude patents and the process and steps involved in filing a patent application, tips for carrying out "prior art search", databases for publication search and patent search, provisional and complete applications and circumstances for filing these. The timeline for different steps in patenting was also informed. Further the steps in applying for international patents and the resources available from the World Intellectual Property organization was outlined. The talk focused on preparing research application for support from funding agencies, their priority areas, general format of research proposals, identification of specific research topics and research questions, formulating objectives and work plan, outlining timelines with the Gantt chart, budgeting with justifications, major points of consideration that evaluators and expert committees would look at etc. was presented at length.

Highlights of the talk by Dr Indrani Karunasagar

How to write a good publication for knowledge dissemination was highlighted and this should be an outcome of any piece of research carried out. Why should one publish? Is there something worth publishing? Does the work add to any existing knowledge? All of these questions should be the basis of writing a paper. Deciding where to publish, keeping in mind the journal coverage and to choose the right one, the readership, the length of time from submission to publication, together with indexation, the journal impact factor and citation score should be the priorities. The audience were informed as to what the editors and reviewers look for in a manuscript. Therefore, good science which is a well planned, well executed study, with originality in it is a quality requirement. All aspects of writing of the paper were detailed. Unlike a voluminous thesis which is like a kitchen sink, the paper should be a jewel that is churned out of the thesis. The lifecycle of a publication starting from submission through the publishing process was presented. Other aspects to be borne in mind such as antiplagiarism check, consent of all authors that are crucial to quality control, to have a large readership and citation were explained. English language that would permit it to be articulate, constructive, insightful with quality parameters for good science was the focus of the talk. On a final note, the participants were informed to live with rejection, revision and refinement of manuscripts sent for publication before they rejoice its acceptance.



Dr Smitha Hegde interacts with scientists at the CIMED, Narayana Hrudayalaya, Bangalore

13 January, 2021

Dr Smitha interacted with the Composite Interceptive Med Sciences Laboratories Private limited (CIMED), the R&D company working towards creating a novel genre of therapeutics. The visit is consequent to the MoU developed to facilitate joint ventures in research related to plant based therapeutics. Prior discussions between the groups at NUCSER have resulted in Academic Industry Translational Research (AITR) joint application submitted to DBT call for the Accelerated Translational Grant for Commercialization (ATGC), 2020-2021.








IPR with a focus on patenting in India

Organized by: Institution Innovation Council, Nitte (DU)

OPENING REMARKS



Prof. (Dr.) Satheesh Kumar Bhandary
Vice-Chancellor
Nitte (DU)

SPEAKER



Dr. Iddya Karunasagar
Advisor- Research & Patents
Nitte (DU)

MODERATOR



Prof. (Dr.) Srinikethan
Director, Technical Research
President IIC, Nitte (DU)

COORDINATOR



Dr. Praveen Kumar Shetty
Director, Research & Development
Nitte (DU)

Theme:
Intellectual Property Rights

Date: 22nd January 2021
Time: 2.30 pm - 3.30 pm



MHRD-Category 'A' | NAAC-'A' Grade
NIRF 2020-74th Rank | Diamond Rating in QS I-GUAGE
QS Asia Ranking - 401-450 Band | QS-I-GUAGE E-LEAD Certified

Registration link: <https://form.jotform.com/210140493632446>



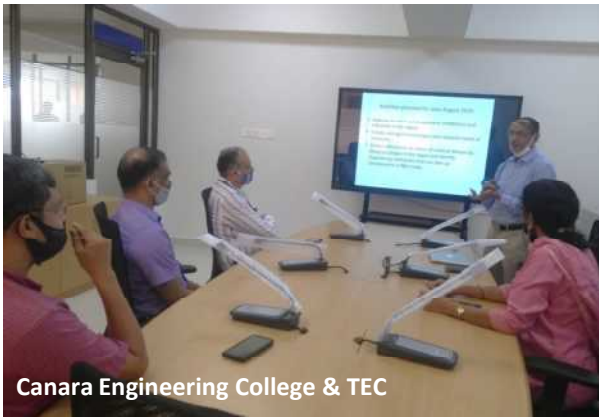
Webinar on “IPR with a focus on patenting in India” was organized by Institution Innovation Council, Nitte (DU) on January 22, 2021. Dr Karunasagar, , Research and Patents, enlightened the audience on all types of Intellectual Property Rights with a focus on patenting in India with appropriate examples. He explained about copyrights, trademark, designs, geographical indication, TRIPS and territorial jurisdiction. Information on legislative framework for IPR in India and salient features of patent law was presented. He also summarized pathways of getting International patents through Patent Cooperation Treaty (PCT).

PROJECT DISCUSSIONS HELD

Project topic	Institutions involved	Status of project
Device for detection of cervical cancer and taking samples for PAP smear	KSHEMA and NMAMIT	Submitted to DST
Non-invasive monitoring of anemia and hypertension	KSHEMA and NMAMIT	Submitted to DST
Device for rapid detection of Urinary tract infection	KSHEMA and NMAMIT	Submitted to DST
Device for hygiene monitoring in food industry	NUCSER and NMAMIT	Submitted to DST
Cold press juice producer	NUCSER and NMAMIT	Submitted to DST
IoT and peltier based vaccine carrier	NUCSER and NMAMIT	Submitted to DST
Electrochemical sensors for real-time sensing of multiple biomarkers in sweat	NUCSER and NMAMIT	Submitted as DBT RA project
Biocontrol of mastitis in cattle using bacteriophages	NUCSER, Madras Veterinary College Salem Microbes Pvt Ltd	Submitted to BIRAC
Rapid and sensitive detection of <i>Salmonella</i> in foods	NUCSER and Salem Microbes Pvt Ltd	Submitted to BIRAC



TEC facilitates academia collaborations: Handholding professionals



Canara Engineering College & TEC



St Josephs Engineering College & TEC

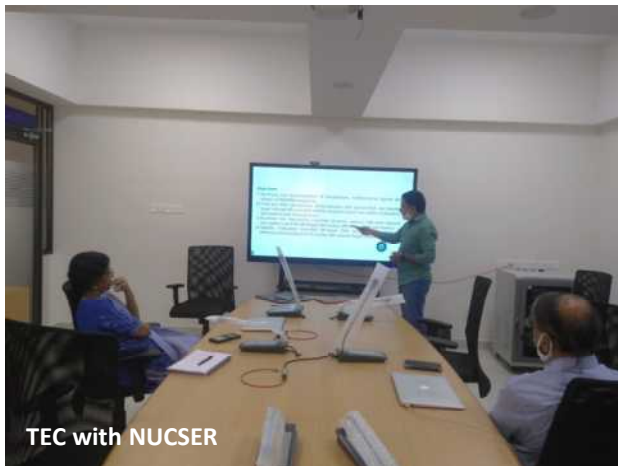
Initiating societal projects for national and international funding



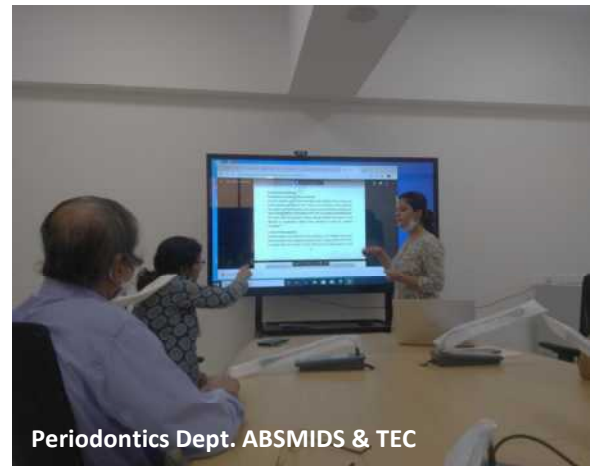
OBG Dept. K S Hegde Hospital, TEC & NUCSER



Cardiology Dept. K S Hegde Hospital, MMM, Chennai (Online) & TEC



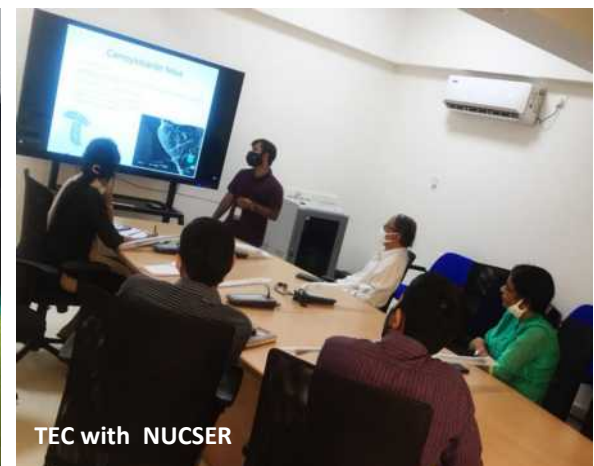
TEC with NUCSER



Periodontics Dept. ABSMIDS & TEC



Examining the orthodontics innovation with ABSMIDS, for patent application



TEC with NUCSER



Dr Ram Siddappa, Senior Business Development and Licensing Manager, The Knowledge exchange office of Leiden University & Leiden University Medical Centre, The Netherlands, advising technology transfer of research results with promise of application



Prof. Dr Arun Isloor, HOD of Chemistry, NITK Surathkal visits NU-TEC and discusses possible research innovation and patents. NU-TEC will facilitate his inputs to the VGST project awarded to Prof. Dr Smitha Hegde, Dr Anurag Sharma on “Developing sustainable technologies for mitigating heavy metal pollution”



Discussion on preparing a joint project on “microplastic and pathogen transport” between Dr Sabu Thomas, RGC, Trivandrum & NUCSER-NUTEC Dr Krishna Kumar, Dr Ramya , Profs Karunasagars



Prof. Vinod Aranha, Director NIA and Mr Anil Devadiga, faculty, NIA in a meeting with TEC team on possible areas for collaboration



TEC officials enlighten the faculty at Canara Engineering college regarding research opportunities and the role of NU-TEC in facilitating development of research projects



Initiation meeting with the Director, Vice Principal and officials of St Joseph's Engineering College to charter the course of research collaborations and facilitation by NU-TEC