

VIDYA

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Making the Breaking Point

Prof. Ranjith Senaratne assumed duties as the Chairman of the National Science Foundation on 23rd January 2020 with the blessings of Maha Sangha. Dr Bandula Gunawardane, Hon. Minister of Higher Education, Technology and Innovation and Mr Thilanga Sumathipala, Hon. State Minister of Technology and Innovation and several other distinguished guests from universities and public & private sector institutions attended the function. After the Pirith Chanting Ceremony, the Hon. Minister of Higher Education, Technology and Innovation and the Chairman addressed the gathering. The Chairman/NSF first and foremost expressed gratitude to the NSF for the support extended to him throughout his long career development as a scientist. As such, he has a commitment and always will strive for excellence in the activities carried out by this institution and see that the NSF will ultimately yield the expected results and contribute to the national development and wellbeing of people as of the top priority of the present Government. His conscious, concentrated and concerted effort will be in place throughout to realize this objective, he said. Addressing the gathering further Prof. Senaratne mentioned that even though, the physical status of NSF is small, the role played by the NSF is very high during the past five decades. Stating that, he said for further growth of the institute the dedication, devotion and commitment of the staff incorporated with perseverance, persistence and passion to the work is important. Prof. Ranjith Senaratne has served as the Vice-Chancellor of the University of Ruhuna, Chairman of the Ocean University (National Institute of Fisheries and Nautical Engineering) and Vice Chairman of the University Grants Commission prior to taking up this appointment. He has over 20 years of experience in senior management positions.



NSF Awards Winners at Media Briefing

A press conference was held on the 17th January 2020 at the NSF with the winners of the NSF Research Awards. The winners under specific fields of science, such as Environment and Biodiversity, Basic Science, Biotechnology and Engineering Sciences joined the media briefing with simple informative presentations with research findings. The activity was conducted by the NSF Media Unit with a view to disburse scientific research results to the media.



Ms Nazeema Ahamed/Acting Director General of the NSF and Mr Manuja Karunaratne, Head/ NSLRC and Media coordinator addressing the media personnel

Exploring Knowledge on Blockchain Technologies

Blockchain technology has attracted extensive attention in the recent past in Sri Lanka. It is a simple and decentralized method of passing information in fully automated and safe manner and can be applied to many fields providing unalterable public records of digital transactions. Blockchain-based applications are springing up in numerous fields including financial, insurance, health care, fraud detection services and education.

A panel discussion on Blockchain Technology and its Development was held on the 7th February 2020 in the NSF Auditorium providing an ideal opportunity to discuss and share the knowledge on Blockchain and to see the possible applications for Sri Lanka to ensure secure data transactions. Mr Chim Hinidumage, CEO/Co-Founder Fidenz Technologies, Dr Chandana Gamage, Department of Computer Science & Engineering, University of Moratuwa, Dr Srinath Perera from WSO₂ and Dr Kutila Gunasekara from University of Moratuwa served as Resource Persons.

The program was moderated by Dr Chandra Embuldeniya, Chairman, NSF Working Committee on Science, Technology, Engineering and Mathematics (STEM) Education.

Over 62 participants from various government and private sector institutions including the banking, education and the industrial sectors took part in the discussion.



Dr Chandra Embuldeniya/Chairman of the NSF Working Committee on Science, Technology, Engineering and Mathematics (STEM) Education moderating the Programme

Identifying Challenges in Research Commercialization

Commercialization of research is vital in order to deliver impactful contributions to the socio-economic development and well-being of people of the country. Addressing the prevailing issues in research commercialization, a stakeholder meeting was held on February 06, 2020 at the NSF.

Around 30 participants from various stakeholder institutions including Business Linkage Cells in State Universities, Government Research Institutions, Ministries, Chambers and other relevant State Institutions took part in this meeting to share their views.

Dr A. M. Mubarak, Chief of Research & Innovation/ Sri Lanka Institute of Nanotechnology detailed the issues in research commercialization from public sector point of view and Mr Samantha Kumarasinghe, Chairman, Nature's Beauty Creations Ltd elaborated the issues from Business Enterprises sector point of view.

The discussion was moderated by Prof. M. J. S. Wijeyaratne/ Chairman, NSF Working Committee on S&T Policy Research. Participants engaged in discussions intensely expressing their views and experience on various factors hindering successful research commercialization in Sri Lanka.



Student Enthusiasm is rising with SRPC

The final round of the Science Research Projects Competition 2019 was held on the 12th February 2020 in the NSF Auditorium. Prof. Ranjith Senaratne, the Chairman of the NSF, inaugurated the session with an inspiring introductory speech together with a welcome note addressing students and teachers. He highlighted the merit of scientific research and the potential of students to grow as good researchers starting from early days in school. Twenty-two selected winners at the first round of the SRPC were presented certificates.

Ms Nazeema Ahamed/Acting Director General also addressed the students and teachers after the award of certificates.

Twenty-two projects selected at the 1st round were placed at the final competition. After a rigorous evaluation process, 10 projects were selected by the Panel of Judges to be placed at the competition at national level. Active participation of students from all over the country was noteworthy throughout the competition.



Prof Ranjith Senaratne/Chairman of the NSF addressing the students and teachers



Biosimilar Products for Sri Lankan Pharmaceutical Industry

A session on Biosimilar products for Sri Lanka pharmaceutical Industry was organized when Dr Lawrence Banks/Director General of the International Centre for Genetic Engineering and Biotechnology (ICGEB) visited Sri Lanka to take part in the SLASS Annual Sessions held in December 2019.

Global Biosimilars Market is set to surpass USD 69 billion by 2025; according to a new research study published by Global Market Insights, Inc. Cost effectiveness of biosimilars will be a major market boosting factor as it will lead to growing demand and adoption rate. Biosimilars are usually less expensive as compared to other reference products. Implementation of safe and cost-effective biosimilars will further lead to health improvements reducing health expenditure.

Foreseeing the potential of biosimilars revolutionizing the local pharmaceutical industry, members of the Pharmaceutical Association, Pharmacology Departments of Universities and other Public and Private R & D Institutions were invited to share the knowledge and experience of Dr Lawrence Banks.

Dr Banks in his presentation enlightened the gathering with six areas which is instrumental in entering into product manufacturing; Material availability, Technology Transfer from the ICGEB, production information, Cutting-edge scientific research in ICGEB laboratories, Services and Advice.

Dr Banks shared information of some on-going research in the areas of infectious diseases, non-communicable diseases, medical biotechnology, industrial biotechnology, plant biology and biotechnology being conducted at the ICGEB highlighting the following points :

- Over 400 biosimilars entered clinical trials
- Over 350 biosimilars gained clinical approval
- Monoclonal antibody market expected to be worth not less than 75 billion USD
- Global invitro diagnostic market forecast to reach 75 billion by 2020
- Bio-generic market is expanding rapidly

Dr Lawrence Banks further revealed that the Biotechnology Development Group (BDG) at ICGEB deliver support to local pharmaceutical manufacturing companies in member countries to improve drug availability at a more affordable price, to develop simple innovative technologies for production of biosimilars. EPO, IFN alpha 2A/B, GCSE, IFN beta, Insulin are products developed in other member countries using technologies transferred by the ICGEB. Information on ICGEB developed technologies were also shared among participants.



Self-compacting in-situ cast Mud-Concrete load-bearing walling system

Mud-Concrete is a sustainable, novel earth-based walling material developed by Prof. Rangika Halwatura (Principal Investigator) and Dr. Rizna Arooz (Research Student) at the Faculty of Engineering, University of Moratuwa, under the Research Grant RG/2015/EA&ICT/02. It is a mixture of soil, cement as a stabilizer in very low quantities and water. The precise gravel percentage governs the strength of the Mud-Concrete.

Most importantly, the introduced self-compaction method brings solutions to remove the labour intensive construction methods and control the cost, quality and time during construction. This novel walling system was patented (Patent Number: 18762/ International patent classification: E04C1/00) under Sri Lankan property act No. 36 of 2003. The technology is currently being used in the construction industry as CSR projects in Sri Lanka.

Prototype in-situ cast Mud-Concrete load-bearing wall models made for laboratory testing



Assembling the formwork - Process of in-situ cast Mud-Concrete wall construction

Promising vaccine candidate against Dengue virus

An effective vaccine for dengue is currently a priority need worldwide. However, the development of anti-dengue vaccines is challenged by the observed high variation in immune response against infection by different dengue virus (DENV) serotypes or their genetic variants. Research work carried out at General Sir John Kotelawela Defence University by a three-member research team consisting of Prof. Charitha Goonasekara (Principle Investigator), Dr Prasad Premarathe (Co-Investigator) and Dr Mahesha Nadugala (Research Student) proposed an alternative strategy to the commonly used tetravalent-type vaccine design strategy to focus on a conserved vaccine.

The research team was able to identify five dengue protein targets, which were conserved, broadly immunogenic and neutralizing for the 4 dengue serotypes demonstrating to be good candidates for an epitope-based vaccine against specific targets of dengue virus. The investigators have already taken the initiative to develop the vaccine further and have identified several other dengue protein targets, which are ideal markers in the diagnosis of dengue infection. These are already being developed into rapid diagnostic kits which can be commercialized.

The research was successfully completed with 3 articles in peer-reviewed index journals and 2 national patents.

Smart Textiles – Antimicrobial textile materials

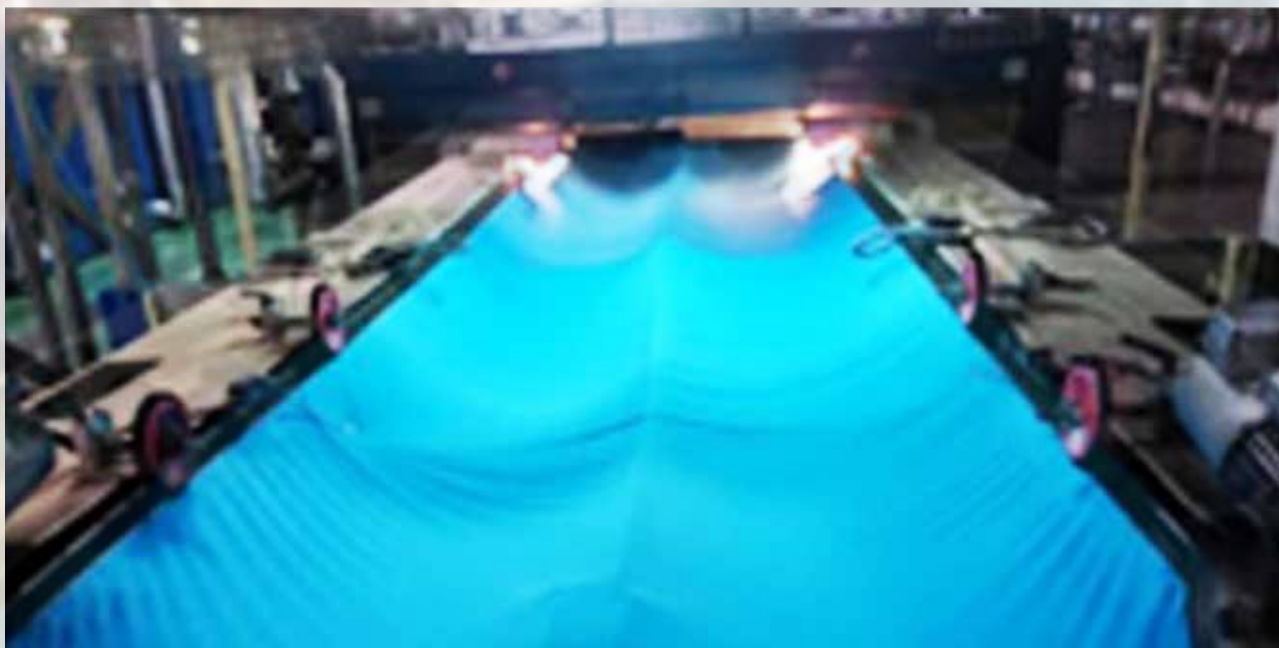
Cotton is the major fabric used in various applications including medical textiles, apparel, commercial textiles, automotive, home textiles, and other such applications. However, the cotton being natural makes it more susceptible to microbial attack. Therefore, making antimicrobial textiles using cotton has a great market demand and potential.

“The global antimicrobial textiles market size was USD 9,468 million in 2019 and is projected to reach USD 12,313 million by 2024, at a CAGR of 5.4% during the forecast period”(Source: Research & Markets).

Earmarking the global trend towards antimicrobial textiles, a team of researchers from the University of Peradeniya manufactured antimicrobial textiles using the financial support given under a Technology Grant. (TG/2014/Tech-D/04)

The project encompasses the application of nanotechnology in producing antimicrobial cotton textiles and was conducted in collaboration with the Teej Lanka PLC at Avissawella.

Method of manufacturing anti-microbial textiles were integrated into industrial flow processes and bulk trials of 100 m x 100 m fabrics were carried out at the factory scale. TeeJ Lanka PLC is working towards bringing the product to global market through their international buyers.



‘Test trials in progress at TeeJ Lanka PLC’

NSF marks its presence at INNOTECH 2020 National Exhibition

A three-day National Exhibition on Science, Technology & Innovation was held at Homagama, Pitipana from 11 – 13 March 2020. The NSF demonstrated its major activities at the exhibition through the outcomes of the different grant schemes. With the help of universities and private sector NSF was able to demonstrate few Artificial Intelligence (AI) products too.



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