NSF AWARDS 2024

NATIONAL SCIENCE FOUNDATION

16TH JULY 2025

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MESSAGE FROM THE CHAIRMAN

It affords me great pleasure to extend my congratulations to all the recipients of NSF Awards today. At this Awards Ceremony we are recognizing NSF Research Awards winners, SUSRED Award winners and NSF HCP Award winners.

The NSF has a long and proud history in building science ecosystems in the country. It began as the National Science Council in 1968 and evolved into its current form in 1998. From modest beginnings with just 340,000 rupees in funding and nine staff members, it now supports over 50 research institutes and 15 universities with a science budget exceeding Rs. 800 million. This progress reflects our growing role in Sri Lanka's science and innovation ecosystem.

However, challenges remain. According to the World Bank, Sri Lanka has only 106 full-time R&D personnel per million people compared to India (253), Pakistan (336), Malaysia (2,185), and South Korea (7,980). Our R&D investment (GERD) stands at just 0.12% of GDP, far below the 1% recommended by UNESCO for developing nations. These numbers highlight the need to increase both the quantity and quality of research supervision and to better utilise our intellectual potential, making more investment necessary in the future.

Currently, many researchers in Sri Lanka spend less than 30% of their time on research, while their counterparts in developed countries typically allocate between 50% and 70% of their time to research. It is vital that we not only increase the number of researchers but also empower them to devote more time to high-quality research.

The NSF addresses these issues by implementing strategic changes, such as the National Nanotechnology Initiative, thematic research programmes, and enhanced partnerships between the public and private sectors. We are also engaging people from around the world by using digital platforms that connect Sri Lankan scientists abroad with researchers in Sri Lanka.

Over the years, the NSF demonstrated how both hard and soft sciences can collaborate effectively. This was a call to break down traditional discipline barriers and promote collaboration between different disciplines. This vision aligns with our broader goal of transforming Sri Lanka into a knowledge-based economy that supports the Sustainable Development Goals (SDGs) 2030.

Finally, I would like to thank all the Award winners and past and present supervisors who have contributed to enhance the R&D landscape in Sri Lanka. Your contribution has been a crucial pillar of our scientific future. I encourage more academics to embark on this transformative journey and contribute to building a research culture that is both globally competitive and locally relevant.

Prof. Saman Seneweera
Chairman
National Science Foundation
Colombo 07

July 2025

MESSAGE FROM THE DIRECTOR GENERAL

It is with great pride that I pen this message as the Director General of this esteemed Institution that is the National Science Foundation of Sri Lanka, at this nationally important event - NSF Awards, 2024, where we recognize, felicitate and encourage achievements of Scientists through Research Awards, SUSRED Awards and Highly Cited Paper Awards.

The NSF, on its way towards realizing its vision to be the nation's premier driving force in promoting Science, Technology and Innovation for economic and social prosperity of Sri Lanka, has been assisting the scientific community by all possible means, through its various Schemes, and has also been continuously improving itself by introducing new schemes and programs: maintaining high standards, building research capacity and enhancing quality and transparency throughout. Being an award winning leading STI organization and having 56 years of service to the nation towards progressive advancement of the National Science Technology Innovation (STI) ecosystem, NSF has substantially contributed to socio-economic development and wellbeing of the people. We are continuously committed to deliver its mandate aligning with the National Policies and the Sustainable Development Goals (SDGs) through the recently launched 'Lab to Market' model and the 'Research into Practice' model which are well aligned with the 'Scientific Solutions for the Society'; a high priority national concern.

We proudly celebrate the 40th Anniversary of NSF Research Awards, since its launch in 1984, where we have felicitated NSF Research Grantees, for their successful conduct and completion of NSF Research Grants. The public interest in NSF Grants is evident by the large number of Research Grant Applications received by the NSF, annually, and confirms the trust the Scientists have on NSF.

The SUSRED Awards Scheme, inaugurated in 2011, has since recognized a multitude of supervisors from across the nation for their unwavering dedication in guiding MPhil. and PhD candidates towards success. We strongly believe that this scheme serves as a continuous source of motivation for academics to engage in supervisory roles, nurturing the next generation of researchers, through thick and thin.

Hereby I pass my heartfelt congratulations to all the Award Winners for their unwavering efforts and enthusiasm in conducting research of high scientific standards and for supervising young researchers in an exemplary manner. Your efforts will certainly go further than the Award bestowed upon you on this day, and pave the path in creating a conducive research and innovation ecosystem in Sri Lanka. I wish the Award winners great success in all your future endeavors.

Dr Sepalika Sudasinghe
Director General
National Science Foundation
Colombo 07

July 2025

INTRODUCTION

The NSF Awards Ceremony is organized annually to confer awards under the following schemes of the NSF:

- NSF Research Awards
- NSF Technology Awards
- Support Scheme for Supervision of Research Degrees (SUSRED)
- NSF HCP Awards

NSF Research Awards

The NSF Research Awards are given annually to researchers who have made outstanding contributions for the advancement of science through NSF funded research projects. This award scheme was initiated in 1984 as Merit Awards. The award is also meant to motivate recipients of competitive research grants to conscientiously maintain high standards of scientific research while at the same time helping them to enhance their own career prospects as recognized scientists. The award winners are selected through a thorough evaluation process implemented by NSF.

NSF Technology Awards

The two technology grant schemes "Support for technology development" and "Support for startup businesses based on new technologies" are implemented with a view to supporting innovators to develop, assimilate and use technologies for wealth creation. The grant schemes are targeted at promoting locally developed technologies for socio-economic development of the country. Another aim is to motivate grant recipients to conscientiously maintain high standards of partnerships with the public and private sectors. This awards scheme was implemented for the first time in 2014 for successful technology grant recipients.

Support Scheme for Supervision of Research Degrees (SUSRED)

The awards for the Support Scheme for Supervision of Research Degrees (SUSRED) was implemented in 2011 to motivate, support and recognize scientists/ engineers engaged in supervising postgraduate students conducting research in all areas of Science and Technology. This scheme will also encourage universities and research institutions to promote and facilitate postgraduate research training.

NSF HCP Awards

National Science Foundation (NSF) has launched the Highly Cited Paper Awards (HCPA) with the objective of recognizing outstanding contributions to scientific advancement through publications in the Journal of the National Science Foundation (JNSF) and the Sri Lanka Journal of Social Sciences (SLJSS).

Articles published during 2019 – 2025 and citations received for the same by May 2025 were considered for evaluation. SCOPUS records were used as the data source. The most cited articles were selected for recognition.

The awards will be presented in the following categories:

Award Category	Description
JNSF (Foreign)	HCP Award for Foreign Authors with the highly cited publication in JNSF
JNSF (Local)	HCP Award for Local Authors with the highly cited publication in JNSF
SLJSS (Foreign)	HCP Award for Foreign Authors with the highly cited publication in SLJSS
SLJSS (Local)	HCP Award for Local Authors with the highly cited publication in SLJSS

NSF RESEARCH AWARDS

NSF RESEARCH AWARDS 2019

Project Title : **Genetic diversity and management of cabbage white mould pathogen, *Scleotinia sclerotiorum*, and feasibility of Anaerobic Soil Disinfestation (ASD) and Bio-Fumigation (BF) based disease management for upcountry vegetable production system**

Grant No. : RG/2015/BT/04

Outcome/s of the project:

The project was based on a soil-borne pathogen, *Sclerotinia sclerotiorum,* The pathogen can survive in soil for many years. It was found that the pathogen could generate new strains in the field. The Anerobic Soil Disinfection (ASD) method was found to be very effective in mitigating the pathogen survival structures. The project was successfully completed with two full papers and nearly 10 abstracts. The findings of the project gained public attention with the newspaper article published in Sinhala. Now the project is at the field validation stage, expanding to other cropping systems as well.

Principal Investigator

Prof. Renuka Attanayake is a professor and the head of the Department of Plant and Molecular Biology, University of Kelaniya. She received her MSc and PhD degrees in Plant Pathology from Washington State University, WA, USA. She is interested in plant pathology, genomics studies, wood decay fungi and population genetics of plant pathogens. She is the team leader of the project.

Co-Investigator I

Mr K. P. Somachandra is an eminent field plant pathologist previously attached to the Regional Agriculture Research and Development Centre, Bandarawela. He obtained his MSc in plant pathology from the University of Putra, Malaysia. He served as the bridge between the laboratory and the field in the current project, bringing the findings to the farmer's hands via field days, farmer meetings and awareness programs.

Co-Investigator II

Prof. C. S. K. Rajapakse is attached to the Department of Chemistry, University of Kelaniya. She obtained her BSc (Honours) in Chemistry from the University of Peradeniya and MPhil and PhD from the City University of New York, USA. Her field of expertise is Medicinal Inorganic Chemistry, with a particular focus on the synthesis of ruthenium(II)-aminoquinoline complexes and metal-free aminoquinolines for the chemotherapy of malaria and cancer.

Research Student

Ms Thirega Mahalingam was the Research Student of the project. After completing her MPhil degree from University of Kelaniya she migrated to UK and now involved in research work. She was able to secure several publications from the project and won best presenter award as well.

Project Title : **Purification of graphite of Sri Lanka as a high value addition**

Grant No. : **RG/2014/EB/01**

Outcome/s of the project:

Under this project a technology was successfully developed to produce high-purity graphite (99% and 99.99%) from three major Sri Lankan graphite mines, Kahatagaha, Bogala and Ragedara, significantly enhancing the value of locally sourced graphite. The outcomes of this project were nationally recognized. The technological know-how was later transferred to a major graphite company, which has since commercialized the process and begun exporting value-added graphite, generating substantial foreign revenue. This knowledge holds further potential to transform the state-owned graphite sector into a profitable enterprise, contributing to national GDP growth through value addition.

Principal Investigator

Dr (Mrs) I. R. M. Kottegoda has 30 years' research experience in materials science and nanotechnology: 45 publications with nearly 3000 citations; 22 patents and 25 Awards, 5 professional fellowships from Fulbright-USA, Endeavour Awards-Australia, JSPS-Japan and Israel. She has been heading-Materials Technology Section of ITI for almost 10-Years now.

Co-Investigator

Ms J. T. S. T. Jayawardane is a PhD student in Materials Science & Engineering at the University of Moratuwa. She has over 12 years' research experience, including 5 years as a Research Engineer at ITI. She has published in 5 international and 1 national journal; 10 conference presentations and holds 3 patents and 2 national awards.

CERTIFICATES OF COMMENDATION 2019

Project Title : **Studies on prognostic markers of oxidative stress and its host genetic polymorphisms and endothelial dysfunction in severe dengue infection**

Grant No. : **RG/2014/HS/04**

Outcome/s of the project:

This study aimed to identify prognostic markers for severe dengue infection in Sri Lanka, with a focus on endothelial dysfunction. Significantly low serum nitric oxide and nitrite levels were observed in Dengue Hemorrhagic Fever patients on day 3 of fever. The Angiopoietin-2/Angiopoietin-1 ratio emerged as a potential biomarker of endothelial damage. *In vitro* studies using patient serum confirmed endothelial gap formation and upregulation of Ang-2. The project led to two international peer-reviewed publications, 12 conference proceedings, and several recognitions, including Presidential Awards for scientific publications. It also enabled a postdoctoral fellowship for Dr. Maheshi Mapalagamage, PhD student of the project at the La Jolla Institute for Immunology, USA.

Principal Investigator

Prof. Sunil Premawansa is Emeritus Professor and former Senior Professor at the University of Colombo, specialized in Immunology, Molecular Biology, and Parasitology. His research focused on infectious diseases like malaria, dengue, and leptospirosis. He has over 90 international publications and has significantly contributed to teaching and advancing immunological research in Sri Lanka.

Co-Investigator I

Prof. Shiroma Handunnetti is a Senior Professor of Immunology at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB), University of Colombo. She obtained her PhD in Parasite Immunology from the University of Colombo and conducted research on infectious diseases. She is the former Director of IBMBB and has a h-index of 34.

Co-Investigator II

Prof. Aruna Dharshan de Silva is Head of Biomedical Lab-2 at Kotelawala Defence University and Adjunct Associate Professor at La Jolla Institute, USA. An expert in immunology, he researches infectious diseases like dengue and tuberculosis, with over 90 publications (h-index: 43) and 12+ years working at leading labs in Sri Lanka with primarily international grants.

Co-Investigator III

Dr Gayani Premawansa is a retired Consultant Physician from Colombo North Teaching Hospital, Ragama. She has taught General Medicine and conducted research on clinical and infectious diseases, contributing significantly to patient care and medical education through her clinical expertise and academic involvement.

Research Student

Dr Maheshi Mapalagamage is a Senior Lecturer and immunologist at the University of Colombo. Her research focuses on dengue pathogenesis, T cell immunity, and infectious diseases. With postdoctoral training from La Jolla Institute, USA, she has received national awards and actively mentors' students while contributing to international scientific publications.

NSF RESEARCH AWARDS 2020

Project Title : **Identification and quantification of previously unexplored chemical and nutritional information about coconut oil and coconut cake**

Grant No. : **RG/2015/AG/03**

Outcome/s of the project:

This research enabled to determine the antioxidant properties of the phenolic extracts of coconut oil and coconut cake and the protective effect of the phenolic antioxidants of coconut oil meal against macromolecular oxidative damage using in vitro and in vivo models. It also lead to evaluating the efficiency of coconut milk-derived phenolics antioxidants on human gut health. The study established the potential role of coconut milk phenolic antioxidants in enhancing cellular defense mechanisms and maintaining probiotic viability in oxidative environments.

Principal Investigator

Snr Prof. Kapila Seneviratne is a distinguished academic at the Department of Chemistry, University of Kelaniya, with over 30 years of experience in teaching and research. He specializes in Inorganic Chemistry, Organometallics, Chromatographic Techniques, and Food Chemistry. He currently serves as Chairman of the University Grants Commission.

Co-Investigator

Snr Prof. Nimanthi Jayathilaka is an eminent academic at the Department of Chemistry, University of Kelaniya, specializing in early molecular markers of severe dengue and chemical and nutritional evaluation of edible oils and antioxidants. Her expertise includes infectious disease biomarkers, nutrition, antioxidant bioavailability, and health impacts of dietary fats.

Research Student

Ms A. N. Karunasiri was a researcher at the Department of Chemistry, University of Kelaniya, Sri Lanka. She specialized in studying the antioxidant properties of coconut oil, coconut cake, and coconut milk, focusing on their protective effects against oxidative damage and their role in enhancing cellular defense and probiotic viability.

Project Title : **Investigation of mud concrete for in-situ cast load bearing walls**

Grant No. : **RG/2015/EA & ICT/02**

Outcome/s of the project:

The research pioneered self-compacting in-situ cast mud-concrete walling, enhancing mix design, durability, energy efficiency, and life-cycle cost for sustainable construction. It resulted in patents, indexed journals, conference papers, and multiple national exhibitions showcasing the product and technology. The project empowered rural and post-conflict communities by providing affordable, eco-friendly housing solutions. It influenced industry standards and earned Presidential recognition in 2018, and a Royal Society travel grant in 2017. Further research expanded its applications into mud-concrete slab systems, reinforcing earth-based materials as viable, cost-effective alternatives in sustainable construction.

Principal Investigator

Prof. Rangika Umesh Halwatura is a highly accomplished academic in Civil Engineering at the University of Moratuwa, where he earned a first-class BSc (Eng.) and a PhD in Structural and Building Services Engineering. He has authored over 225 publications on sustainable materials, green design, BIM, and construction management, and is internationally recognized for his research and inventions, receiving prestigious awards such as the CVCD "Most Outstanding Young Researcher," the 2016 Energy Globe Award (Sri Lanka), and the 2017 TWAS Young Scientist Award.

Research Student

Dr (Archt.) F. R. Arooz, a visionary architect and researcher, specializes in sustainable construction through mud concrete technology. A Senior Lecturer at General Sir John Kotelawala Defence University, she holds a PhD in Civil Engineering. With two groundbreaking patents, including Presidential and Royal Society awards, Dr Arooz is a trailblazer in eco-friendly, affordable housing. Her work isn't just about innovation; it's about making sustainable living accessible to all.

Project Title : **Monitoring the management response following the detection of malaria cases during the phase of malaria elimination in Sri Lanka**

Grant No. : **RG/2014/HS/03**

Outcome/s of the project:

This project was targeted on preventing the re-establishment of malaria to Sri Lanka in future by providing evidence to improve policy, performance and effectiveness of the Anti- Malaria Campaign. The study emphasized the threat of imported malaria and the importance of early diagnosis. Adopting an evidence-based malaria treatment policy in the country by therapeutic efficacy testing led to the introduction of a second-line drug. Reduced risk of malaria specially in tri-forces personnel working on UN Peacekeeping missions overseas will be facilitated by providing evidence for policy on chemoprophylaxis. Disease management is improved by distinguishing re-infections from recrudescent imported malaria infections by validating a molecular diagnostic technique. 9 publications were done in peer reviewed international journals and two higher degrees were awarded under this project.

Principal Investigator

Snr Prof. Deepika Fernando, Senior Professor in Parasitology, Faculty of Medicine, University of Colombo, is a medical parasitologist who has researched and published extensively on tropical infectious diseases - malaria, dengue and leishmaniasis. She has over 150 publications in peer-reviewed scientific journals and has a h-index of 38.

Co-Investigator I

Dr Risintha Premaratne is the Regional Adviser (Malaria) at WHO South-East Asia. Formerly Director of Sri Lanka's Anti Malaria Campaign, he played a pivotal role in malaria elimination in the country and contributed significantly to its WHO certification. With nearly 30 years of experience in public health, including in malaria, immunization and emergency response, he holds medical, public health, and biosecurity degrees from Sri Lanka and New Zealand.

Co-Investigator II

Prof. Shiroma Handunnetti is a Senior Professor of Immunology at Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB), University of Colombo. She obtained her PhD in Parasite Immunology from University of Colombo and conducted research on infectious diseases. She is the former Director of IBMBB and has a h-index of 34.

Co-Investigator III

Prof. O. V. D. S. J. Weerasena is a Professor in Molecular Biology at the Institute of Biochemistry, Molecular Biology and Biotechnology (IBMBB) University of Colombo. He has authored many research publications in international peer reviewed journals and he is a recipient of many awards for research excellence including Presidential Award, Vice Chancellor's Award and Senate award.

Co-Investigator IV

Prof. Sunil Premawansa, Emeritus Professor and former Senior Professor at the University of Colombo, specialized in Immunology, Molecular Biology, and Parasitology. His research focused on infectious diseases like malaria, dengue, and leptospirosis. He has over 90 international publications and has significantly contributed to teaching and advancing immunological research in Sri Lanka.

Research Student

Dr Kumudu Gunasekera, is the Parasitologist at the Anti Malaria Campaign and leads the national reference laboratory for malaria diagnosis. She has made a significant contribution to the quality assurance and quality control of malaria microscopy in Sri Lanka. Her PhD was completed with funds received from the National Science Foundation.

Research Student

Dr Priyani Dharmawardena, former Regional Malaria Officer, Western Province, Anti Malaria Campaign. She made a significant contribution towards developing malaria surveillance strategies. She completed her MPhil with funds received from the National Science Foundation.

Project Title : **Immunochemical characterization of Hymenopteran (*Apis dorsata* and *Vespa affinis*) insect venom and its cross reactivity with venom from European species**

Grant No. : **RG/2015/HS/02**

Outcome/s of the project:

This project addressed a critical diagnostic gap in Sri Lanka by developing laboratory-based assays for *Apis dorsata* and *Vespa affinis* venom allergies. Proteomic analysis revealed significant homology between *A. dorsata* and *A. mellifera* venoms, enabling the use of *A. mellifera* venom and its components for diagnosis and immunotherapy, findings cited in the 2023 EAACI Position Paper. A globally novel Passive Basophil Activation Test (pBAT) for venom allergy diagnosis was established, enabling cell-based diagnostics. Additionally, Sri Lanka's first venom collection device that ensures insect survival was developed. The project produced four SCI-indexed publications, nine conference presentations, and received three best oral presentation awards.

Principal Investigator

Dr Rajiva de Silva, MBBS, MD, is an immunologist and allergist with over 20 years' experience. A graduate from the University of Colombo and former Head of Immunology at the Medical Research Institute, his research focuses on insect venom hypersensitivity, primary immunodeficiency and vaccine allergy.

Co-Investigator

Prof. Sriyani Dias graduated with a BSc Special Degree in Zoology from the University of Kelaniya (1985) and joined its academic staff in 1986. She is a Senior Professor at the Department of Zoology and Environmental Management, holding MSc from AIT, Bangkok and PhD from Cardiff University, specializing in entomology and ecology.

Research Student

Dr Peshala Gunasekara obtained a BSc from the University of Colombo, an MSc with distinction in Cellular and Molecular Immunology, and a Ph.D. in Immunology from Institute of Biochemistry Molecular Biology and Biotechnology (IBMBB), University of Colombo. He currently works at the Sri Lanka Institute of Biotechnology (SLIBTEC).

CERTIFICATES OF COMMENDATION 2020

Project Title : **Evaluating the expression changes of non-coding RNA in Dengue Hemorrhagic Fever**

Grant No. : **RG/2015/BT/02**

Outcome/s of the project:

The two studies identified early biomarkers for predicting severe dengue (SD). The first revealed that miR-150 is significantly upregulated and its target gene EZH2 downregulated in SD patients within 3–4 days from fever onset, suggesting their utility as early prognostic markers. The second study showed that patients who later developed SD had significantly lower levels of iNOS expression, plasma nitric oxide (NO), and salivary/plasma oxidized LDL (oxLDL). These biomarkers, particularly iNOS and NO, demonstrated strong predictive value. Together, the findings highlighted potential molecular and oxidative stress markers for early SD detection, enabling timely clinical intervention and improved patient outcomes.

Principal Investigator

Snr Prof. Nimanthi Jayathilaka is a senior molecular biology and biochemistry researcher at the University of Kelaniya. She earned her BSc (Hons) in Cell and Molecular Biology from the University of Wisconsin–Superior (2003) and a PhD. Her work focuses on early biomarkers in infectious diseases like dengue, oxidative stress markers, biomarkers, and nutritional biochemistry.

Research Student

Ms Harsha Hapugaswatta is a PhD candidate in Molecular, Cellular, and Developmental Biology at the University of Kansas, working under Dr Mizuki Azuma. She earned a BS in Biochemistry (2015) and a MS in Molecular Biology (2018) from the University of Kelaniya.

Project Title : **Non-intrusive load monitoring for flexible demand estimation and management**

Grant No. : **RG/2016/EA & ICT/01**

Outcome/s of the project:

This project developed a robust real-time non-intrusive load monitoring (NILM) solution that accurately disaggregates appliance-level energy usage from low-sampling-rate power signals. It identifies active appliances, detects unknown loads and solar influx, and operates effectively under voltage fluctuations. The system supports real-time execution with minimal computational burden, enabling appliance usage forecasting and critical load detection. Validated on real households and public datasets, the solution integrates a smart meter interface with GUI for appliance training and monitoring. Published in top-tier journals, this research significantly advances demand-side management and energy efficiency in smart grid applications.

Principal Investigator

Prof. Roshan Godaliyadda, a senior IEEE member, is a Professor with the Dept. of Electrical & Electronic Engineering, University of Peradeniya. His research spans AI, signal/image processing, biomedical, spectral imaging, and smart grids. A PhD from NUS. He has published widely, won awards and is the Deputy Director of the Multidisciplinary AI Research Center (MARC).

Co-Investigator I

Snr Prof. Janaka Ekanayake, Senior Professor at University of Peradeniya, is a leading expert in renewable energy and smart grids. A Fellow of IEEE, IET, IESL, and Sri Lanka's National Academy of Sciences, he has published over 200 papers, co-authored 8 books, and received numerous awards, including CVCD and NSF honours.

Co-Investigator II

Prof. M. P. B. Ekanayake, from the Department of Electrical & Electronic Engineering, University of Peradeniya, is a Senior IEEE Member specializing in machine learning, signal/image processing, computer vision, and smart grids. With an H-index of 19 and 1493 citations. He is a Presidential Awardee and has won multiple international best paper awards.

Research Student I

Dr Shirantha Welikala is an Assistant Professor at Stevens Institute of Technology. Holding a PhD in Systems Engineering from Boston University, he researches control and optimization of networked multi-agent systems, including smart grids and cyber-physical systems. His prestigious honors include MED'22 Best Paper, CEB Gold Medal, and BU's Outstanding Dissertation Award.

Research Student II

Mr Neelanga Thelasingha is a machine learning research scientist at Meta Inc.. He holds a PhD and MS in Computer and Systems Engineering from Rensselaer Polytechnic Institute, NY, and BSc in Electrical and Electronic Engineering from the University of Peradeniya, Sri Lanka. His research lies in machine learning and optimal control.

NSF RESEARCH AWARDS 2021

Project Title : **Biodiversity and technological potential of micro-flora from selected Sri Lankan dairies**

Grant No. : **RG/2016/AG/02**

Outcome/s of the project:
This was the first metataxonomic study on Sri Lankan dairy microbiota. Study revealed the prevalence of less common dairy pathogens (*S. agalactiae*, *R. nasimurium*, *E. aerosaccus* and *S. saprophyticus*), less diverse and unbalanced microbiome of milk produced by local crossbreds, and also revealed complex relationships among the microbial communities of milk collected from different dairy farms, different climatic zones & different cattle breeds. Genotypic identification of beneficial isolates resulted in 96 NCBI GenBank submissions. Beneficial isolates obtained from the present study laid the foundation for establishing Sri Lanka's 1st dairy culture collection within ITI .We are also in the process of initiating a dairy laboratory to cater to the industry within FTS of ITI. This study produced 01 PhD several post graduates and many publications and won several local and foreign awards.

Principal Investigator

Prof. (Mrs) I. G. N. Hewajulige is a Research Professor at Industrial Technology Institute, Sri Lanka. She has graduated from University of Peradeniya in 1992 and completed her MPhil and PhD from University of Colombo in the field of Postharvest Biology and Technology and had many Post Doctoral Fellowships. Currently she is the Director General/CEO of Industrial Technology Institute.

Co-Investigator I

Prof. (Mrs) Chandrika M. Nanayakkara is a Professor at the Department of Plant Sciences, University of Colombo, Sri Lanka. She has obtained her Ph.D. in Agricultural Microbiology from Aberdeen University, Scotland, United Kingdom and M. Sc. in Applied Microbiology, University of Kelaniya, Sri Lanka. Her research interests are cataloguing fungal diversity of Sri Lanka using molecular techniques, characterization of microorganisms of dairy origin using molecular techniques, biological control of plant pathogens and antimicrobial compounds of natural origin

Research Student

Dr (Ms) D. U. Rajawardana is a Principal Research Scientist at Food Technology Section, Industrial Technology Institute, Sri Lanka and obtained her PhD in Food Microbiology, University of Colombo, Sri Lanka and MSc in Food and Nutrition from University of Peradeniya and BSc (Microbiology as the major) from University of Bangalore, India.

Project Title : **Proliferative, differentiation and toxicological effects of selected herbal / sponge extracts tested on in house established mesenchymal and haematopoietic stem cell lines**

Grant No. : **RG/2015/HS/01**

Outcome/s of the project:

From this study three non-toxic herbal preparations were identified with the potential to promote human stem cell proliferation, while another formulation showed cartilage regeneration and anti-obesity properties in vitro and ex vivo. The study also demonstrated the feasibility of using human stem cells as a cost-effective drug screening platform in Sri Lanka. Key outcomes include four local patents, a Presidential Award for scientific publication, two conference awards, multiple international publications and conference presentations. The research contributed to the awarding of a PhD degree to the student involved.

Principal Investigator

Prof. Emerita Preethi Udagama, a renowned researcher and alumna of the University of Colombo, complemented her academic training with postdoctoral work in Canada. A fellow of esteemed scientific bodies both locally and internationally, she retired in 2023 after 29 years of service as Chair Professor and Head of the Department of Zoology.

Co-Investigator

Prof. Sumedha Wijeratne, a pioneering clinical embryologist in Sri Lanka, served at the Faculty of Medicine, Colombo (1992–2018). Currently the Laboratory Director and Joint Managing Director at Vindana Hospital, she established key IVF labs, consults on SLAB accreditation, and holds numerous accolades recognizing her significant contributions to fertility

Co-Investigator II

Prof. Preethi Soysa served as a Professor in the Department of Biochemistry and Molecular Biology, University of Colombo. She introduced use of animal cell culture in cancer Research and stem cells in drug induced hepatotoxicity. Professor Soysa obtained International and National patents, and received President's and Senate Awards for Research.

Research Student

Dr Vindya Udalamaththa earned her BSc from the University of Pune, and MSc from the University of Colombo. She completed her PhD in 2019 under Prof. Preethi Udagama's supervision and later pursued postdoctoral work. She now serves as Programme Leader and Head of Research at Spectrum Institute of Science and Technology.

CERTIFICATES OF COMMENDATION 2021

Project Title : **Protective effects of selected medicinal plant extracts in rats with chemically induced nephropathy**

Grant No. : **RG/2016/HS/03**

Outcome/s of the project:

Efficacy and safety assessment of medicinal plant extracts is an essential threshold in the development of drug leads. The study focused on the investigation of nephroprotective effects, detailed mechanisms of action of selected medicinal plant extracts, and a polyherbal formulation in an animal model of nephrotoxicity. The patented polyherbal formulation developed in the study could be used in manufacturing new phytomedicines and nutraceuticals for the management of chronic kidney disease. The positive results of the study complement the efforts in reaching the national health needs of the general public, enhancing the quality of life of patients, and reducing the mortality of patients with kidney disease and the disability of the workforce in Sri Lanka.

Principal Investigator

Prof. Anoja P. Attanayake, Professor in Biochemistry, Department of Biochemistry, Faculty of Medicine, University of Ruhuna. She is a scientist in the field of Natural Products Chemistry and Nutritional Biochemistry with a special emphasis on diabetes mellitus and obesity. She is a winner of many national and international research awards, four patents, and a gold medalist in postgraduate research at the University of Ruhuna.

Co-Investigator I

Prof. Kamani A. P. W. Jayatilaka, Professor of Biochemistry, Department of Biochemistry, Faculty of Medicine, University of Ruhuna. Her main focus on research has been medicinal plants/ natural products as drug leads. She is a post-graduate supervisor and has received many research grants. Prof. Jayatilaka is a recipient of three President's Research awards, three patents, and a winner of several national awards.

Co-Investigator II

Prof. Lakmini K. B. Mudduwa, Senior Professor of Pathology and Specialist in Histopathology, Department of Pathology, Faculty of Medicine, University of Ruhuna. She has been a supervisor for five PhD research projects and many post MD (Histopathology) research projects while supervising many postgraduate trainees in histopathology attached to the Postgraduate Institute of Medicine. Her main research areas include breast cancer, thyroid cancer and immunohistochemistry.

Research Student

Dr Sachinthi Amarasiri, Senior Lecturer, Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna. Dr Amarasiri completed her PhD in Biochemistry in 2021. She has published 18 research papers with 11 articles in SCI/ SCIE journals. She is an inventor of a local patent and has received faculty, university, and national-level outstanding research awards.

CERTIFICATES OF COMMENDATION 2023

Project Title : **Genetic dissection of polyethylene degradation ability of *Perennipora sp.* isolated from decaying hard woods in Sri Lanka**

Grant No. : **RG/2019/BT/03**

Outcome/s of the project:

This research investigated fungal degradation of polyethylene, a major environmental pollutant. Fungi were isolated from decaying hardwoods in Sri Lanka's dry zone forests and identified using DNA-based methods. Eighty-five isolates were screened for laccase production, with top producers further tested for other polymer-degrading enzymes. Selected fungi were cultured with polyethylene sheets as the sole carbon source. Degradation was analyzed through scanning electron microscopy, weight loss, tensile strength reduction, and chemical changes. One isolate showed notable degradation, achieving 3% breakdown over 45 days. Future research will optimize laccase production, characterize enzymes, and compare them with laccases from other fungal species.

Principal Investigator

Prof. Renuka Attanayake is a professor and the Head of the Department of Plant and Molecular Biology, University of Kelaniya. She received her MSc and PhD degrees in Plant Pathology from Washington State University, WA, USA. She is interested in plant pathology, genomics studies, wood decay fungi and population genetics of plant pathogens. She is the team leader of the project which is co-funded by the International Center for Genetic Engineering and Biotechnology (ICGEB).

Co-Investigator

Dr Harshini Herath is a Senior Lecturer in the Department of Plant and Molecular Biology, University of Kelaniya. She completed her PhD degree in Plant Biotechnology at the State Agricultural Biotechnology Center, Murdoch University, Western Australia, with the sponsorship of Endeavour Postgraduate Awards, Australia.

Research Student

Ms Prameesha Perera was the Research assistant of the project. After completing of her MPhil degree from University of Kelaniya she joined PhD studies in Biochemistry at Miami University, USA, focusing on the structural dynamics of membrane proteins

Project Title : **Investigation of alternative stabilizer for soil and develop low cost, eco-friendly load bearing walling material**

Grant No. : **RG/2017/EA&ICT/02**

Outcome/s of the project:

This research was conducted with the objective of investing alternative stabilizers for soil, developing low cost, eco-friendly load bearing walling material and development of soil-based wall care putty. The project identified the best particle mix; soil and discovered stabilizer, sand, gravel, with water, for the proposed in situ walls, wattle, and daub load bearing walls. Furthermore soil-based wall finisher was developed from drinking water treatment plant sludge after analyzing physical and chemical properties of existing wall finishers and analyzing physical and chemical properties of drinking water treatment plant sludge.

Principal Investigator

Prof. Rangika Umesh Halwatura is a highly accomplished academic in Civil Engineering at the University of Moratuwa, where he earned a first-class BSc (Eng.) and a PhD in Structural and Building Services Engineering. He has authored over 225 publications on sustainable materials, green design, BIM, and construction management, and is internationally recognized for his research and inventions, receiving prestigious awards such as the CVCD "Most Outstanding Young Researcher," the 2016 Energy Globe Award (Sri Lanka), and the 2017 TWAS Young Scientist Award.

Research Student

Dr Himahansi Galkanda holds a PhD from the University of Moratuwa and a BSc in Green Technology (Hons) from the University of Ruhuna. As an accredited professional with the Green Building Council Sri Lanka (GBCSL) and a member of the Sri Lanka Association for the Advancement of Science (SLAAS). Her accolades include winning the Merrill J.Fernando Innovation Awards in 2021 and receiving the President's Award for Scientific Research in 2020. Additionally, she is a patent holder with four publications in refereed journals and nine conference publications.

SUSRED AWARDS

AWARDS FOR SUPERVISION OF PhD DEGREES

Thesis Title : **Application of Sri Lankan natural rubber in the field of power and energy**

Outcome/s of the project:

In this project, electrolytes were prepared using Sri Lankan natural rubber as the polymer and investigated for non-Li rechargeable cells and supercapacitors. All electrolytes exhibited ionic conductivities in the range of 10.4 – 10.3 Scm^{-1} at room temperature. As the first ever research project done to study the suitability of Sri Lankan natural rubber to serve in polymer electrolytes, promising results were obtained from the performance evaluation tests of devices adding value to one of the major export crops of the country. Six SCI journal publications were made with the outcomes.

Principal Supervisor

Senior Prof. (Mrs) G. A. K. S. Perera (BSc (Hons), MSc, PhD in Physics) is attached to Department of Electronics, Wayamba University of Sri Lanka. Her research expertise is on polymer electrolytes and their applications in energy storage devices. She holds Fellowships of IOP, UK and IPSL, SL.

Co - Supervisor

Senior Prof. K. P. Vidanapathirana (BSc (Hons), PhD in Physics) is attached to Department of Electronics, Wayamba University of Sri Lanka. His research expertise is mainly in the area of conducting polymers and their applications in energy storage devices. He is a Fellow of IOP, UK and IPSL, SL.

Research Student : Dr H. G. N. Rajapaksha

Thesis Title : Evaluation of potential health-enhancing properties of selected edible flowers available in Sri Lanka.

Outcome/s of the project:

Twenty selected edible flowers available in Sri Lanka were investigated for their bioactives and associated bioactivities as a prospective source for the food industry. Eight flowers were screened and the phenolic extraction parameters were optimized using the response surface methodology. The encouraging outcomes of the study reveal that the investigated edible flowers are rich sources of bioactives with significant bioactivities and can retain their bioactivities after digestion. Hence, consumption of these flowers might deliver beneficial health effects, thereby reducing the risk of chronic disease development. Based on this study, 10 full peer-reviewed research papers and 11 short communications were produced.

Principal Supervisor

Prof. K. K. D. S. Ranaweera is a renowned food scientist and academic, serving in key roles including Chairman of the Board of Governors, Institute of Food Science and Technology, Sri Lanka. With numerous national committee appointments and food technology patents, he contributes extensively to policy, research, consultancy, and sustainable development in Sri Lanka's food sector.

Co - Supervisor

Prof. K. D. P. P. Gunathilake earned BSc (Agric) and MSc degrees majoring in Food Science & Technology from the University of Peradeniya and MSc and PhD from Dalhousie University, Canada, and the University of Sri Jayewardenepura, respectively. He is a food science and technology researcher focusing on utilizing underutilized food crops.

Research Student : Dr J. Ganesamoorthy

Thesis Title : **Bionomics and control effects of *Anopheles stephensi* in Mannar and Jaffna districts of Sri Lanka**

Outcome/s of the project:

After being free of indigenous malaria since 2013, Sri Lanka was declared malaria-free by the World Health Organization in 2016. However, the threat of re-introduction and re-establishment of the disease remains, especially with the recent invasion of *Anopheles stephensi* in the North. This study provides the first detailed analysis of this vector in Sri Lanka, covering its biology, breeding preferences, tolerance to salinity and chlorine, and vectorial potential. It also assessed the use of larvivorous fish and insecticides (temephos, novaluron) for control. Findings are important for developing strategies to prevent malaria re-establishment, particularly in urban areas, where *A.stephensi*, which is resistant to many insecticides, poses a significant public health risk.

Principal Supervisor

Prof. Nayana Gunathilaka, is a Professor in the Department of Parasitology at the Faculty of Medicine, University of Kelaniya. Renowned for his research in vector-borne diseases, he has received multiple national awards, published extensively, and served in key advisory roles for the World Health Organization and the Ministry of Health, Sri Lanka. He has secured 3 national-level life-time awards in recognition of academic excellence and accomplishments.

Co - Supervisor I

Prof. W. Abeyewickreme is an Emeritus Professor at the Faculty of Medicine, University of Kelaniya. He is a Medical Entomologist and Parasitologist with over 45 years of experience in teaching and research. Two main achievements during his career were setting up the first government DNA laboratory in Sri Lanka and the Molecular Medicine Unit, and opening avenues for infectious disease research funding from the International Atomic Energy Agency (IAEA) and World Health Organization (WHO).

Co - Supervisor II

Prof. Rajitha Wickremesinghe is the Senior Professor and chair at the Department of Public Health, Faculty of Medicine, University of Kelaniya. He is an Epidemiologist and Biostatistician who has over 30 years of experience in teaching and research. He has many research interests and has published extensively. He has supervised many students at master's and doctoral levels.

Research Student : Dr P. J. Jude

Thesis Title : Inclusivity of marginalised communities during post-disaster phase in Sri Lanka

Outcome/s of the project:

The research found that enhancing inclusivity, transparency, and support in post-disaster contexts requires prioritising the needs of marginalised communities. Stakeholder analysis revealed unclear responsibilities and limited collaboration. Although Sri Lanka has policies addressing marginalised communities, gaps in implementation and awareness hinder their effectiveness. To address these issues, a framework with eight strategic goals, each with short-, medium-, and long-term targets, was developed. Equal prioritisation of these goals is essential for holistic post-disaster support. This framework offers valuable guidance for disaster management professionals, policymakers, and governments globally, advancing equity and social justice in disaster response and recovery efforts and beyond.

Principal Supervisor

Prof. Menaha Thayaparan, Professor in Building Economics in the Department of Building Economics at the University of Moratuwa, has a PhD in Construction and Property Management from University of Salford, UK. Her research interests include disaster resilience, vulnerable communities, higher education and technological advancement in the built environment.

Research Student : Dr A. P. K. D. Mendis

Thesis Title : **Antioxidant activity, phytochemical and proximate analysis of leaves of *Psidium guajava, Garcinia quaesita, and Eryngium foetidum***

Outcome/s of the project:

This study analyzed chemical profiles and antioxidant capabilities of leaf extracts and essential oils from seven guava varieties, two garcinia varieties (including *G. quaesita,* endemic), and long coriander. A total of sixty-eight constituents were identified in essential oils of guava varieties, with 28 of these components being reported for the first time, and 33 compounds from essential oils of two garcinia varieties were identified. Notably, strong antioxidants such as gallic acid, catechin, and quercetin were isolated and characterized from *G. quaesita* for the first time. Saponins from both *G. quaesita* and *P. guajava* were also reported for the first time in this study. The study resulted in 10 journal publications and 15 conference proceedings. This was funded by AHEAD-DOR project.

Principal Supervisor

Prof. Vajira P. Bulugahapitiya, is Senior Professor in Chemistry in the Department of Chemistry of University of Ruhuna. She earned PhD in Organic Chemistry from the University of Fribourg, Switzerland. Her research primarily focuses on organic synthesis and natural product chemistry, having authored 36 journal publications and over 120 conference proceedings with H-index of 11.

Co - Supervisor I

Dr H. C. Manawadu is a Senior Lecturer in Chemistry at the University of Ruhuna. She earned her PhD in Organic Chemistry from Kansas State University and her research has focused on the isolation and characterization of novel biologically active metabolites from medicinal plants and the synthesis of metal nanoparticles for advanced drug delivery systems targeting cancer therapies.

Co - Supervisor II

Dr Chinthaka Sanath Gangabadage is a Professor in Chemistry at University of Ruhuna and received his Bachelors' in 1997 and PhD in 2008. His teaching includes NMR Spectroscopy, Proteins, Analytical Chemistry. His research interests are on proteins, microplastics pollution and plant materials. He has published a number of articles in reputed journals.

Research Student : Dr S. Kokilananthan

Thesis Title : Production of mosquito repellents using lesser-known, under-utilized volatile oil producing plant species

Outcome/s of the project:

In this study, 127 underutilized volatile oil-bearing plant species with mosquito repellent potential were identified through expert and ayurvedic practitioner surveys. 25 top species were found across from a field survey in 480 rural households in six districts and twelve agro-ecological zones. A public-access database was developed with taxonomy, distribution, and oil-yielding parts is hosted at *www.tropicaltreesearch.com.* Product development was carried out for repellent sticks and sprays from five plant oils which proved effective and eco-friendly. A decision-support algorithm was also developed (GitHub: growmedicine) to assess cultivation willingness and inform policy decisions. Furthermore, Specimens of 28 species were preserved for future reference in herbarium.

Principal Supervisor

Prof. S. M. C. U. P. Subasinghe has over 30 years of experience in forestry and environmental science, specializing in forest management, forest certification, and not-wood forest products. A PhD graduate from Bangor, UK, he has led pioneering research on agarwood and sandalwood, authored 50+ publications, and held key leadership roles, including President of the Institute of Biology, Sri Lanka.

Co - Supervisor I

Prof. Menaka Hapugoda obtained her BSc special degree in zoology (2nd class upper) from USJP and her PhD in Medical Parasitology from UoK. She invented 2 recombinant proteins as diagnostic intermediates for dengue that resulted in 2 international patents.She serves as an Expert/Consultant in number of international and national bodies and as a member of several editorial boards. She has supervised many MPhil and PhD students and has an impressive publication record.

Co - Supervisor II

Dr Asitha Cooray obtained BSc (Hons) in Chemistry in 2005 from the University of Sri Jayewardenepura and PhD in 2013 from New Mexico Institute of Mining and Technology, USA. He joined the University of Sri Jayewardenepura in 2013 and is currently serving as a Senior Lecturer at the Department of Chemistry. His research interests include environmental chemistry, water chemistry and analytical chemistry.

Research Student : Dr K. D. Munugoda

Thesis Title : Surface modified graphene-based nanocomposite for selective molecular sieving and adsorption of aqueous ions

Outcome/s of the project:

The research successfully developed a novel modified graphene oxide-sand composite (M-GO/S) with enhanced adsorptive capabilities for water purification. M-GO/S demonstrated efficient removal of fluoride, calcium ions, and toxic metals (Pb, Cr, Cd, Ni), along with strong adsorption of organic pollutants such as MCPA and methylene blue. The composite's dual functionality combines filtration and adsorption, offering a comprehensive solution for water treatment. M-GO/S's scalable, binder-free synthesis and multi-contaminant removal potential makes it a promising, cost-effective candidate for practical water purification applications.

Principal Supervisor

Prof. Janitha A. Liyanage is a Senior Professor in Chemistry at University of Kelaniya, Fellow of the Royal Society of Chemistry (UK), Institute of Chemistry, Ceylon, Chartered Scientist and Chartered Chemist (UK), past General President of SLAAS, former Vice Chairperson of the UGC and Vice Chancellor, Gampaha Wickramarachchi University of Indigenous Medicine in Sri Lanka. Prof. Liyanage is a former Ambassador of Sri Lanka to the Russian Federation.

Co - Supervisor

Prof. A. R. Kumarasinghe obtained his PhD in Physics from University of Manchester, UK in 2004 and was a post-doctoral research associate before taking up a position as a Senior Lecturer in 2007 and joined SLINTEC in 2009. Since 2016, he is attached to the Department of Physics, University of Sri Jayewardenepura and currently is working as the Chair Professor.

Research Student : Dr W. P. R. T. Perera

Thesis Title : **Transcriptomics, microscopy and molecular interactions: a multifaceted exploration of floral and bark development of Ceylon cinnamon, *Cinnamomum verum* Blume (Sri Lanka)**

Outcome/s of the project:

This research project explored the floral and bark development of Ceylon cinnamon using transcriptomics, microscopy, and molecular interaction studies. The findings revealed key genetic pathways and cellular processes underlying bark formation and flower development, highlighting genes involved in secondary metabolite production, including those responsible for cinnamon's unique aroma and flavor. The study enhances understanding of cinnamon's developmental biology, offering potential applications for improving yield, quality, and stress resilience in cultivation, benefiting Sri Lanka's cinnamon industry and global spice markets. Identifying an efficient method for selfing to improve quality planting material production is beneficial for all the stakeholders in the Ceylon cinnamon value chain.

Principal Supervisor

Prof. Pradeepa Bandaranayake obtained her PhD from UC Davis with specialization in molecular biology, biochemistry and genomics with designated emphasis in biotechnology. In addition, she holds two MSc Degrees, MPhil, LLM and BSc. She serves as the Director of the Agricultural Biotechnology Centre and has co-authored over 40 SCI journal publications, and many other scientific publications.

Co - Supervisor

Prof. D. K. N. G. Pushpakumara boasts qualifications including a BSc (Peradeniya), MSc and PhD (Oxford). He has more than 30-years of experience in academia and research within agriculture. Presently, he is the Director at PGIA, specializing in research areas of tree diversity and improvement, agroforestry, climate change, and biodiversity, authoring over 100 publications.

Research Student : Dr B. M. Hathurusinghe

Thesis Title : **Synergistic effect of fluoride and hardness of drinking water on the chronic kidney disease of unknown aetiology (CKDu) in Sri Lanka**

Outcome/s of the project:

The research investigated the synergistic nephrotoxic effects of fluoride and water hardness in relation to CKDu in Sri Lanka through in-vitro (Vero-89 cell line) and in-vivo (Wistar rats) models. Results revealed significantly increased nephrotoxicity, particularly in fluoride-hardness combinations, aligning with high-prevalence CKDu regions. Elevated serum creatinine, KIM-1 levels, and renal histopathological changes supported these findings. Findings suggest that fluoride and hardness interactions may contribute to CKDu, suggesting a potential synergistic mechanism contributing to CKDu pathogenesis. The project led to 2 peer-reviewed journal articles, 2 book chapters, 15 conference abstracts, and received 2 best research presentation awards in international conferences.

Principal Supervisor

Snr Prof. Pathmalal M. Manage is the current Vice Chancellor of University of Sri Jayewardenepura. He is an expert in ecotoxicology, microbial ecology, water quality and environmental sciences. He has collaborated with Universities in the UK, USA, Japan, and China, securing several research grants and has successfully supervised 16 PhD and 13 MPhil candidates and authored over 150 publications indexed in SCI/SCIE/Scopus, along with more than 500 abstract publications, 6 books and 55 international book chapters.

Co - Supervisor

Prof. Emerita Kamani Wanigasuriya, is a distinguished physician and academic, served as Chair and Senior Professor in the Department of Medicine at the University of Sri Jayewardenepura. A graduate of the University of Peradeniya, she earned multiple postgraduate qualifications including MRCP (UK), MD, and MPhil. She has been honored with fellowships from prestigious institutions including the Royal College of Physicians (London).

Co - Supervisor II

Prof. Dulani Hasanthi Beneragama is a distinguished pathologist and an educator with over two decades of service. She has contributed immensely to medical education, research, and professional development and was appointed President of the College of Pathologists of Sri Lanka in 2021. She was awarded the prestigious Fellowship of the College of Pathologists of Sri Lanka in 2025 for her dedication, leadership and the contribution to the field of pathology.

Research Student : Dr K. T. Dilrukshi

Thesis Title : **Biotechnological prospects for industrial applications of extremophilic bacterial community in hot springs in Sri Lanka**

Outcome/s of the project:

This study characterized microbial communities in 4 Sri Lankan hot springs as a source of thermo-stable enzymes for industrial applications using high-throughput metagenomic sequencing and classical microbiological techniques. The study uncovered diverse thermophilic taxa dominated by Proteobacteria, Chloroflexi, and Firmicutes. Several enzyme-producing strains; Bacillus cereus VBE03 and Aeromonas caviae SCSB1 which displayed optimal activity between 45–60 °C were isolated. Functional gene profiling revealed key loci (e.g., treS, ftsZ, clpA) encoding industrially relevant enzymes. These findings provide a foundation for sustainable biocatalyst development. The study produced 2 journal publications, 24 abstracts, 4 book chapters, and was awarded the Best Research Presentation at two International Conferences.

Principal Supervisor

Snr Prof. Pathmalal M. Manage is the current Vice Chancellor of University of Sri Jayewardenepura. He is an expert in ecotoxicology, microbial ecology, water quality and environmental sciences. He has collaborated with Universities in the UK, USA, Japan, and China, securing several research grants and has successfully supervised 16 PhD and 13 MPhil candidates and authored over 150 publications indexed in SCI/SCIE/Scopus, along with more than 500 abstract publications, 6 books and 55

Co - Supervisor

Dr Kosala Sirisena is a Senior Lecturer in the Department of Environmental Technology, Faculty of Technology, University of Colombo. He obtained his PhD in Cell and Molecular Biosciences from Victoria University of Wellington, New Zealand. With over a decade of teaching and research experience, Dr. Sirisena has contributed to advancing knowledge in environmental microbiology, extremophiles, and sustainable biotechnological applications

Research Student : Dr H. D. Sadeepa

Thesis Title : **Biomarker-based screening for early detection of adolescent renal injury in dry climate zone communities in Sri Lanka in relation to environmental heat, fluoride, and body weight status**

Outcome/s of the project:

Breaking new ground in paediatric kidney health research in Sri Lanka, this pioneering study was the first to employ urinary biomarkers: KIM-1 and NGAL to assess renal health risk in children and adolescents before clinical symptoms emerged. By examining the combined effects of environmental heat exposure, fluoride levels, and body weight, the research unveiled critical insights into silent kidney stressors. The project led to six SCI-indexed publications and eight scientific presentations, and it was honored with two gold medals from the University of Ruhuna. This work sets a benchmark for innovative, child-centered child-focused renal health investigations.

Principal Supervisor

Snr Prof. P. Mangala C. S. De Silva, is Senior Professor of Zoology and specializes in environmental health and toxicology. His research focuses on environmental exposures, nephrotoxicants, and biomarker development to understand and mitigate the burden of chronic kidney disease, particularly among children and vulnerable communities affected by environmental stressors and climate change.

Co - Supervisor

Prof. Sudheera Jayasinghe is a clinical pharmacologist and toxicologist with over 15 years of academic and research excellence. Renowned for her work in neurotoxicology and CKDu, she has published extensively in peer-reviewed journals and received national and international awards for her scholarly contributions.

Co - Supervisor

Prof. Sisira Siribaddana, Chair of Medicine at Rajarata University, is known for research in kidney disease, tropical medicine, diabetes, bioethics, twin health, and ethics. He has led impactful studies with extensive international collaboration and recognition. His H index is 45, with over 200 publications and 7000 citations.

Co - Supervisor

Dr Chula Herath (MBBS, MD, FRCP, FCCP) worked as the first Consultant Nephrologist at Sri Jayewardenepura General Hospital (SJGH) for 30 years. Nephrology, Dialysis and Transplant unit of SJGH became one of the eminent post-graduate training centers in renal medicine during his time. He has trained over 40 Nephrologists who currently work in Sri Lanka and overseas.

Research Student : Dr T. D. K. S. C. Gunasekara

AWARDS FOR SUPERVISION OF MPhil DEGREES

Thesis Title : **Development of low-cost nanotechnology-based water filter using bio-based material to remove heavy metals and hardness in drinking water sources**

Outcome/s of the project:

There is a shortage of safe drinking water due to population increase and urbanization. Pollution from heavy metals and hard water are significant problems. In this work, amine-functionalized silica nanoparticles (AMS NPs) were incorporated into cellulose acetate (CA) electrospun nanofiber membranes to create an effective water purification technique. The optimized electrospun nanofiber membrane eliminated approximately half of the total hardness and heavy metals (As(V), Cd(II), and Pb(II)) from synthetic water in 8 hours under both static and dynamic circumstances. The results show that biodegradable AMS/CA nanofiber membranes have a great potential for heavy metal removal and water softening.

Principal Supervisor

Prof. Imalka Munaweera earned her BSc Hons degree in Chemistry from the University of Peradeniya and a PhD from the University of Texas, Dallas, USA. She completed her postdoctoral studies at the University of Texas Southwestern Medical School, USA. She is a multidisciplinary researcher with a focus on the development and application of advanced nanomaterials.

Co - Supervisor

Dr Laksiri Weerasinghe is currently a Senior Lecturer, Department of Chemistry, University of Sri Jayewardenepura. He obtained his BSc Hons degree in Chemistry from University of Colombo and a doctoral degree from Washington State University, USA. He completed his postdoctoral studies at University of Montreal, Canada.

Research Student : Ms S. H. Kumarage

Thesis Title : **Implications of heat-induced alterations on water repellency and aggregate stability of tropical and temperate soils**

Outcome/s of the project:

The study characterized pine, eucalyptus, cedar, and cypress forest soils for water repellency (SWR), water stable aggregates (WSA%) and aggregate floating, at different heating rates (slow/moderate/rapid), heating temperatures, and exposure durations. Heating temperature significantly influenced SWR and WSA%. WSA% and aggregate floating were similar, but SWR was different, in tropical and temperate soils. WSA% increased with heating up to ≤250°C and decreased with further heating beyond that. In both tropical and temperate soils, aggregates heated to <250°C floated in water, while those heated to ≥250°C did not. Results were published in 03 indexed journals (SCIE) and 05 communications.

Principal Supervisor

Prof. D. A. L. Leelamanie is a Senior Professor and the Chair of the Department of Soil Science, Faculty of Agriculture, University of Ruhuna. She completed her BSc in 2000 (Agriculture: Ruhuna), MSc in 2003 (Tropical soil management: Peradeniya), PhD in 2008 (Soil Physics: Tokyo). Her research interests are on soil water repellency, soil-water interactions, and soil structure.

Research Student : Ms H. T. M. Perera

Thesis Title : **Low cost and high efficient energy storage and conversion devices using activated carbon**

Outcome/s of the project:
The research successfully developed cost-effective, environmentally friendly supercapacitor energy storage devices using electronically conducting activated coconut shell charcoal electrodes. Multiple activation techniques enhanced the performance and charge-discharge cycle stability of the supercapacitors. The project produced 06 journal publications, 09 abstracts, and 03 conference presentations. A patent was submitted for the manufacturing method of these sustainable supercapacitor battery packs. The outcomes offer promising implications for renewable energy integration and rural electrification.

Principal Supervisor

Prof. G. R. A. Kumara is a Research Professor at NIFS, Sri Lanka, with a PhD in Engineering from Shizuoka University, Japan. He has received multiple national and international awards for contributions to solar energy and materials science, holds several patents, and has a h-index of 40.

Co - Supervisor

Prof. T. M. W. J. Bandara is a physicist specializing in solar energy materials, with a PhD from the University of Peradeniya. He has published over 80 papers and received multiple awards, including 09 Presidential Awards. His research includes photoelectrochemical cells, graphene, and sustainable energy technologies.

Research Student : Mr A. D. T. Medagedara

Thesis Title : **In vitro screening for abiotic stress tolerance in chili and beet varieties and utilizing the selects to identify a suitable crop model for microclimatic improvement in Kalpitiya cropping system**

Outcome/s of the project:

The research successfully identified chilli (Devnur Deluxe, Vijaya F1, MICH HY1) and beet (Red Ace, Maravilla Andina F1) varieties tolerant to heat, drought, and low nitrogen. Crop models integrating windbreakers, intercropping, and high-density planting improved microclimates, leading to enhanced yields, reduced temperatures, and increased relative humidity. These conditions minimized water loss and nitrate leaching, promoting efficient water and nutrient use. Remote sensing proved effective in assessing crop performance through NDVI analysis. Overall, the integrated approach demonstrated practical potential for improving environmental and socioeconomic sustainability in Kalpitiya's intensive vegetable production systems while protecting groundwater from agrochemical contamination.

Principal Supervisor

Prof. Prasanthi Perera, a Plant Science PhD and postdoctoral fellow at CIAT, Colombia, serves at the Wayamba University of Sri Lanka. With over 23 years of experience, she excels in plant tissue culture, plant breeding, and crop production, publishing extensively and contributing as an editor and reviewer in scientific journals.

Co - Supervisor

Dr Surantha Salgadoe, a Senior Lecturer at Wayamba University of Sri Lanka, is an experienced researcher in agricultural remote sensing. With global exposure in Australia and local exposure Sri Lanka, he specializes in crop monitoring, yield forecasting, and precision agriculture. He earned his PhD from the University of New England, Australia.

Research Student : Mr A. S. Jathunarachchi

Thesis Title : **Physical and biological activities of green synthesized Silver and Zinc nanoparticles/ nanocomposites utilizing selected agro-waste**

Outcome/s of the project:

This research explored physical and biological activities of green-synthesized silver (Ag), zinc oxide (ZnO) nanoparticles (NPs), and $Ag/Ag_2O/ZnO$ nanocomposites (NCs), using Murusi and Kew pineapples (peels, crowns, leaves), Suprema F1 pumpkin (seeds, peels, leaves), and palmyra (pulp, sprouts). A cosmeceutical topical cream was formulated using sprout-mediated NCs, owing to potent biological properties. Murusi leaves were utilized to synthesize cellulose nanocrystals in a sustainable, eco-friendly manner and when integrated with Murusi crown-mediated NCs showed promising potential for wastewater treatment by effectively filtering selected waterborne pathogens.

Principal Supervisor

Prof. G. Thiripuranathar is a Professor at the College of Chemical Sciences, Institute of Chemistry Ceylon. She obtained her PhD at the Heriot-Watt University, Scotland, UK. Her research focuses on multidisciplinary areas within the field of Chemistry.

Co - Supervisor

Snr Prof. Sagarika Ekanayake, is the Chair Professor of Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura. Her research interests include a wide range of areas covering chemistry and biochemistry including food and nutrition. She has trained many postgraduate students and is a recipient of many research awards and honours.

Research Student : Ms A. M. S. H. Attanayake

Thesis Title : **Design and implementation of novel self-powered, battery-free devices using simultaneous wireless energy harvesting and data transmitting through single frequency channel**

Outcome/s of the project:

A novel, self-powered, and battery-free wireless device using a unique technique for simultaneous wireless energy harvesting and data transmission through a single frequency channel was developed. The prototype consists of battery-free wireless nodes and a gateway, which are coupled through a single-frequency wireless channel. It also consists of a unique firmware design allowing autonomous operation without reliance on any external power units. The experimental results indicate that the prototype achieves ultra-low power operation and long-distance wireless communication.

Principal Supervisor

Prof. A. L. A. K. Ranaweera, Department of Physics and Electronics, University of Kelaniya, obtained PhD in Electronics and Radio Engineering, Kyung Hee University, South Korea. He holds titles MIEEE and MURSI. He leads the Electronics Design and Innovation Centre which is dedicated for developing electronic products with commercial potential.

Co - Supervisor I

Prof. K. M. D. C. Jayathilaka, Department of Physics and Electronics, University of Kelaniya, obtained PhD in Solid State Physics, Colombo University. His current focus is on photovoltaic and gas-sensing semiconductor thin films. His work so far has contributed to 35 publications.

Co - Supervisor II

Dr J. A. Seneviratne, Senior Lecturer, Department of Physics and Electronics, University of Kelaniya, obtained PhD from Mississippi State University. Currently, leads the Entrepreneurship and Leadership Division of the Electronics Design and Innovation Centre and the Equipment Repair Unit, which are under the Department of Physics and Electronics, University of Kelaniya.

Research Student : Mr L. D. P. S. Jayasekara

Thesis Title : Organo functionalized biochar for the detoxification and removal of hexavalent chromium in aqueous media

Outcome/s of the project:

The research project successfully developed organo-functionalized biochar from waste biomass for the efficient removal of hexavalent chromium [Cr(VI)] from aqueous media. The engineered biochar exhibited high sorption capacity, enabling rapid and effective detoxification of this toxic, carcinogenic pollutant. This innovation contributes to public health protection by reducing Cr(VI) exposure in contaminated water systems. Additionally, the project supports sustainable waste management by converting agricultural or industrial biomass into value-added sorbents. The findings advance Sri Lanka's environmental protection goals and provide a scalable, eco-friendly solution for heavy metal remediation, aligning with global priorities for pollution control and resource circularity.

Principal Supervisor

Dr Anushka Upamali Rajapaksha is a Senior Lecurer and Director of the Ecosphere Resilience Research Centre at the University of Sri Jayewardenepura. She has an excellent background in chemistry, specially focusing on chemical kinetics, sorption and environmental chemistry. She has received multiple prestigious awards and editorial appointments and holds an h-index of 40 with over 13000 citations.

Co - Supervisor

Prof. Meththika Vithanage is a leading environmental scientist, and a Professor of Water Quality at GEUS, Denmark. Former Founding Director of the Ecosphere Resilience Research Center, she holds an h-index of 92 with over 31,100 citations and has secured research grants exceeding LKR 500 million for Sri Lanka.

Research Student : Ms E. M. A. S. Ekanayake

Thesis Title : **Microplastics- bound transport of pharmaceuticals, personal care products (PPCPs) and toxic trace metals in water**

Outcome/s of the project:

The research addressed critical knowledge gaps regarding the capacity of pristine and aged polyethylene microplastics to transport selected PPCPs (Caffeine and Ciprofloxacin) and toxic metals (Lead and Chromium) in aquatic environments. The factors influencing the sorption and transport of the above-mentioned toxic substances were explored including how equilibrium solid-water distribution coefficients affect their binding to different types of microplastics, and the varying bioavailability and risks associated with PPCPs, and toxic metals bound to microplastics. By filling these research gaps, the study will attract both national and international attention, fostering further research on microplastics as vectors for contaminant transport in the environment.

Principal Supervisor

Dr Hasintha Wijesekara, is a Senior Lecturer at the Department of Natural Resources, Sabaragamuwa University. He is an Environmentalist with research interests of environmental contaminant identification, quantification and remediation, thereby creating a healthy planet for all. He holds an h-index of 31 with over 5,300 citations.

Co - Supervisor I

Prof. Meththika Vithanage is a leading environmental scientist, and a Professor of Water Quality at GEUS, Denmark. Former Founding Director of the Ecosphere Resilience Research Center, she holds an h-index of 92 with over 31,100 citations and has secured research grants exceeding LKR 500 million for Sri Lanka.

Co - Supervisor II

Dr Anushka Upamali Rajapaksha is a Senior Lecturer and Director of the Ecosphere Resilience Research Centre at the University of Sri Jayewardenepura. She has an excellent background in chemistry, specially focusing on chemical kinetics, sorption and environmental chemistry. She has received multiple prestigious awards and editorial appointments and holds an h-index of 40 with over 13000 citations.

Co - Supervisor III

Prof. Nadeeshani Nanayakkara obtained BSc (Eng.) with First Class Honors from University of Peradeniya and PhD from the National University of Singapore. Currently she works as a Professor in Civil Engineering, Department of Civil Engineering, Faculty of Engineering, University of Peradeniya.

Co - Supervisor IV

Dr Sasimali Soysa earned her PhD in Biochemistry from Suranaree University of Technology, conducting part of her research in Germany under a DAAD scholarship. A senior faculty member at Sabaragamuwa University. Her research focuses on biosensors, enzyme-based biocatalysis, and bioelectrochemical systems. She is currently a Visiting Scholar at VISTEC, Thailand.

Research Student : Ms A. A. M. Sewwandi

Thesis Title : **Utility of urinary Cystain-C as a screening tool in detecting renal injury among adolescents in the regions of CKDu in Sri Lanka**

Outcome/s of the project:

In the present study, the reference intervals for urinary Cystatin (ng/mg.Cr) for boys 45.94 – 64.44 and girls 53.58 – 69.97 were established while adding significant credence towards the integration of uCys-C as a renal biomarker in clinical practice. Furthermore, significantly higher likelihood of fluoride exposure within adolescent communities residing in the dry climatic zone was identified, compared to the wet and intermediate climatic zones. Also, a notably high incidence of family history of CKD/CKDu in participants from farming families compared to the non-farming families must be highlighted as critical concerns that require prompt interventions through longitudinal clinical and observational studies.

Principal Supervisor

Snr Prof. P. Mangala C. S. De Silva, Senior Professor of Zoology, specializes in environmental health and toxicology. His research focuses on environmental exposures, nephrotoxicants, and biomarker development to understand and mitigate the burden of chronic kidney disease, particularly among children and vulnerable communities affected by environmental stressors and climate change.

Co - Supervisor I

Prof. Sudheera Jayasinghe is a clinical pharmacologist and toxicologist with over 15 years of academic and research excellence. Renowned for her work in neurotoxicology and CKDu, she has published extensively in peer-reviewed journals and received national and international awards for her scholarly contributions.

Co - Supervisor II

Dr Chula Herath (MBBS, MD, FRCP, FCCP) worked as the first Consultant Nephrologist at Sri Jayewardenepura General Hospital (SJGH) for 30 years. Nephrology, Dialysis and Transplant unit of SJGH became one of the eminent post-graduate training centers in renal medicine during his time. He has trained over 40 Nephrologists who currently work in Sri Lanka and overseas.

Co - Supervisor III

Prof. Eranga Wijewickrama is a Senior Lecturer in the Department of Clinical Medicine, Faculty of Medicine, University of Colombo. He graduated from the University of Colombo in 2002. His research interests include venom induced acute kidney injury, thrombotic microangiopathy and chronic kidney disease of uncertain aetiology (CKDu) in Sri Lanka.

Research Student : Ms P. M. M. A. Sandamini

Thesis Title : **Fabrication and characterization of perovskite thin film field effect transistors**

Outcome/s of the project:

This work reports the successful fabrication of the first air-processed, lead-free, all-inorganic double perovskite $Cs_2AgBiBr_6$ thin film FETs, showcasing significantly enhanced carrier mobility compared to earlier studies. Furthermore, $MAPbI_3$-based FETs were also created, and their transfer output characteristics were investigated to assess their capacity for optical gating. With source-drain currents ranging from 1.7 μA to nearly 7 μA as the light intensity changed from 20 $mWcm^{-2}$ to 100 $mWcm^{-2}$. The high impact of this research was acknowledged through its selection as a top 50 downloaded paper in Scientific Reports journal.

Principal Supervisor

Prof. M. Thanihaichelvan BEng (Hons)(IND), MSc (UK), PhD (NZ), CEng (UK), SMIEEE, is a Professor of Electronics in the Department of Physics, University of Jaffna. With a strong research background in nanoelectronic devices and their biosensor applications, his contribution to the field of nanobiosensors is commendable, evidenced by over 30 journal articles and 2 patents.

Co - Supervisor

Prof. P. Ravirajan, BSc Hons (Physics) (Jaffna), MSc (Peradeniya), DIC, PhD (London), is a Senior Professor of Physics and a Fellow of the National Academy of Sciences of Sri Lanka. He has successfully completed seven research projects as Principal Investigator, securing over LKR 550 million in funding from national and international agencies, which supported the training of more than 15 MPhil/PhD candidates and establishments of two laboratories.

Research Student : Mr G. Abiram

NSF HCP AWARDS 2025

Category	:	**JNSF (Foreign)**
Title of the Article	:	**Implementation of data cache block (DCB) in shared processor using field-programmable gate array (FPGA)**
Name of the Journal	:	**Journal of National Science Foundation Volume- 48 (4)**

First Author

Dr R. Karthick (Karthick Ramachandran) is a Professor in the Department of CSE at KLN College of Engineering in India with a PhD from Bharath University. He brings over a decade of academic experience in Biomedical Engineering, CMOS, VLSI and testing, contributing extensively to research and higher education.

Co- Author

Dr P. Meenalochini is an Associate Professor in the Department of EEE at Sethu Institute of Technology, Tamil Nadu. She holds a Ph.D. from Anna University. Her research focuses on inverters and converters in power systems, contributing significantly to the advancements in power electronics and energy-efficient technologies.

Category	:	**JNSF (Local)**
Title of the Article	:	**Comparison of inter-varietal differences in chemical composition and nutrition properties of coconut testa flour**
Name of the Journal	:	**Journal of National Science Foundation Volume- 47 (3)**

First Author

Sanjila Marasinghe is currently reading for her PhD at Queensland University of Technology in Australia. She earned her BSc (special) degree in Food Science and Technology from Sabaragamuwa University of Sri Lanka and MSc in Clinical Biochemistry from Postgraduate Institute of Science, University of Peradeniya.

Co- Author I

Prof. Nazrim Marikkar, currently works as the Head of the Food Chemistry Programme at the National Institute of Fundamental Studies, Kandy. He earned his BSc (Hons) Degree in Chemistry from the University of Colombo in 1995 and obtained his PhD Degree in Food Biochemistry from the University Putra Malaysia in 2004.

Co- Author II

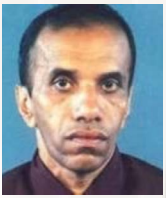
Dr Chandi Yalegama, currently works as the Deputy Director Research at the Coconut Research Institute, Lunuwila. She obtained BSc (Special) Degree in Chemistry from the University of Sri Jayawardenepura, MSc (Agri) in Food Science from Maharastra Agriculture University of India and PhD from Postgraduate Institute of Science, University of Peradeniya.

Co- Author III

Prof. Swarna Wimalasiri served as an academic staff member in the Department of Food Science and Technology, University of Peradeniya and is now retired. She obtained her BSc (Hons) degree in Chemistry and PhD in Carbohydrate Chemistry from University of Peradeniya. At present she serves as a visiting lecturer to the Postgraduate Institute of Agriculture.

Co- Author IV

Prof. Gamini Seneviratne, currently works as a Senior Research Professor and the Head of the Microbial Biotechnology Programme at the National Institute of Fundamental Studies, Kandy. He earned his BSc and PhD (Botany/Soil Biology) degrees from the University of Peradeniya in 1984 and 1993, respectively.



Prof. Rohan Weerasooriya is presently a Research Professor at the National Institute of Fundamental Studies, Kandy and Distinguished Professor at the Hefei University, China, conducting fundamental research on drinking water quality modeling and sensor developments. He also served as a DAAD (Guest Professor, Germany), Fulbright (Hayes Senior Scholar, USA).

Prof. Ruvini Liyanage currently works as an Associate Research Professor in the Nutritional Biochemistry Program at the National Institute of Fundamental Studies, Kandy. She earned her BSc (Hons) degree in Agriculture from the University of Peradeniya, MSc and PhD in Animal and Food Hygiene from Obihiro University of Agriculture and Veterinary Medicine, Japan.

Category	:	**SLJSS (Foreign)**
Title of the Article	:	**Strangers at home: narratives of northern Muslim returnees in post-war Sri Lanka**
Name of the Journal	:	**Sri Lanka Journal of Social Sciences Volume- 42 (2)**

First Author

Dr Diotima Chattoraj is a Research Fellow at NTU Singapore and Adjunct Research Fellow at James Cook University. A qualitative researcher, she focuses on Asian migration, international relations, and media studies. She is the Deputy Editor of *South Asia Research* and a regular reviewer for several peer reviewed journals.

Co- Author

Eva Gerharz is a Professor of Sociology. Speaker of the research cluster Shaping Future Society and Head of the Fulda Graduate Centre of Social Sciences. Her areas of interest include development and reconstruction, peace and conflict, migration, social movements, and indigenous activism in South Asia. She has authored and edited several books and published widely in international journals.

Category	:	**SLJSS (Local)**
Title of the Article	:	**Between the sea and the land: small-scale fishers and multiple vulnerabilities in Sri Lanka**
Name of the Journal	:	**Sri Lanka Journal of Social Sciences Volume- 43 (1)**

Author

Fazeeha Azmi, M.I. is a Professor attached to the Department of Geography, University of Peradeniya and a research associate at the Thompson Rivers University, British Columbia, Canada. She is a Human Geographer and her research interests include gender issues, migration, post-war issues, poverty and livelihood changes, fisheries, and political ecology.