Third International Conference on Frontiers in Molecular Life Sciences

Multidisciplinary Research For Sustainable Development in the Post Genomic Era

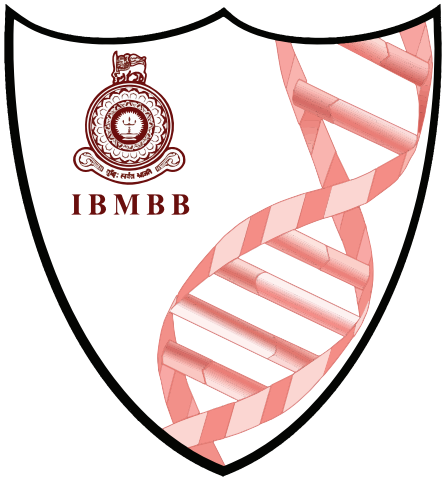
06th & 07th April 2022 — Colombo, Sri Lanka

PROGRAMME AND ABSTRACT BOOK

IBMBB

Third International Conference on Frontiers in Molecular Life Sciences

Institute of Biochemistry, Molecular Biology and Biotechnology - University of Colombo



PP 15: Comparison of rat immune responses to two pathogenic *Leptospira* serovars prevalent in Sri Lanka
Gangani PD, Anuradha WGK, Fernando N, Karunanayake L , Rajapakse S, Premawansa, S Handunnetti SM

PP 16: Effect of aqueous extracts of cinnamon bark on hyperglycaemia in diabetes induced Wistar rat models
Wijenyaka GMUD, Bulugahapitiya VP, Jayasinghe SS

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PP 18: Protein-ligand docking for the identification of therapeutic ligands against the Nipah virus attachment glycoprotein using AutoDock
Ekneligoda T, Perera O, Mudalige H

PP 19: Scientific investigation on Sri Lankan polyherbal drug "Neelagiri Padmana" for its antioxidant activity, polyphenol content and GC-MS analysis
Madhushanka LWN, Lakshman GVCP, Ratnayake RMCG, Ariyawansha HA, Wageesha NDA

PP 20: A molecular docking study revealed natural benzophenones and xanthones from *Garcinia zeylanica* as Wnt and Hedgehog pathway inhibitors in breast cancer stem cells
Rajagopalan U, Samarakoon SR, Saliu TP, Tennekoon KH, Senathilake K, de Silva ED

PP 21: Effect of *Munronia pinnata* on function of DENV-3 and interaction of DENV3 and endothelial cells
Munezero PC, Handunnetti SM, Fernando NTRG, Ranaweera LR, and Hapuarachchi SD

PP 22: Phytochemicals Coated Silver Nanoparticles as Potential Vehicles for the Delivery of Plant Natural Products
Kalansuriya P, Lokunarangoda AJ

PP 23: Antioxidant, antibacterial, and antifungal activities of flowers of *Hibiscus spp*
Rajapaksha RMK, Edirisinghe EMRKB

PP 21 (Abstract # 55)

Effect of *Munronia pinnata* on function a changes of endothelial cells interacted with DENV-3

Munezero PC[1], Handunnetti SM[1], Fernando NTRG[1], Ranaweera LR[1], and Hapuarachchi SD[2]

[1]Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo, Sri Lanka
[2]Institute of Indigenous Medicine, University of Colombo, Sri Lanka

Infection of endothelial cells (ECs) and their dysfunction has been implicated in the immunopathogenesis of the dengue virus (DENV), which lead to increased severity. Therefore, the therapeutic targeting of the endothelium may be an excellent treatment strategy. *Munronia pinnata* is a rare medicinal plant that is commonly used to treat fever in traditional systems of medicine in Sri Lanka. The objective of this study was to investigate the effect of the aqueous plant extract (APE) of *M. pinnata* on the interaction between DENV-3 and ECs. The effect of DENV-3 on the metabolic activity of ECs was evaluated by using MTT. The effect of APE of *M. pinnata* on the interaction between DENV-3 and ECs was assessed in three different ways to determine the potential of *M. pinnata* to protect the endothelial cells during a dengue infection; i) pre-treatment of DENV-3 with APE prior to exposure, ii) sequential treatment of ECs with DENV-3 followed by APE treatment and iii) sequential treatment of ECs with APE followed by DENV-3. A 49.8% reduction of EC viability was recorded following interaction with DENV-3 as opposed to that in the absence of DENV-3 ($p<0.001$). However, significant protection of ECs was observed at almost all concentrations of APE in our treatment strategies. Interestingly, increased protection was observed during the pre-treatment of DENV-3 with APE prior to its interaction with ECs (lowest $p=0.0003$), and the highest protection of EC was observed at 15.6 and 31.3 µg/mL of APE ($p<0.0001$). This study suggests that the APE of *M. pinnata* exhibits an antiviral effect against DENV-3 by protecting the metabolic activity of ECs. Further studies are needed to understand the underlying mechanisms of the direct inhibitory activity of *M. pinnata* against DENVs, and to characterize the active compounds.

Keywords: *Munronia pinnata*, dengue virus, endothelial cells, immunopathogenesis, cell proliferation assays

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PP 22 (Abstract # 67)

Phytochemicals Coated Silver Nanoparticles as Potential Vehicles for the Delivery of Plant Natural Products

Kalansuriya P[1], Lokunarangoda AJ[1]

[1]Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka

Most plant extracts used in traditional medicines possess inherent antimicrobial activity, and nanosizing them or incorporating them into nanostructures may further enhance their efficacy. In this study, silver nanoparticles (AgNPs) were synthesized using aqueous extracts of plants used in ayurvedic medicine to treat wounds: *Lannea coromandelica* (Indian ash tree, hik, Family: Anacardiaceae) and *Pothos scandens* (climbing aroid, pota wel, Family: Araceae). Stem bark of *L. coromandelica*, leaves and stems of *P. scandens* were dried and pulverized. *L. coromandelica* and *P. scandens* (10 g) were sonicated (44 kHz, 40 ºC, 30 min) separately, in H_2O. Different concentrations of the aqueous extracts (2.5, 5, 7.5 mg/mL) were each individually mixed with aqueous $AgNO_3$ to synthesize LC-AgNPs and PS-AgNPs. Several different conditions i.e., homogenization or magnetic stirring with exposure to UV light/sunlight/dark were employed and yields were optimized based on UV spectral data. The reduction of $AgNO_3$ by the phytochemicals were analyzed using UV−Vis spectra in the range of 200−600 nm. AgNPs were characterized using particle size analyzer and atomic force microscopy (AFM). The observed Z-average particle diameter was 200.2±1.0 nm with a polydispersity index (PDI) of 0.435 for LC-AgNPs with a zeta potential at –20.3±1.2 mV. The PS-AgNPs showed the Z-average particle diameter of 216.8±0.7 nm with PDI of 0.401 and a zeta potential at –20.2±0.7 mV. The Z-average particle diameter, PDI and zeta potential of uncoated silver nanoparticles (U-AgNPs) were 128.8±0.8 nm, 0.474 and –17.6±1.2 mV respectively. AFM revealed the presence of spherical LC-AgNPs and PS-AgNPs of the size ranges 100–300 nm and 200–400 nm respectively. The AFM images on U-AgNPs revealed the presence spherical nanoparticles in the 200–400 nm. This study revealed two novel methods of phytochemicals-assisted synthesis of AgNPs.

Keywords: natural products, medicinal plants, phytochemicals, nanoparticles

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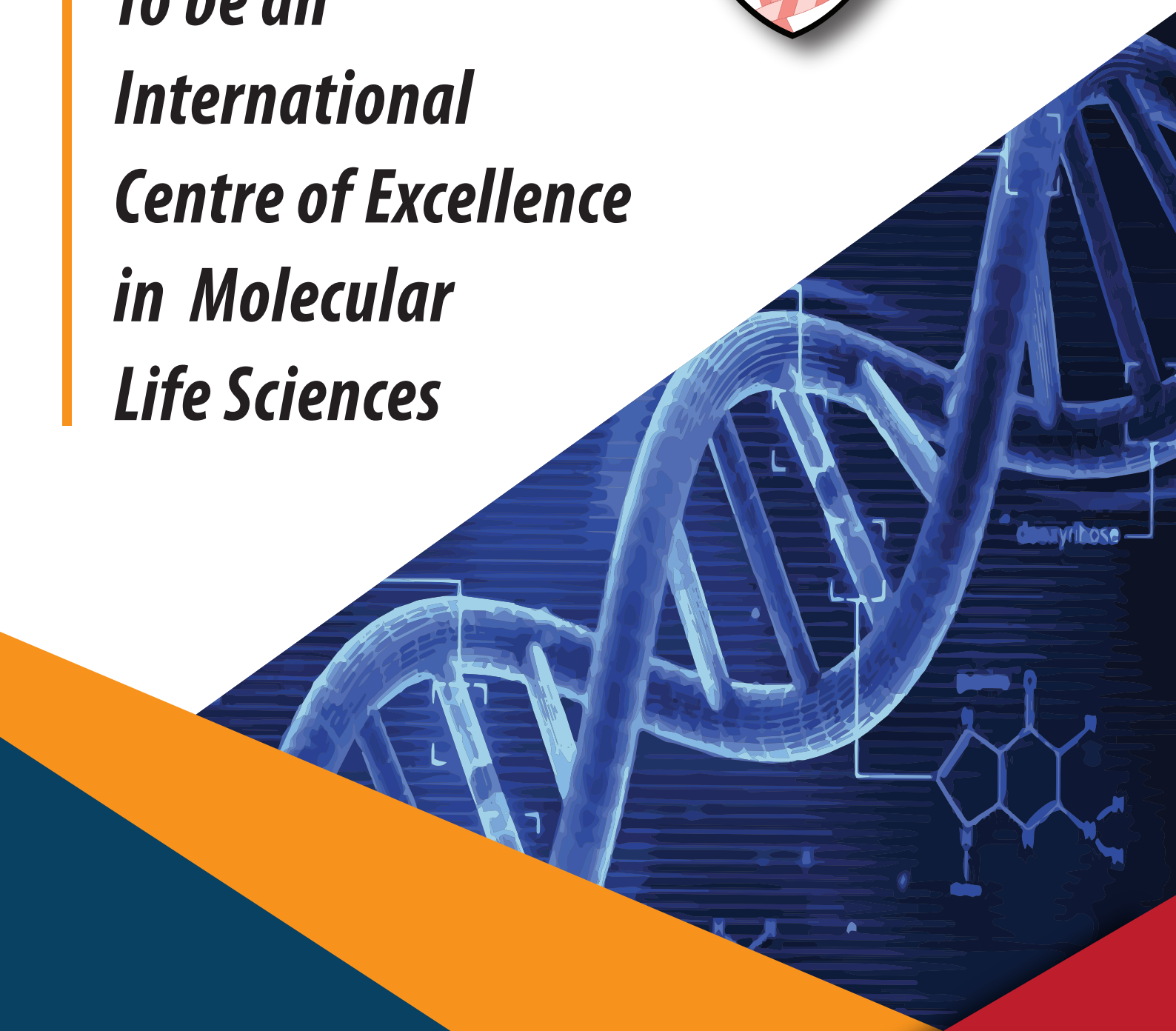
Vision

To be an International Centre of Excellence in Molecular Life Sciences



Institute of Biochemistry, Molecular Biology and Biotechnology
No: 90, Cumaratunga Munidasa Mawatha, Colombo 3, Sri Lanka.

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