

Mr. RAMESAN CKV

Title of the PhD Thesis: Studies on carbapenem resistance and development of peptide drug leads against Enterobacteria.

Multidrug-resistant gram-negative bacteria pose the biggest challenge to healthcare due to the lack of effective therapeutic options. Among the antibiotics, Carbapenems are most commonly used. Infections due to carbapenem resistant Gram-negative bacteria are burdened by high mortality and represent an urgent threat to address. The emergence of the enzyme carbapenemases in *Enterobacteriaceae* is a growing public health problem worldwide because of their high prevalence, wide range of clinical infections, multidrug resistance and rapid dissemination of plasmid-mediated resistance genes from *Enterobacteriaceae* to other organisms. The study aims screening of Carbapenem Resistant Enterobacteria (CRE), characterization of the isolates and carbapenemase encoding genes among the isolates, Screening of peptide(s) against CRE and its characterization and development of peptide drug leads against CRE

Status: Ongoing



Mrs. SILPA K

Title of the PhD Thesis: Studies on antimicrobial peptides from fishes.

Fish are a great source of peptides, as they express all of the major classes of AMPs, including Piscidins. As with other species, the fish peptides exhibit broad-spectrum antimicrobial activity, killing both fish and human pathogens. Marine fishes possess antimicrobial peptides as a part of their defence system. A number of α -helical Antimicrobial Peptides have been isolated from different species of fishes. Bioactive peptides derived from fish muscle proteins have shown various biological activities including antihypertensive, antibacterial, anticoagulant, anti-inflammatory and antioxidant activities, and hence they are potential material for biomedical and food industries. In this context novel peptides from fishes showing antimicrobial properties have been taken as the topic of study.

Status: Ongoing



Mrs. SOONU VK

Title of the PhD Thesis: Study the synergistic effect of statin / biguanide along with conventional chemotherapeutic drugs in obesity associated aggressive breast cancer cells

Breast cancer cases are the most frequent carcinoma in females and second most common cause of cancer related mortality in women. Obesity of an individual is associated with increased adipogenesis and enlarged with molecularly altered adipocytes. Obesity is an independent prognostic factor for developing distant metastases and poor prognosis in breast cancer patients. Statins are 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibitors. The biguanides are a family of drugs and in the liver, they cause energetic stress, resulting in inhibition of hepatic gluconeogenesis and reduction in the hyperglycaemia. Both of the drug categories can inhibit adipocyte differentiation. By using drugs which can block adipose differentiation and inflammatory cytokine productions could be used to block the adipose secretions from mammary cells and thus can inhibit the aggressiveness of obese breast cancer cells.

Status: Ongoing



Ms. VARSHA K

Title of the PhD Thesis: Isolation, purification and characterization of novel antimicrobial peptide(s) from plant source(s)

Emergence of drug resistant microorganisms are threat to humans. Nowadays researches are focusing on new therapeutic agents to overcome this problem. Antimicrobial peptides (AMPs) gaining attention due to its potent antimicrobial activity against pathogenic organisms. AMPs are ambiguous in nature and very fewer were reported in plants sources. As the AMPs have several targets and several modes of actions, developing resistance against such antimicrobial peptides are apparently more difficult to pathogenic organism. The present work is focused on isolation and purification of novel antimicrobial peptide from plant source(s) and development of drug leads.

Status: Ongoing



Mr. PRAJOSH P

Title of the PhD Thesis: Studies on Antimicrobial Lipopeptide(s) of *Bacillus* sp.

Antimicrobial peptides constitute a structurally diverse group of metabolites produced by various bacterial and fungal genera. It can act as bio-control agents because of their property of inhibition of growth of a variety of microorganisms. The study mainly focused on the isolation and characterization of novel antimicrobial peptides from *Bacillus* sp isolated from fishes and assessment of antimicrobial peptides / lipopeptides thus obtained for their therapeutic opportunities and in combinatorial medicines.

Status: Ongoing



Dr. ZEPHYR C KOTTAYIL

Title of the PhD Thesis: Studies on antibodies in response to Methicillin Resistant *S. aureus* (MRSA) antigens for vaccine development.

Staphylococcus aureus is responsible for serious infections in humans. Increasing antibiotic resistance and difficulty to treat staphylococcal infections demands alternative treatment strategies such as vaccines and therapeutic immunoglobulins. Staphylococcal Protein A (SpA) is a key virulence factor involved in pathogenesis and immune evasion of this bacterium. This study evaluated the efficacy of recombinant SpA-B and SpA-C domains as vaccine candidates against Methicillin Resistant *Staphylococcus aureus* USA300 infection in Balb/c mice. Vaccination protected mice from lethal infection by demonstrating increased survival rate, reduced bacterial load in internal organs and by inducing vaccine specific IgG, IgG1 and IgG2a antibodies. The study also revealed opsonic properties of anti-SpA domain specific antibodies involved in opsonophagocytic killing of *S. aureus* mediated by macrophages.

Status: PhD Awarded, 2020

Dr. SHABEER ALI H

Title of the PhD Thesis: Antimicrobial Properties and Inhibition of Multiple Pathogenic Mechanisms by Structural Variants of the Cyclic Lipopeptide 'Kannurin'

The study focused to unravel the unexplored structural variants of the cyclic lipopeptide 'Kannurin' which was reported earlier in our laboratory in 2013. Since the previous study discussed about the antifungal activity of the lipopeptide, much interest has been invested to investigate its antibacterial activity and mechanism of action. Reports on antimicrobial activity of Kannurin, its multi-targeted action on bacteria, occurrence of structural variants and structure activity relationship are the major contributions of this research work.

Status: PhD Awarded, 2019



Dr. JENSON JACOB

Title of the PhD Thesis: Studies on Anti Inflammatory Activities of Some Medicinal Plants.

The Work was focussed on the anti-inflammatory activities of plants *Mallotus philippinensis* (MP), *Pterospermum reticulatum* (PR) & *Nardostachys jatamansi* (NJ). The plant extracts were found active against oxidative stress and inflammation. The bark of MP was purified based on LOX inhibition and the active principle was crystallised. It was observed that the compound and the active fractions inhibit anti-inflammatory targets. The interaction of compound with LOX and protease was proved by enzyme kinetics, Fluorescence Spectroscopy and *in-silico* studies. Bergenin and the active fractions of NJ and PR have proven effect on pro-inflammatory mediators, both *in-vivo* and cell line models.

Status: PhD Awarded, 2019



Dr. SANDEEP PM

Title of the PhD Thesis: Studies on the effect of some medicinal plants on Polycystic ovary syndrome

Polycystic ovary syndrome (PCOS) is a disorder of excess physiological response to androgens. Therefore, targeting androgens is an important treatment strategy. In this study, plants traditionally used against reproductive disorders were tested for their antiandrogenic properties followed by in-vivo evaluation of PCOS in rat models. The specific objectives of the study were to identify plants with antiandrogenic activity from the plants traditionally used for menstrual irregularities, in-vivo validation of the antiandrogenic activity to assess its influence experimentally and to identify the active principle responsible for antiandrogenic activity. Experiments revealed that plants like *N. jatamansi* and *T. terrestris* showed antiandrogenic activity, while *Embelia tsjeriam - cottam* extract showed both androgenic and anti-androgenic activity.

Status: PhD Awarded, 2019



Dr. AJESH K.

Title of the PhD Thesis: Study of fungal biofilms and the effect of antifungal peptides in drug resistance and virulence.

Cryptococcus laurentii, an aetiological yeast pathogen causing trouble in immunosuppressed patients was studied for their biofilm forming ability and antifungal resistance. In the second part, an anti-fungal surfactin-like lipopeptide produced by *Bacillus cereus* AK1 strain was purified and chemically characterised. It was named "Kannurin" and its chemical structure was elucidated by ESI-MS. In another study, an antifungal protein with a molecular mass of 14.3kDa was also isolated from seeds of *Clitoria ternatea* and designated as Ct protein. It was purified by ion exchange and gel filtration chromatography. The study added to the literature on novel seed proteins with useful antifungal activity.

Status: PhD Awarded, 2013

