

Overview

Historically, nature has been mainstay source for the majority of the drugs in use today. The most well known example of microbe derived natural product drugs are antibiotics. Despite the fact that more than 20,000 microbial secondary metabolites have been described, only a small percentage of these have been carried forward as natural product drugs. This therefore offers wide window of opportunity to explore and identify this microbial wealth for creation of rich library of natural product with vast pharmacological properties and potential therapeutic agents. It may be said here that they are in tough competition with large chemical libraries and with combinational chemistries. Hence, each step of a natural product program has to be more efficient than ever, starting from the collection of environmental samples and the selection of strains, to metabolic expression, genetic exploitation, sample preparation and chemo-profiling. The focus of this division is purification and characterization of novel bioactive molecules from microorganisms and preparation of their derivatives to enhance their activity

Mission and Goals

- ❖ Collection of samples from varied ecological niches
- ❖ Development of SOPs and isolation of new bioactive molecules from different microbial strains and extracts
- ❖ Diversifying microbial natural product strains and extract libraries, characterization of molecules (NMR, MASS) from microbes and evaluation of their biological potency
- ❖ Fine tuning of bioactivity of the molecules with improved activity and less toxicity

Competencies

- ❖ Creation of repository of micro-organisms and methods for identification of microbes and fungi
- ❖ Manipulating microbial physiology to activate microbial natural product machinery
- ❖ Genetically modifying strains for desired microbial natural product
- ❖ Characterization of new molecules from microbes and evaluation of their biological potency
- ❖ Upscaling and fermentation facilities available at pilot plant
- ❖ Purification of proteins Cloning and expression facilities

Area of Research

- ❖ Collection and screening of microbes
- ❖ Taxonomic characterization of microbes after their expression, bio-evaluation
- ❖ Enrichment of microbial repository
- ❖ Isolation and characterization of bioactive molecules
- ❖ Bio-evaluation of pure molecules in the area of cancer and other related diseases

Current/Related Projects

- ❖ Exploitation of India's rich microbial diversity (NWP006)
- ❖ Screening of microorganisms for the development of a biocatalyst tool box with emphasis on novel bacterial cellulase, cold active protease and lipase enzymes for important biotransformations (MLP 007)