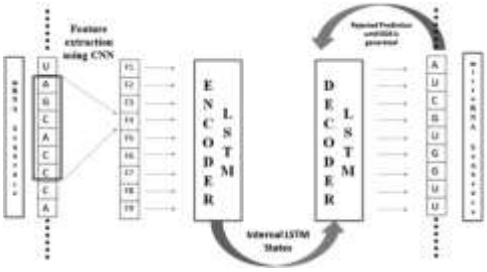
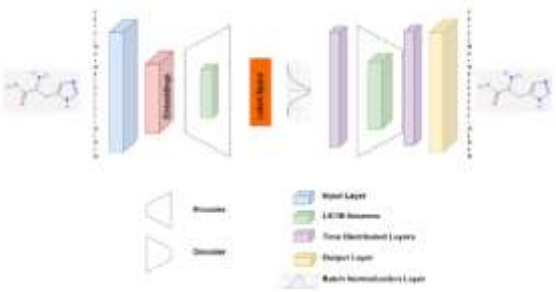
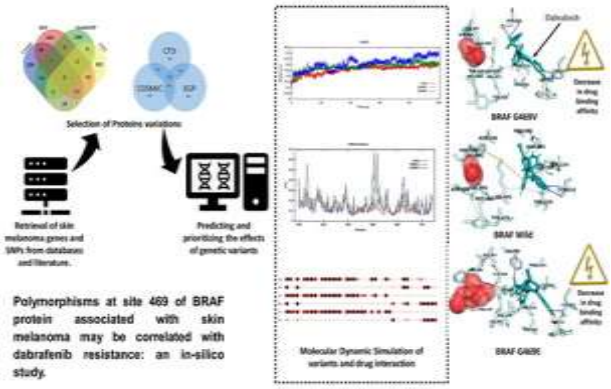
RESEARCH FOCUS OF DEPARTMENT

COMPLEX SYSTEMS AND GENOME INFORMATICS LAB

- *In silico* prediction of microRNA using CNN and LSTM
- AI/ML based biomarker discovery and precision medicine
- Utilizing deep learning for drug lead optimization
- Drug design through molecular docking and simulation, coupled with *in silico* analysis of polymorphisms

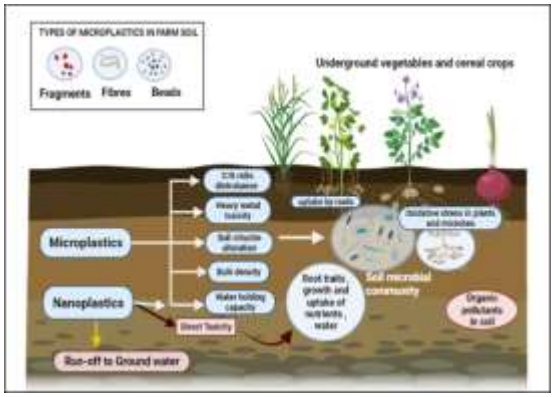


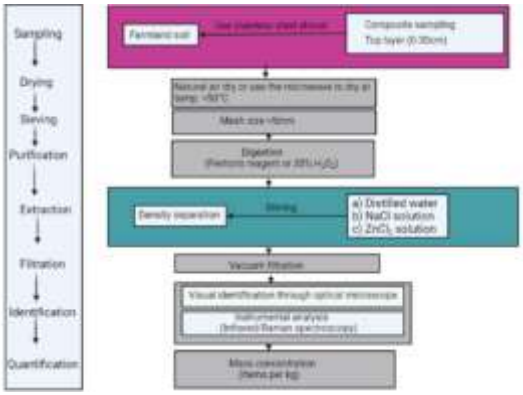




ENVIRONMENTAL AND INDUSTRIAL BIOTECHNOLOGY LAB

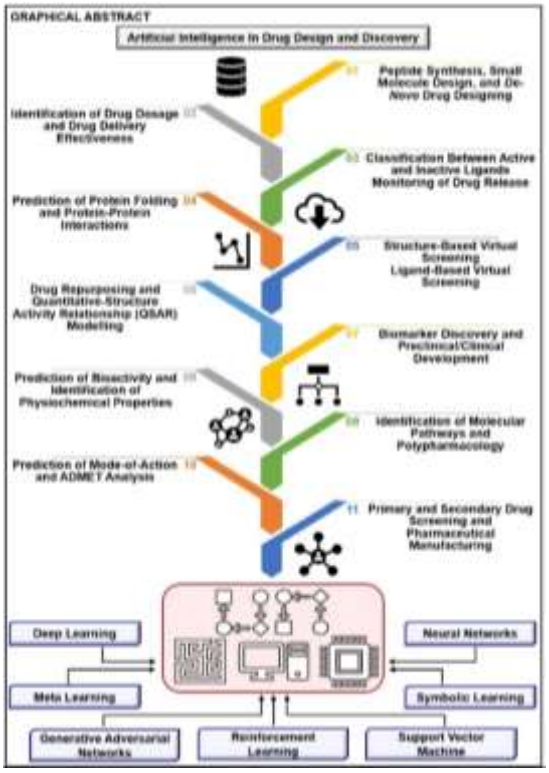
- Effects of microplastics on plant growth and soil properties
- Sampling, extraction, and analysis procedures for microplastics in soil
- Industrial and environmental biotechnology
- Bioremediation
- Medicinal chemistry of plants
- Amino acids profile of medicinal plants
- Water quality management, water chemistry
- Aquatic ecology, aquaculture, fish nutrition
- Radiation biology
- Biosensor
- Bioenergy & Biofuel
- Microbiology
- Nanobiotechnology
- Environmental impact assessment

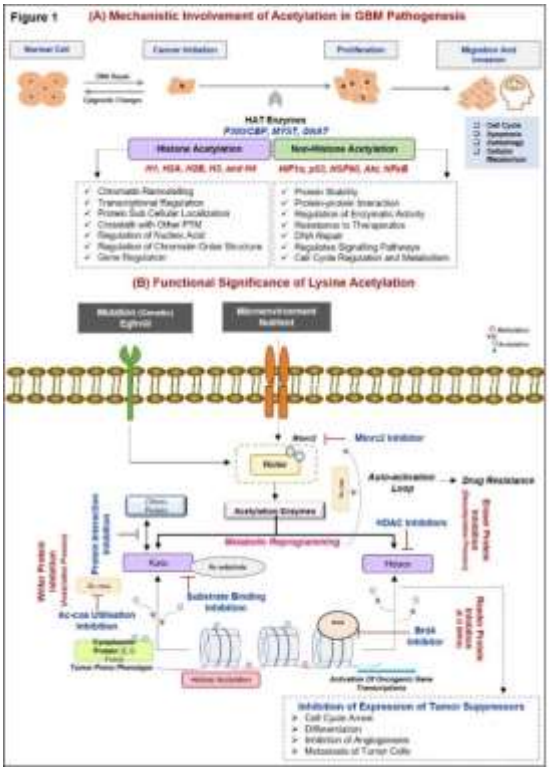




MOLECULAR NEUROSCIENCE AND FUNCTIONAL GENOMICS LAB

- Post translational modification in neurodegenerative disorders
- Ubiquitin E3 ligase mediated clearance of toxic metabolites and UPS assisted therapeutics
- Molecular chaperone assisted therapeutics
- Cross talk through repurposed drugs in neurodegenerative disorders and cancer
- AI/ML based drug discovery in neurodegenerative disorders and brain tumor
- Post mitotic cell division and aberrant cell cycle entry in aged neurons and muscles
- Drug repurposing approach and lead molecule identification

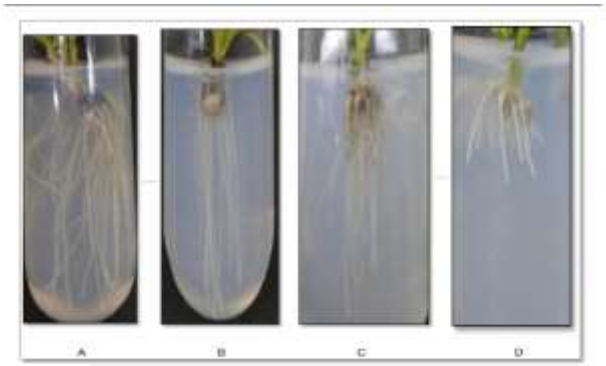




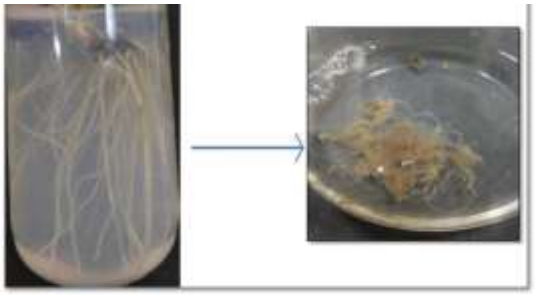
PLANT & ALGAL BIOTECHNOLOGY LAB

- Selection of elite accessions for industrially important secondary metabolites
- Optimization for *in vitro* production of high-value low volume phytochemicals through tissue culture
- Plant tissue and algal culture-based approaches for the production of industrial and medicinal metabolites
- Production of nanoparticles and study of their medicinal and industrial applications
- *In silico* analysis of phytochemicals for potential drug discovery against various diseases
- Phyto and phycoremediation of dyes and heavy metals
- Optimization of biomass production of microalgae for biofuels

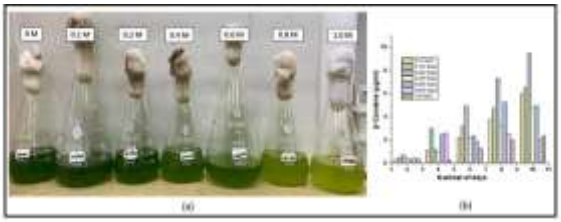
Shoot culture of *Plumbago zeylanica* accessions grown in MS medium with ammonium nitrate and 3% sucrose



Root multiplication of *P. zeylanica* in different media A) MS+1 mg/L IBA B) Nitsch+1 mg/L IBA C) B5+1 mg/L IBA, D) Schenk & Hildebrandt+1 mg/L IBA



Establishment of root suspension culture of *P. zeylanica*



The effect of salt stress on culture, with 0M as control and subsequent increase in NaCl molarity with 0.1M, 0.2M, 0.4M, 0.6M, 0.8M and 1.0M (b) The effect of salt stress on β-carotene accumulation

IMMUNOTHERAPEUTICS LAB

- Cellular immunology and therapeutics
- Modulation of tumor cells for immune evasion
- Development of combinatorial immune therapeutics for cancer
- Prediction of immunodiagnostic markers and plant derived natural compounds for cancer therapy
- Drug design and development of natural compounds as combinatorial treatment for cancer and autoimmune diseases