

## **DEPARTMENT OF BIOTECHNOLOGY** **RESEARCH THRUST AREAS**

To strengthen departmental research, a Centre for Emerging Diseases, and a Research group (Plant & Microbial Biotechnology) have been formed:

### **Center for Emerging Diseases**

Center for Emerging Diseases” addresses the questions of molecular mechanism/pathogenesis/host pathogen interactions of emerging and re-emerging viral (Chikungunya & Chandipura) and bacterial pathogens (*Mycobacterium* and others) and life style diseases such as obesity & diabetes, cancer, cardiovascular and CNS disorders using both wet laboratory and tools of computational biology/bioinformatics (genomics, proteomics and evolutionary approaches). Research emphasis is also on peptide based therapeutics, regulatory peptides, biosensor and ELISA based diagnostics, and drug encapsulated nanoparticles and nanoemulsions.

Thrust area includes

- Disease and Omics Technology
- Bioinformatics
- Nanotechnology
- Industrial Biotechnology
- Medical Biotechnology
- Pharmaceutical Biotechnology

<http://www.jiit.ac.in/sites/default/files/Centre%20for%20Emerging%20Diseases-1.pdf>

### **Center of Excellence in Plant & Microbial Biotechnology**

Plant & Microbial Biotechnology group addresses growing concern over environmental pollution, depleting natural resources and increasing demand of natural bio-products of therapeutic and industrial importance (food flavours-microbial production of Vanillin and probiotics; enzymes -Laccase, protease, tannase, polyphenol oxidase, keratinase from microbial sources, biosynthesis of chitosan, cellulose from microbial sources for bioprocess applications, bio-inoculants of plant and microbial origin for plant growth promotion and antibiosis, microbial remediation of organophosphate pesticides, biocatalyst for the removal of nitrogen and sulphur from petroleum products, phytoremediation of heavy metals-copper (Cu) and lead (Pb); screening for antimicrobial compounds-peptides/antibiotics).

Thrust area includes

- Bioremediation
- Bioresources
- Environmental Biotechnology
- Plant and Agriculture Biotechnology
- Pro- and Prebiotics
- Food Biotechnology
- Microbial Biotechnology

<http://www.jiit.ac.in/sites/default/files/Research%20group-PMB-2018.pdf>

## Center for Technology Solutions for Soil & Water Remediation

Rapid industrialization, increased productivity demands and environmentally inappropriate human activities continuously challenge natural resources including Soil, Air, & Water. Multiple pollutants generated as refuse/effluent present serious environmental threats. Biotechnology offers economical and safe solutions to restore Soil, & Water quality through application of a choice of plants & microbes. At Centre, we aim to address issues of soil & water pollution broadly subdivided into three subdivisions namely: MAR - Microbe Assisted Remediation, PAR - Plant Assisted Remediation, EAR – Enzyme Assisted Remediation. In MAR, Bacteria & Fungi with proven bioremediation capabilities would be employed for clean-up processes in soil / water environments. Under PAR, chosen phytoremediator plants will be applied to decontaminate soil/water of organic and inorganic pollutants. EAR focuses on Metabolites & Enzymes derived from Plants or microbes, developing them as formulations (nano/micro) for bioremediation.

Thrust area includes

- Microbial Remediation
- Phytoremediation
- Environmental Remediation
- Soil Remediation
- Water Remediation

[https://www.jiit.ac.in/sites/default/files/TSSR\\_JAN23.pdf](https://www.jiit.ac.in/sites/default/files/TSSR_JAN23.pdf)