

METAGENOMICS: A TRANSFORMATIVE PLATFORM ADVANCING SUSTAINABLE BIOTECHNOLOGY

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Metagenomics has revolutionised biotechnology by enabling direct sequencing of environmental DNA, overcoming culture-dependent limitations and revealing vast uncultured microbial diversity. Advances in next-generation sequencing and bioinformatics now allow comprehensive taxonomic and functional profiling, driving discoveries in novel enzymes, biosynthetic pathways, and microbial interactions. These insights support innovations in industrial bioprocessing, agriculture, environmental remediation, and human health. Integrated multi-omics and machine learning further enhance genome reconstruction, functional prediction, and synthetic biology applications, establishing metagenomics as a transformative platform for sustainable biotechnological advancements.
