



Dr. D. Y. PATIL SCHOOL OF ALLIED HEALTH SCIENCES

PIMPRI, PUNE - 411 018

Dr. D.Y. PATIL VIDYAPEETH, PUNE

(Deemed to be University)

(Accredited (3rd Cycle) by NAAC with a CGPA of 3.64 on a four-point scale at 'A++' Grade)

ISO 9001: 2015 and 14001: 2015 Certified University

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Ph.D. in Medical Laboratory Technology

Paper II: Recent Advances in Medical Laboratory Technology

Advances in Pathology	Flow cytometry advancements in hematological disorders
	Next-generation sequencing in hematologic malignancies
	Novel anticoagulant monitoring techniques
	Point of care coagulation testing
	Novel biosensor technologies
	Sample preparation innovations
	Liquid-based cytology techniques
	Molecular markers in cytopathology
	Digital cytology and telepathology
	Mobile health diagnostics
	Next-generation sequencing in blood group typing
	Digital pathology and whole slide imaging
	Multiplex immunohistochemistry
	Tissue microarrays and automated analysis
	Total laboratory automation systems
	Artificial intelligence in laboratory workflows
	Pre-analytical automation advancements
Advances in Biochemistry	Recombinant DNA technology
	FISH
	Multiplex PCR platforms
	CRISPR-based diagnostic technologies
	Mass Spectrometry (MS)
	Nuclear Magnetic Resonance (NMR) Spectroscopy
	High Performance Liquid Chromatography (HPLC)
	Next Generation Sequencing (NGS)
	Microarrays
	X-Ray Crystallography

Advances in Biochemistry	Liquid Chromatography- Mass Spectrometry (LC-MS)
	Fluorescence Resonance Energy Transfer (FRET)
	Molecular Docking & Dynamics Simulations
Advances in Microbiology	Matrix-Assisted Laser Desorption/Ionization – Time of Flight (MALDI-TOF MS)
	Electron Microscopy (SEM& TEM)
	Fluorescence Microscopy (FM)
	Automated blood culture systems
	Syndromic panel testing
	Phenotypic antimicrobial susceptibility testing innovations
	Rapid phenotypic AST techniques
	Novel approaches to susceptibility testing
	Metagenomics
	Quartz Crystal Microbalance (QCM)
	Laser Capture Microdissection (LCM)
	Automated Colony Counters & AI-Powered Image Analysis
	Genotypic resistance detection methods