

PRESERVATION AT A GLANCE

Method	Best For	Pros	Limitations
Frozen	Molecular Analysis	Preserves integrity (molecular structure and chemical composition)	Requires ultra-cold storage
	Disease Diagnosis and Classification, Archival Storage	Minimal ice crystallization (smaller tissue sizes)	Not ideal for live cells
	Comparative studies and Cohort Analysis	Cost effective	Larger tissue specimens can form ice crystals within the tissue
	Quality Control		
	Assay Optimization		
Fresh	Precision medicine	Unprocessed tissue	Requires rapid transport
	Drug Discovery		Logistical challenges for delivery
	Cell lines		
	Organoids		
	Modeling		
	Early-stage immunotherapy development		
	Xenografts		
	Circulating Tumor Cells		
	Biomarker discovery		
Fixed (FFPE)	Histopathological analysis	Long-term storage	Possible degradation of DNA and RNA

	Immunohistochemical Analysis Tissue Archives and retrospective studies	Maintains cellular proteins and nucleic acids Maintains tissue morphology Ambient temperature storage 10% formalin penetrates tissues quickly Works with a wide range of downstream applications Work with a wide range of dyes and staining protocols Easy to store and cost effective Prevents autolysis Maintains antigenicity	Difficulty extracting high-quality intact nucleic acids for Next Generation Sequencing or gene profiling Processing time involved