

Evading Apoptosis: Cell Based Assays

As leaders in cancer research, Merck Millipore scientists have developed a wide range of assays and reagents to help uncover apoptosis mechanisms and possible ways to induce apoptosis in tumor cells for therapeutic benefit.

Whether cells are in the early stages of apoptosis (with exposed inner leaflets), intermediate stages (with active caspase activity), or late stages (with extensive DNA fragmentation), Merck Millipore's reagents and cell-based assays detect specific cell death processes across the apoptotic timeline.

Our apoptosis assays utilize all major detection methods, platforms and technologies, including (but not limited to) TUNEL assays, cell based assays, high content analysis, flow cytometry, and quantitative biomarker immunodetection. Merck Millipore's versatile, innovative approach brings unprecedented depth and breadth to apoptosis research worldwide.



Apoptosis Cell Based Assays From Merck Millipore

EARLY STAGE

Hallmark Apoptotic Event	Concept	Merck Millipore Product	Detection Options	Sample Type
Phosphatidylserine Detection (PS)	Detection of early Apoptosis with direct staining of the phosphatidylserine flip on the outer cell membrane	ApopNexin™ Kit	Fluorometric	Adherent cells
				Suspension cells
		Guava Nexin® Reagents	Fluorometric	Suspension cells
		Anti-Phosphatidylserine	Colorimetric	Adherent cells
			Fluorometric	Suspension cells
Mitochondrial Permeabilization	Direct measure of changes in mitochondrial membrane potential	Guava® Mitochondrial Depolarization Kit	Fluorometric	Suspension cells
	Detect potential-sensitive color shifts induced by uncouplers of mitochondrial respiration	MitoLight® Mitochondrial Apoptosis Detection Kits	Fluorometric	Adherent cells
				Suspension cells
		Jc-1 dye	Fluorescent	Cell Lysates
Chromatin Condensation	Direct measure of accumulated phosphorylated H2A.X, an indicator of early DNA strand breaks	Phosphorylation Detection Kits	Colorimetric	Adherent cells
			Fluorometric	Suspension cells
			Chemiluminescent	Tissue
	Formamide denaturation of DNA in apoptotic cells, but not in necrotic cells; reflects chromatin condensation	ssDNA ELISA Kit MILLIPLEX® MAP H2A.X MAPmates		Cell Lysates
			Colorimetric	Adherent cells
			Fluorescent	Suspension cells
				Tissue
Caspase Cascade	Inverse measurement of specific caspase activity in live cells using inhibitor binding	CaspTag™ Kits	Fluorometric	Adherent cells
				Suspension cells
				Tissue
	Direct measurement of any caspase activity in live cells following cleavage of a substrate	CaspSCREEN™ Kit	Fluorometric	Suspension cells
	Inverse measurement of specific caspase activity in live cells using inhibitor binding	Guava® Caspase and Dual Caspase Kits	Fluorometric	Suspension cells
	Direct measurement of specific caspase activity following cleavage of a substrate	Caspase Activity Kits	Colorimetric	Cell lysates
			Fluorometric	
			Chemiluminescent	
DNA Fragmentation	Detect DNA fragmentation using TUNEL methodology	Guava® TUNEL Kit	Fluorometric	Suspension cells
		ApopTag® TUNEL Kits	Colorimetric	Adherent cells
			Fluorometric	Suspension cells
				Tissue
	Identification of characteristic DNA fragmentation specific to apoptotic cells using oligonucleotide ligation	ApopTag® ISOL Kits	Colorimetric	Adherent cells
			Fluorometric	Suspension cells
				Tissue
	Direct measure of fragmented genomic DNA by electrophoretic separation	DNA Ladder Kit	Agarose	Cell lysates
	Direct measurement of PARP activity in DNA damage repair	PARP Enzyme Activity Assay	Fluorometric	Protein standard

LATE STAGE

	Application	Advantages	Catalogue No.
	Immunofluorescence	Effective: Classic model	APT750
	Cytometry	Versatile: Detection options	
	Flow Cytometry	Effective: Classic model	4500-0450, 4500-0455, FCCH100108, FCCH100138
		Versatile: Detection options	
	Immunohistochemistry	Sensitive: Highly specific marker	05-719, 16-256
	Immunofluorescence	Versatile: Detection options	
	Cytometry		
	Flow Cytometry	Simple: Results in 20 minutes	4500-0250, FCCH100109, FCCH100106
		Effective: Classic model	
	Immunofluorescence	Simple: Results in 20 minutes	APT142, APT242
	Cytometry	Effective: Classic model	
	Multiplex	Sensitive: Highly specific marker	420200-5MG
	Immunohistochemistry	Sensitive: Highly specific marker	17-327, 17-344
	Immunofluorescence	Flexible: Multiple kit options	FCCS100182, FCCS025153
	Flow Cytometry		
	Cytometry		
	CELISA		
	ELISA	Sensitive: Distinguishes apoptosis and necrosis with unique ssDNA antibody	APT225
		Simple: Easy model to detect early apoptotic events	
	Immunofluorescence	High affinity: Irreversible binding	APT400, APT403, APT408, APT409, APT420, APT423, APT428, APT429, APT500
	Cytometry	Effective: Classic model	
	Plate reader		
	Cytometry	Efficient: Quick, direct measure of any caspase activation	APT105
	Flow Cytometry	High affinity: Irreversible binding	4500-0500, 4500-0520, 4500-0530, 4500-0540, 4500-0550, 4500-0560, 4500-0570, 4500-0580, 4500-0590, 4500-0630, 4500-0640, 4500-0650
		Effective: Classic model	
	Plate reader	Versatile: Fluorometric versus colorimetric options	APT129, APT131, APT163, APT165, APT166, APT168, APT169, APT171, APT172, APT173, APT176
	Flow Cytometry	Reliable: Many peer-reviewed citations	4500-0121
		Sensitive: Low background with plant- derived labeling	
		Flexible: Multiple detection options	
		Accurate: Control slides available	
	Immunohistochemistry	Reliable: Many peer-reviewed citations	S7100, S7101, S7110, S7111, S7160, S7165
	Immunofluorescence	Sensitive: Low background with plant- derived labeling	
	Cytometry	Flexible: Multiple detection options	
		Accurate: Control slides available	
	Immunohistochemistry	Sensitive: Minimize background with <i>in situ</i> labeling technique	APT1000, S7200
	Immunofluorescence	Accurate: Reduction of false positives	
		Unique: Differentiation of Type I (caspase independent) and Type II (caspase dependent) events	
	Electrophoresis	Effective: Classic model	APT151
			17-10149



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