

Biological Endpoint	Background	Detection	Platform Format	Reference Compounds	Turnaround Time
Apoptosis / Necrosis	Programmed cell death as prominent mechanism for cytotoxicity	Staining of apoptotic and necrotic cells	Single tubes Flow cytometry	Camptothecin	2 weeks
Cardiotoxicity	Cell-type specific toxicity	Relative survival of primary rat cardiomyocytes	96-well plate Fluorescence	Doxorubicin	4-6 weeks
Cell Cycle Arrest Cell Cycle Kinetics	Activation of cell cycle check points	Labeling of S-phase cells and DNA-counterstaining with propidium iodide	Edu-pulsing Flow cytometry	Taxol	2-3 weeks
Cell Division Pattern & Senescence	Division into F1-generations is unequal within cell culture	Fluorescently labeled cells are monitored for F-generations	Single tubes Flow cytometry	Various chemotherapeutics	1-2 weeks
Cell Leakage	Damage of membrane integrity, outward direction	LDH release	96-well plate Bioluminescence	Loratadine Tamoxifen	1-2 weeks
Cell Proliferation & Senescence	Drug toxicity affects cell proliferation	Neutral Red Uptake	96-well plate Absorption	Doxorubicin	1-2 weeks
DNA fragmentation	Final stage in drug-induced apoptosis as marker for cytotoxicity	DNA staining with propidium iodide	Single tubes Flow cytometry	Various chemotherapeutics	1-2 weeks
Energy Content	Energy depletion causes cell damage and death	Detection of intracellular ATP content	96-well plate Bioluminescence	Doxorubicin	1-2 weeks
Histamine Release	Early sign of immunogenic reaction in vivo	Quantification of histamine release by rat mastocytes	Single tube Absorbance	Compound 40/80 Cetorelix	2-3 weeks
Immunotoxicity	In vivo changes of immune status	Antibody staining of rat peripheral blood cells	Single tube Flow cytometry	Cyclophosphamide	2-3 weeks
Intracellular Calcium	Second messenger, involved in many cellular signal processes	Detection of Ca with Fluo-4	Single tube Flow cytometry	Carbachol	1-2 weeks
Membrane Damage	Damage of membrane integrity, inward direction	Propidium iodide uptake	Single tubes Flow cytometry	Loratadine Tamoxifen	1-2 weeks
Mitochondrial Activity	Drugs cause reduction in mitochondrial output	Measurement of metabolic activity	96-well plate Fluorescence	Doxorubicin	1-2 weeks
Mitochondrial Transmembrane Potential	Early event affecting energy production, Ca-level, ROS	Dye staining	Single tube Flow cytometry	Rotenone Antimycine A	1-2 weeks
Mutagenicity	Increased number of micronucleated reticuloctyes	Enumeration of micronucleated cells with gTox kit	Single tubes Flow cytometry	Mitomycin	3 weeks
Reactive Oxygen Species	Xenobiotic assaults can cause generation of ROS followed by cell death	Modification of a non-fluorescent to a fluorescent dye	Single tubes Flow cytometry	PMA	1-2 weeks
Toxicokinetics	Cytotoxic effects evident only after prolonged drug exposure	Measurement of metabolic activity over several days	96-well plate Fluorescence	Doxorubicin	2-3 weeks