Apoptosis Reagents

Apoptosis is a process of programmed cell death. It is a normal process in many multicellular organisms, and typically occurs when a cell is damaged beyond repair. The apoptotic process is characterized by cell shrinkage, DNA fragmentation and membrane blebbing, and is carried out in a way to safely dispose of cell corpses and fragments. Apoptosis generally affords benefits during an organism's life cycle, as opposed to necrosis, which is a form of traumatic cell death resulting from acute cellular injury. Every day, billions of cells die due to apoptosis in the average human adult. The signal for apoptosis can be triggered by the cell itself (intracellularly) or from an extracellular source such as a toxin, hormone, growth factor, cytokines, nitric oxides and even other cells that are part of the immune system. Additionally, there are triggers that may inhibit the induction of apoptosis, resulting in uncontrolled cell growth.

Apoptosis is a multi-step, multi-pathway cell-death program that is inherent in every cell of the body. In cancer, the apoptosis cell-division ratio is altered. Cancer treatment by chemotherapy and irradiation kills target cells primarily by inducing apoptosis. In addition to its importance as a biological phenomenon, defective apoptotic processes have been implicated in an extensive variety of diseases. Excessive apoptosis causes atrophy, whereas an insufficient apoptosis results in uncontrolled cell proliferation, such as the aforementioned cancer. Tumor cells and viruses often use methods to prevent the induction of apoptosis and ward off host defense mechanisms. Due to this link with the immune system, apoptosis is relevant to many different disease states including cancers, inflammation and AIDS.

Apoptosis Inducers

Item	Description	Mode of Action	Sizes
J60148	Actinomycin D	Polypeptide antibiotic shown to have anti-cancer activity. It disrupts transcription by binding to DNA and inhibiting RNA polymerase, which prevents RNA elongation.	5mg
J63522	Antimycin A	Inhibits the electron transport of oxidative phosphorylation, subsequently inhibiting ATP production, which can induce apoptosis.	5mg, 10mg
J62340	Brefeldin A, 99%	A lactone antibiotic that blocks translocation of proteins from ER to Golgi inducing p53 independent apoptosis	10mg, 25mg, 50mg
J62906	Chelerythrine Chloride, 99+%	Induces apoptosis in leukemia cells through selective protein kinase C inhibition.	5mg, 10mg, 25mg
J60927	Clofarabine, 99+%	A purine nucleoside antimetabolite that inhibits ribonucleotide reductase and DNA polymerase, resulting in inhibition of DNA repair and synthesis of DNA & RNA. It also disrupts mitochondrial function and membrane integrity, resulting in the release of pre-apoptotic factors.	50mg, 100mg, 250mg
J60342	Clofibrate	Peroxisome proliferator-activated receptor-a agonist. It induces apoptosis in hepatoma cells and increases lipoprotein lipase activity.	1g, 5g, 25g, 100g
J61072	Colchicine, 98+%	Microtubule disrupting agent, and inducer of apoptosis in human lymphoma cells.	500mg, 1g, 5g
J61221	Concanavalin A	A plant lectin that is a T-cell mitogen, and induces apoptosis in human fibroblasts.	100mg, 250mg
J61023	Dacarbazine	An antineoplastic alkylating agent which destroys cancer cells by adding an alkyl group to its DNA.	500mg, 1g

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J63091	Ecdysterone	A steroid hormone that controls moulting in insects and induces apoptosis. Useful in research as an inducer in transgenic animals, where introduction of a new gene is under the control of an introduced ecdysone receptor.	10mg, 50mg
J60814	(-)-Epicatechin gallate	A flavanoid found in green tea that inhibits bets amyloid protein induced apoptosis.	10mg, 20mg
J63990	Imiquimod, 99%	An immune response modifier causing cells to secrete certain cytokines, like Tumor Necrosis Factor-α. It also activates Caspase 3.	100mg, 1g
J60743	Irinotecan hydrochloride	Prevents DNA from unwinding by inhibition of topoisomerase 1, which inhibits DNA replication and transcription.	50mg, 250mg
J62452	Melatonin, 99+%	A pineal gland hormone associated with sleep regulation. It activates melatonin receptors and has been shown to induce apoptosis.	5g, 25g
J63193	Mitomycin C	Antineoplastic agent which is a potent DNA crosslinker, thus inhibiting DNA synthesis and inducing apoptosis.	1mg, 5mg, 10mg
J63598	Vinblastine sulfate, 98%	Disrupts microtubule formation and proper formation of mitotic spindles by binding to tubulin.	10mg, 50mg
J60907	Vincristine sulfate, 98%	Binds to tubulin dimers, inhibiting assembly of microtubule structures. Disruption of the microtubules arrests mitosis during metaphase.	10mg, 25mg

Apoptosis Inhibitors

Item	Description	Mode of Action	Sizes
J62823	Benzamidine HCl, 99%	Reversible inhibitor of trypsin and serine proteases.	5g, 10g
J93191	Cyclosporin A,99+%	An immunosuppressant that interferes with the growth of T-cells, and inhibits angiogensis. It also inhibits lymphokine production and interleukin release.	1g, 5g
J63763	Daidzein (4',7-Dihydroxy-isoflavone), 98+%	An analog of Genistein and an antagonist at estrogen receptor sites. It transactivates all PPAR (peroxisome proliferator-activated receptors) and interferes with the anti-tumor properties of tamoxifen.	100mg, 500mg, 1g
J60224	Daunorubicin HCl	Stabilizes the topoisomerase II complex after it has broken the DNA chain for replication, preventing the DNA double helix from being resealed and thus disrupting the replication process during transcription.	10mg
J61286	R-(-)-Deprenyl HCl	A monoamine oxidase B inhibitor with apoptotic and anti-apoptotic properties	250mg, 1g
J64000	Doxorubicin HCl	Similar to daunorubicin, it inhibits DNA topoisomerase II and disrupts replication.	10mg, 50mg
J63190	Ebselen	Inhibits nitric oxide induced apoptosis. It is a potent scavenger of hydrogen peroxide including membrane-bound phospholipid hydroperoxides.	5mg, 25mg

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Item	Description	Mode of Action	Sizes
L00355	N-Ethylmaleimide, 98+%	Inactivates NADP-dependent isocitrate dehydrogenase and many endonucleases. It is an irreversible inhibitor of all cysteine peptidases and blocks vesicular transport. Has been reported to inhibit DNA polymerase III.	10g, 50g
J63241	Genistein (4',5,7-Trihydroxy-isoflavone), 99+%	Inhibits tyrosine protein kinase and DNA topoisomerase II, thus interferring with DNA synthesis. Also blocks the Epidermal Growth Factor receptor.	100mg, 1g, 10g
J63166	Naringin	A flavanone glycoside that inhibits cytochrome P450 enzymes and demonstrates anti-cancer properties. A potent inhibitor of VEGF release, which causes angiogenesis.	25g, 100g
J62734	Paclitaxel, 99.5+%	A mitotic inhibitor that targets tubulin and inhibits microtubule dsassembly. This blocks progression of mitosis and triggers apoptosis.	100mg, 500mg, 1g
J61772	Sulindac	A non-steroidal anti-inflammatory drug (NSAID) that inhibits cyclooxygenase-1 and induces apoptosis in HT-29 cells	5g, 25g
J63509	Tamoxifen, 98+%	Binds to estrogen receptors on tumor cells, producing a nuclear complex that decreases DNA synthesis. It inhibits protein kinase C, reduces serum IGF-1 levels and induces apoptosis in chondrocytes.	500mg, 1g, 5g
J60955	Tamoxifen citrate	Inhibits protein kinase C and mammalian sterol isomerase. Reported to induce apoptosis in breast cancer cells. A more soluble form of tamoxifen.	1g, 5g

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