Natural Products for Life Science Research

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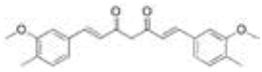
Curcumin

Curcumin (C8069) is a principle component of turmeric, a member of the ginger family. Curcuminoids are responsible for the yellow color of turmeric.

In cellular models of glioma, curcumin downregulates expression of Shh, Smo, GLI1, cyclin D1, and Bcl-2, inhibiting proliferation and migration and increasing apoptosis. Curcumin also decreases tumor volume and prolongs survival in animal models.

Curcumin also decreases NADPH-oxidase mRNA and hydrogen peroxide levels, decreasing oxidative stress in animal models of exercise-induced oxidative stress.

Curcuminoids such as **Dimethoxycurcumin (D3449)** display similar biological activities with a stronger pharmacokinetic profile. Dimethoxycurcumin induces DNA damage and apoptosis in breast cancer cells. Similarly, **Bisdemthoxycurcumin (B3573)** inhibits DNMT1, α-amylase, and WIF-1 promoter demethylation and may induce phase II enzyme activation.



C8069 Curcumin

Cat #	Product Name	Description	Purity
C8069	Curcumin	Extract from turmeric	≥97%
C8070	Curcumin, high purity	Active compound found in turmeric	≥98%
D3420	4-(3,4-Difluorobenzo)curcumin	Curcumin derivative	≥95%
B3573	Bisdemethoxycurcumin	Curcumin derivative	≥98%
D3449	Dimethoxycurcumin	Curcumin derivative	≥98%
D1850	Demethoxycurcumin	Curcumin derivative	≥98%
F4452	4-(3-Fluoro-4-nitrobenzo)curcumin	Curcumin analog	≥98%

Soy Isoflavones

Many isoflavones can be isolated from soy, including **Genistein (G1652)** and **Daidzein (D0032)**; these compounds are also phenolic phytoestrogens. Isoflavones such as these can also be found in beans and other legumes.

Genistein induces phase II enzymes such as Nrf2, superoxide dismutase, and heme oxygenase 1 in vitro. In animals fed a high fat diet, genistein decreases body weight, liver weight, lipid levels, and insulin dysregulation by inhibiting S6K1 signaling. In colon cancer cells, genistein induces G2/M phase cell cycle arrest and apoptosis.

Daidzein also displays antioxidative and anticancer benefits. In vivo, daidzein increases levels of superoxide dismutase, catalase, glutathione peroxidase, and glutathione-S-transferase, inhibiting DMBA-induced breast cancer development.

Biochanin A (B3358) is another soy isoflavone. In pancreatic cancer cells, this compound inhibits cellular proliferation, migration, and invasion. Biochanin A also improves cognitive deficits in animal models of Alzheimer's disease.

Cat #	Product Name	Description	Purity
B3358	Biochanin A	Phytoestrogen	≥98%
D0032	Daidzein	Phytoestrogen	≥97%
G1652	Genistein	Phytoestrogen	≥98%
E6781	(±)-Equol	Isoflavone, phytoestrogen	≥98%
F5770	Formononetin	Isoflavone found in legumes	≥90%

Green Tea

Green tea catechins are polyphenols that can be isolated from green tea (*Camellia sinensis*). Green tea catechins display a variety of known health benefits, including antioxidative, anti-inflammatory, anticancer, and antimicrobial activities.

Epigallocatechin Gallate (E6234) is one flavonoid isolated from green tea. Epigallocatechin gallate directly inhibits the aryl hydrocarbon receptor and STAT3, two activities potentially linked to its chemopreventive properties. In animal models of bladder cancer, this compound decreases tumor growth; in other cellular models of cancer, it indirectly inhibits EGFR and induces apoptosis.

Catechin (C0278, 99%) is a flavonoid isolated from green tea that displays similar benefits. Catechin decreases tumor number and formation in animal models of colorectal cancer. This compound also increases life span in *Caenorhabditis elegans* and inhibits MAO-B in vitro.

In animal models of myocardial ischemia and reperfusion, **Epicatechin (E6231)** decreases myocardial infarct size and improves mitochondrial respiration. **Epicatechin Gallate (E6232)** and **Epigallocatechin (E6233)** display agonist activity at cannabinoid 1 receptors. **Gallocatechin (G0243)** exhibits antiviral activity, inhibiting HIV-1 reverse transcriptase and integrase. Gallocatechin also inhibits α-amylase, decreasing the absorption of carbohydrates and limiting increases in blood glucose levels.

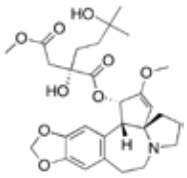
Cat #	Product Name	Description	Purity
G6817	Green Tea Polyphenols	Extract found in green tea	≥95%
C0278	(+)-Catechin	Flavanol found in Camellia	≥99%
E6231	(−)-Epicatechin	Flavanol found in Camellia	≥93%
E6232	(−)-Epicatechin gallate	Flavanol found in Camellia	≥98%
E6233	(−)-Epigallocatechin	Flavanol found in Camellia	≥98%
E6234	Epigallocatechin Gallate	Flavanol found in Camellia	≥98%
E6236	Epigallocatechin Gallate Octaacetate	EGCG/green tea catechin derivative	≥98%
G0243	(−)-Gallocatechin	Polyphenol found in Camellia	≥98%
G0245	Gallocatechin Gallate	Polyphenol found in Camellia	≥98%

Harringtonine

Harringtonine (H0169) is an alkaloid that is found in *Cephalotaxus hainanensis*, a species of conifer also known as the Hainan plum-yew. Harringtonine inhibits protein synthesis through translation elongation inhibition by preventing substrate binding to the acceptor site on the 60-S ribosome subunit, thereby blocking aminoacyl-tRNA binding and peptide bond formation.

Harringtonine inhibits cell growth in acute promyelocytic leukemia (APL) cells. It improves the efficacy of co-administered chemotherapeutic compounds, further inhibiting proliferation and inducing apoptosis in leukemia cells when used in conjunction with compounds such as bortezomib.

Homoharringtonine (H5770) acts via a similar mechanism and shows efficacy in the treatment of chronic myeloid leukemia as an alternative for patients who are resistant to tyrosine kinase inhibitors.



H0169 Harringtonine

Sulforaphane

R-Sulforaphane (S8046) is an organosulfur compound derived from metabolism of glucoraphanin, a glucosinolate. This compound is a natural product that contains an isothiocyanate (N=C=S) moiety. Isothiocyanates can be found in other cruciferous vegetables such as cauliflower, broccoli, radish, kale, and cabbage.

Sulforaphane, also known as 4-methylsulfinylbutyl isothiocyanate and (-)-1-isothiocyanato-4-(*R*)-(methylsulfinyl) butane, displays a variety of interesting characteristics including anticancer, antimicrobial, antioxidative, anti-inflammatory, and neuroprotective activities. In various cellular models, sulforaphane inhibits proliferation of bacteria such as *Escherichia coli* and *Helicobacter pylori*.

Synthetic **R,S-Sulforaphane (S8044)** is a racemic mixture that exhibits chemopreventive benefit, inhibiting cell proliferation and preventing tumor growth in animal models of melanoma. Like other isothiocyanates, sulforaphane also induces expression and activity of phase II detoxifying enzymes such as quinone reductase, glutathione-S-transferase, glutathione peroxidase, and other enzymes. In human prostate cell lines sulforaphane was found to induce phase II enzymes and to increase the synthesis of glutathione. Sulforaphane is also a strong Phase I enzyme inhibitor; it inhibits cytochromes P450 2E1 and P450 1A2, two metabolizing enzymes associated with activation of carcinogens.

Additionally, this compound also induces expression of Nrf2, a transcription factor involved in the regulation of endogenous antioxidants. Increased expression of Nrf2 protects against oxidative damage triggered by inflammation or other injury.

R-Sulforaphane, the naturally produced isomer, displays stronger bioactivity than **S-Sulforaphane (S8045)**, a synthetic isothiocyanate.

Cat #	Product Name	Description	Purity
S8046	R-Sulforaphane	Natural R isomer of sulforaphane	≥98%
S8044	R,S-Sulforaphane	Synthetic racemic mixture of R and S isomers	≥98%
S8045	S-Sulforaphane	Synthetic S isomer of sulforaphane	≥97%
M1875	Sulforaphane glutathione	Glutathione conjugate of sulforaphane	≥98%
A0822	N-Acetyl cysteine sulforaphane	N-acetyl-cysteine conjugate of sulforaphane	≥98%
M1873	L-cysteine sulforaphane	L-cysteine conjugate of sulforaphane	≥98%

Garlic compounds

The anticancer compounds in onion and garlic are organosulfurs; these are released when their bulbs are cut and exposed to oxygen. Organosulfur compounds display benefit in the prevention of lung, esophagus, forestomach, colon, and mammary tumors.

Diallyl Sulfide (D3201) decreases diethylstilbestrol-induced DNA damage and carcinogenesis in vitro and in vivo; it also inhibits the development of colon polyps in other carcinogenesis models.

Allyl Disulfide (A4544) induces G2/M phase cell cycle arrest and apoptosis in leukemia cells. Allyl disulfide also induces phase II enzymes.

Diallyl Trisulfide (D3202) induces phase II enzymes as well, increasing levels of catalase, superoxide dismutase, and glutathione peroxidase. Diallyl trisulfide also suppresses HDAC activity and prevents tumor growth in animal models of glioblastoma.

Like other organosulfurs, **Dipropyl Sulfide (D3262)** also induces activity of phase II enzymes.

Cat #	Product Name	Description	Purity
A4443	L-(+)-Alliin	Optically active cysteine derivative found in Allium.	≥98%
A4544	Allyl Disulfide	Organosulfur found in garlic.	≥98%
A4440	Allicin	Organosulfur found in garlic.	≥98%
A4441	Allicin, aqueous	Allicin in aqueous solution at 25 mg/mL.	≥98%
B1654	Benzyl Selenocyanate	Organoselenium compound found in selenium-enriched garlic	≥98%
D1757	L-Deoxyalliin	Organosulfur found in garlic.	≥98%
D3201	Diallyl Sulfide	Organosulfur found in garlic.	≥97%
D3202	Diallyl Trisulfide	Organosulfur found in garlic.	≥98%
M1566	(+)-S-Methyl-L-cysteine-S-oxide	Alliin analog found in cruciferous vegetables.	≥98%
M1564	S-Methyl-L-cysteine	Antioxidant found in Brassicaceae family plants.	≥99%
T7232	S-Trityl-L-cysteine	Organosulfur found in garlic; kinesin Eg5 inhibitor.	≥98%

Erucin

Erucin (E6880) is an isothiocyanate that can be isolated from arugula and other cruciferous vegetables. Erucin is also an analog of sulforaphane. Like other isothiocyanates, erucin exhibits a wide variety of biological activities in research models, including chemopreventive, antioxidative, anticancer, anti-inflammatory, and neuroprotective properties.

In vitro, erucin suppresses benzo(a)pyrene-induced genotoxicity by inducing activity of detoxifying enzymes such as quinone reductase and glutathione-S-transferase. Erucin also induces apoptosis in hepatocellular carcinoma cells and decreases telomerase activity in animal models of liver cancer. In breast cancer cells, erucin induces cell cycle arrest and apoptosis by impairing microtubule dynamics.

The ability of erucin to increase levels of antioxidative enzymes is also neuroprotective. Erucin suppresses 6-OHDA-induced neurotoxicity and neuronal apoptosis in cellular models of Parkinson's disease.

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Natural Product Categories

- Carotenoids
- Flavonoids
- Ginsenosides
- Isothiocyanates
- Marine toxins
- Mycotoxins
- Phytoestrogens
- Snake venoms
- Soy isoflavones
- Vinca alkaloids

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LKT Laboratories specializes in isolating high purity chemical compounds from natural sources. Our line of natural products are all required to meet our rigorous quality control standards in both rotation and purity. The reason we are so well equipped to handle natural product extraction is because we are using high performance counter current chromatography among other methods. This separation method has the advantage of nearly 100% sample recovery, no sample degradation, and full polarity coverage in one single run. Separation scales can range from a few milligrams to several grams. Inquire today about getting LKT Labs to work on your next project!