

Ferroptosis Research Tools



Ferroptosis is an iron-dependent cell death that is triggered when oxidized polyunsaturated fatty acids (PUFAs) in lipid membranes are not repaired or protected by glutathione peroxidase 4 (GPX4), ferroptosis suppressor protein 1 (FSP1), or tetrahydrobiopterin activity. Cayman offers a comprehensive tool kit to study this process.

Identify Novel Inducers of Ferroptosis

GPX4 Inhibitor Screening Assay Kit

Item No. 701880

- Includes recombinant human GPX4 and positive control GPX4 inhibitor ML-162
- Assay 45 samples in duplicate or 29 samples in triplicate
- Plate-based colorimetric measurement (340 nm)

FSP1 Fluorescent Inhibitor Screening Assay Kit

Item No. 701900

- Includes recombinant human FSP1 and positive control FSP1 inhibitor iFSP1
- Assay 45 samples in duplicate or 29 samples in triplicate
- Plate-based fluorometric measurement (590 nm)

GPX Detection

Item No.	Product Name
703102	Glutathione Peroxidase Assay Kit
26906	GPX4 (human, recombinant); selenocysteine incorporation confirmed by MS
10005258	GPX4 Polyclonal Antibody

FSP1 Detection

Item No.	Product Name
29611	FSP1 (human, recombinant)
29554	Coumarin-Quinone Conjugate

Glutathione (GSH) Assays & Derivatives

Item No.	Product Name
703002	Glutathione Assay Kit
600360	Glutathione Cell-Based Detection Kit (Blue Fluorescence)
14953	Glutathione ethyl ester
10007461	L-Glutathione, reduced

GSH Redox/Detox Assays & Antibodies

Item No.	Product Name
703202	Glutathione Reductase Assay Kit
703302	Glutathione S-Transferase Assay Kit
10010013	Glutathione S-Transferase Polyclonal Antibody
10197	Glutathione S-Transferase Polyclonal FITC Antibody

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www.caymanchem.com/literature

Read about the elements that trigger and suppress the ferroptotic pathway at www.caymanchem.com/ferroptosis

Ferroptosis Inducers (FINs)

Class I FINs

These inducers interfere with GSH production by limiting cystine uptake.

Item No.	Product Name
31806	CAY10773
17754	Erastin
27087	Erastin2
27088	Imidazole Ketone Erastin (IKE)
15025	Sulfasalazine

Class II FINs

These inducers suppress GPX4 activity, allowing lipid peroxides to accumulate.

Item No.	Product Name	Item No.	Product Name
30784	JKE-1674	23282	ML-210
30786	JKE-1716	32812	PACMA 31
20455	ML-162	19288	(1S,3R)-RSL3

Class III FIN

This inducer negatively regulates GPX4 protein levels and activates squalene synthase (SQS).

Item No.	Product Name
25180	FIN56

Class IV FINs

These endoperoxides trigger ferroptosis by oxidizing Fe²⁺, which promotes lipid ROS.

Item No.	Product Name
11816	Artemisinin
11817	Artesunate
28788	Chlorido[N,N'-disalicylidene-1,2-phenylenediamine] iron(III)
25096	FINO ₂

GSH Depleters & Redox Modulators

These compounds decrease intracellular GSH levels and increase the accumulation of ROS.

Item No.	Product Name
10024	Acetaminophen
14484	L-Buthionine-(S,R)-Sulfoximine (BSO)
16115	N-Acetyl-4-benzoquinone imine (NAPQI)
31769	QD-394

FSP1 Inhibitor

Inhibition of FSP1 prevents the reduction of CoQ₁₀, preventing its antioxidant function.

Item No.	Product Name
29483	iFSP1

Iron Oxidation

Iron is transported into the cell through the transferrin receptor. Increased iron uptake contributes to ROS and oxidized lipid production.

Item No.	Product Name
32030	Transferrin (human, recombinant)
32031	Transferrin Receptor/CD71 Extracellular Domain (human, recombinant)
32311	Transferrin Receptor/CD71 Rabbit Monoclonal Antibody

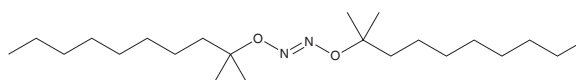
Fluorescent Iron Indicators

Item No.	Product Name
25393	Phen Green SK diacetate
31095	Rhodamine dithenoyl hydrazide

FEATURED PRODUCT

DTUN - Item No. 32742

Lipophilic radical initiator used to develop ferroptosis inhibitors and study antioxidants in lipid membranes.



Ferroptosis Inhibitors

Radical-Trapping Antioxidants

Antioxidants protect phospholipids from peroxidation by terminating radical-driven propagation.

Item No.	Product Name
89910	BHT
11506	Coenzyme Q ₁₀
17122	Cu-ATSM
70530	Ebselen
17729	Ferrostatin-1
15475	Idebenone
17730	Liproxstatin-1
31407	RC363
31408	RC574
25689	SRS11-92
26752	SRS16-86
81880	tetrahydro-L-Biopterin (hydrochloride)
25985	(±)- α -Tocopherol
10011659	Trolox
26525	UAMC-3203
26819	Vatiquinone

MDM2/MDMX Inhibitors

These compounds prevent the MDM2/MDMX complex from reducing expression of FSP1.

Item No.	Product Name
18585	(-)-Nutlin-3
27949	NSC 207895

PPAR α Activators

The activation of PPAR α enhances the expression of FSP1.

Item No.	Product Name
10009145	Bezafibrate
18515	Ciprofibrate
10005368	Fenofibrate
10011211	GW 9578

See all PPAR α activators at www.caymanchem.com

Iron Chelators

Iron chelation removes excess iron, preventing the formation of highly reactive hydroxyl radicals.

Item No.	Product Name
16021	Ciclopirox
30833	CN128
33318	CP21
16753	Deferasirox
20387	Deferiprone
14595	Deferoxamine (mesylate) (DFO)
20936	Dp44mT

ACSL4 Inhibitor

Inhibiting PUFA remodeling enzymes such as ACSL4 can prevent the enrichment of fatty acids in membrane phospholipids.

Item No.	Product Name
32748	PRGL493

15-LO Inhibitors

Inhibiting cellular lipoxygenases such as 15-LO can prevent the oxidation of fatty acids enriched in membrane phospholipids.

Item No.	Product Name
27391	BLX3887
70300	Nordihydroguaiaretic Acid
10010518	PD 146176

See all lipoxygenase inhibitors at www.caymanchem.com

Lipoxygenases & Inhibitor Screening Assay

Item No.	Product Name
60402	5-Lipoxygenase (human, recombinant)
10341	12-Lipoxygenase (platelet-type, mouse recombinant)
10011263	15-Lipoxygenase-2 (human, recombinant)
760700	Lipoxygenase Inhibitor Screening Assay Kit

Lipid ROS Detection

Cayman provides several convenient methods to detect the presence of lipid ROS. This includes assays for direct quantification of lipid hydroperoxides as well as assays that quantify end product reactive aldehydes, such as malondialdehyde or 4-hydroxy nonenal (4-HNE).

Lipid ROS Assay Kits

Item No.	Product Name	Mode of Action
501140	DHN-MA EIA Kit	Measures a metabolite of 4-HNE, a byproduct of lipid peroxidation
705002	Lipid Hydroperoxide (LPO) Assay Kit	Measures hydroperoxides directly using the redox reactions with ferrous ions
601290	ROS Detection Cell-Based Assay Kit (DHE)	Measures superoxide and hydrogen peroxide levels in living cells
10009055	TBARS Assay Kit	Measures malondialdehyde, a byproduct of lipid peroxidation

Lipid ROS Probes

Item No.	Product Name	Description
27086	C11 BODIPY 581/591	Lipid-soluble ratiometric fluorescent indicator of lipid oxidation
62237	DPPP	Fluorescent probe for detection of hydroperoxides

Lipid Peroxidation End Products

Item No.	Product Name	Description
10004413	4-hydroperoxy 2-Nonenal	The hydroperoxide precursor of 4-HNE
32100	4-hydroxy Nonenal	A lipid peroxidation product used as a marker of lipid peroxidation
10185	4-oxo-2-Nonenal	A more recently identified product of lipid peroxidation
10627	4-hydroxy Nonenal Glutathione (trifluoroacetate salt)	A major adduct formed by the reaction of 4-HNE with GSH; prevents the formation of DNA adducts by trapping of 4-HNE
32110	4-hydroxy Nonenal Mercapturic Acid	A urinary metabolite of 4-HNE

Oxidized Phospholipids

Item No.	Product Name
24383	1-Palmitoyl-2-(±)17(18)-EpETE- <i>sn</i> -glycero-3-PC
62924	PAz-PC
10044	PGPC
25746	PGPC-d ₆
10031	POV-PC

Item No.	Product Name
21138	1-Stearoyl-2-15(S)-HETE- <i>sn</i> -glycero-3-PC
21139	1-Stearoyl-2-15(S)-HETE- <i>sn</i> -glycero-3-PE
26531	1-Stearoyl-2-15(S)-HpETE- <i>sn</i> -glycero-3-PC
25856	1-Stearoyl-2-15(S)-HpETE- <i>sn</i> -glycero-3-PE

OXIDIZED PHOSPHOLIPID LIPIDOMIC SERVICES

Cayman's scientific staff has decades of industry expertise in assay and methods development, sample preparation, and analysis. Our targeted panel of phospholipids containing oxidized acyl chains (e.g., 20:4-OH, 20:4-OOH) will help identify hydroperoxy and hydroxy phospholipids in your samples. A recent publication using our method reports that increased oxidized lipids in tumor cells leads to ferroptosis and with immunotherapy is linked to cancer cell death (*Nature* **569(7755)**, 270-274 (2019)).

Visit www.caymanchem.com/lipidomics to learn more.