COMPOSITIONS AND METHODS FOR THE INHIBITION OF FERROPTOSIS SUPPRESSOR PROTEIN 1

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20250161297	05/22/2025	2022-061

BRIEF DESCRIPTION

Researchers at UC Berkeley have developed ferroptosis suppressor protein 1 (FSP1) inhibitors and methods for their use in cancer therapy.

Ferroptosis is an iron-dependent, non-apoptotic form of regulated cell death that is characterized by the accumulation of oxidatively damaged phospholipids. Ferroptosis has been implicated in cell death and dysfunction in degenerative diseases. Triggering ferroptosis by inhibition of the GSH-GPX4 pathway has emerged as a promising strategy to trigger cell death in cancer. However, recent findings have uncovered protective mechanisms that promote resistance to ferroptosis inducing agents in cancer cells. For example, FSP1 mediates a GSH-independent ferroptosis suppression pathway and has emerged as a key ferroptosis resistance factor. Thus, a need exists for FSP1 inhibitors and their use in cancer therapy.

Stage of Research

The inventors have developed FSP1 inhibitors and methods of inhibiting FSP1 comprised of contacting FSP1 with an FSP1 inhibitor in an amount effective to inhibit FSP1. The inventors have also developed methods for treating cancer wherein a subject is treated with a therapeutically effective amount of an FSP1 inhibitor, sometimes in a combination therapy regime.

SUGGESTED USES

The FSP1 inhibitors disclosed herein can be used for treating various cancers in a subject; in some cases the cancer expresses FSP1, in some cases the cancer is GPX4-inhibitor resistant, and in some cases the cancer is ferroptosis-resistant.

The use of FSP1 inhibitor in combination therapy with other inhibitors of the GSH-GPX4 pathway.

ADVANTAGES

Targeting ferroptosis has emerged as a promising strategy to trigger cell health in cancer, particularly in drug-resistant persistent cancer cells that give rise to relapse, as well as a variety of difficult to treat cancers such as pancreatic ductal adenocarcinoma and MYCN-amplified neuroblastoma.

It is likely that FSP1 inhibition will sensitize cancer cells to standard of care treatment that trigger ROS generation and ferroptosis, such as radiotherapy, photodynamic therapy, and immunotherapy.

RELATED MATERIALS

» Identification of structurally diverse FSP1 inhibitors that sensitize cancer cells to ferroptosis. Hendricks, J.M., Olzmann, J.A., et al., Cell Chemical Biology. (2023) 4;S2451-9456(23)00114-9. - 05/04/2023

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OTHER INFORMATION

KEYWORDS

Ferroptosis, FSP1, Cancer

CATEGORIZED AS

» **Medical**

» Disease: Cancer

» Therapeutics

RELATED CASES

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