

Product Data Sheet

Product Name: γ -Oryzanol

Cat. No.: GC31365

Chemical Properties

Cas. No. 11042-64-1

SMILES C[C@@H]([C@@]1([H])CC[C@]2(C)[C@]1(C)CCC3C2CCC5[C@@]3(CC[C@H](OC(=C/C6=CC(OC)=C(O)C=C6)=O)C5(C)C)C4)CC/C=C(C)\C

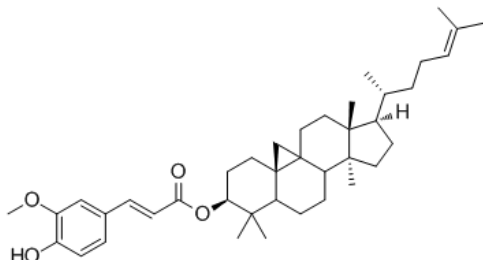
Formula $C_{40}H_{58}O_4$ M.Wt 602.89

Solubility DMSO : 62.5 mg/mL (103.67 mM); Water : < 0.1 mg/mL (insoluble) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Caution: Product has not been fully validated for medical applications. For research use only.

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Kinase experiment: To assess the inhibitory activity of each compound on DNA methylation, the formation of S-adenosyl-L-homocysteine (SAH) is measured in the presence of each compound (20 μ M for screening assays), S-adenosyl methionine (SAM; 10 μ M) and DNMT substrate (4 ng/ μ L) at 37°C for 90 min. To evaluate the Michaelis-Menten kinetics, DNMT1 (20 μ M) is incubated with γ -Oryzanol, SAM (5 μ M) and the indicated concentration of poly dI-dC at 37°C for 90 min. DNMT3a (100 μ M) and DNMT3b (100 μ M) are incubated with γ -Oryzanol, SAM (5 μ M) and the indicated concentration of poly dG-dC at 37°C for 120 min. The assays are performed in quadruplicate. Extracted protein (0.75 mg/mL) is incubated with SAM (5 μ M), poly dI-dC (5 μ g/mL), and poly dG-dC (5 μ g/mL) at 40°C for 120 min, and SAH formation is measured[1].

Animal experiment: Mice[1] Seven-week-old male C57BL/6J mice are used. To evaluate the preference for the HFD, γ -Oryzanol is administered to 8-week-old mice by gavage during the food choice test. For the other experiments, an HFD containing 0.4% γ -Oryzanol is manufactured as pellets. After 12 weeks of feeding, tissue is collected from the striatum and hypothalamus. The daily intake of γ -Oryzanol, estimated from the mean food intake of the mice, is approximately 320 μ g/g body weight. The doses of γ -Oryzanol are determined.

References:

[1]. Kozuka C, et al. Impact of brown rice-specific γ -oryzanol on epigenetic modulation of dopamine D2 receptors in brain striatum in high-fat-diet-induced obesity in mice. Diabetologia. 2017 Aug;60(8):1502-1511.

Background

γ -Oryzanol is a potent DNA methyltransferases (DNMTs) inhibitor in the striatum of mice. γ -Oryzanol significantly inhibits the activities of DNMT1 (IC_{50} =3.2 μ M), DNMT3a (IC_{50} =22.3 μ M).

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and DNMT 3b (maximum inhibition 57%). In contrast, the inhibitory activity of Ferulic acid, a metabolite of γ -Oryzanol, is much lower than that of γ -Oryzanol. Furthermore, γ -Oryzanol acts as a partial antagonist against ERR γ , which primarily serves as a positive regulator for DNMT1 production, and consequently decreased the activity of DNMT1[1].

The brown rice-specific bioactive component γ -Oryzanol, a mixture of ferulic acid ester and several phytosterols, attenuates the preference for dietary fat via a decrease in hypothalamic endoplasmic reticulum (ER) stress. γ -Oryzanol ameliorates HFD-induced DNA hypermethylation of the promoter region of D2R in the striatum of mice. γ -Oryzanol might regulate levels of DNMTs in a striatum-specific manner. γ -Oryzanol partially decreases ERR γ activity (an approximately 40% reduction of the innate value). Oral administration of γ -Oryzanol to male mice by gavage significantly attenuates the preference for an HFD (93% of the values for vehicle-treated mice), resulting in an apparent attenuation of body weight gain[1].

[1]. Kozuka C, et al. Impact of brown rice-specific γ -oryzanol on epigenetic modulation of dopamine D2 receptors in brain striatum in high-fat-diet-induced obesity in mice. Diabetologia. 2017 Aug;60(8):1502-1511.

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