Small Molecules

Fisetin

Sirtuin 1 activator

Catalog #100-1126

1 g

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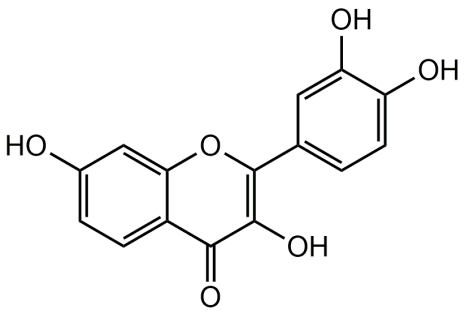
Product Description

Fisetin is a flavonoid found in plants and vegetables with senolytic activities (Yousefzadeh et al.). Fisetin upregulates the expression of sirtuin 1 (SIRT1), which is a member of the sirtuins superfamily histone deacetylases (HDAC) that helps inhibit many transcription factors, such as p53, nuclear factor kappa B (NF-κB), and forkhead box O (FOXO) (Ayissi et al.). Fisetin inhibits DNA methyltransferase 1 (DNMT1)-mediated DNA methylation (IC_{50} = 3.5 µM) through direct inhibition of the DNA methylase (Lee et al.).

Alternative Names:	CI-75620; NSC 407010; NSC 656275
CAS Number:	528-48-3
Chemical Formula:	$C_{15}H_{10}O_6$
Molecular Weight:	286.2 g/mol
Purity:	≥ 90%
Chemical Name:	2-(3,4-dihydroxyphenyl)-3,7-dihydroxy-4H-1-benzopyran-4-one
Structure:	



Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. As a precaution, STEMCELL recommends storing all small molecules away from direct light. For long-term storage, store with a desiccant. Stable as supplied for 12 months from date of receipt.
Solubility:	• DMSO ≤ 100 mM • Absolute ethanol ≤ 17 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 3.49 mL of DMSO. Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported; however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application. Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO or absolute ethanol concentration above 0.1% due to potential cell toxicity.

Published Applications

MAINTENANCE AND SELF-RENEWAL

· Enhances survival of PC12 cells from tunicamycin (Tm)-mediated cell death by mitigating apoptosis, autophagy, and reactive oxygen species (ROS) production (Yen et al.).

IMMUNOLOGY

· Downregulates phorbol-12-myristate 13-acetate plus calcium ionophore A23187 (PMACI)-stimulated gene expression and production of tumor necrosis factor-α (TNF-α), interleukin (IL)-1β, IL-4, IL-6, and IL-8 in human mast cells (Park et al.).

CANCER RESEARCH

· Inhibits the PI3K/Akt and mTOR pathway in prostate, lung, myeloma, and melanoma cancer cells (Adhami et al.; Syed et al.).

· Known to possess antioxidant activity. Mechanistically, fisetin has been shown to attenuate H_2O_2-induced cell damage by scavenging ROS and activating GSH pathways in vitro (Kang et al.; Zhang et al.)

DISEASE MODELING

· Induces ERK activation which provides neuroprotective activities in Huntington's disease models (Maher et al.).

· Reduces senescence and age-related pathologies in yeast, simple eukaryotes, and mice (Grynkiewicz and Demchuk; Wood et al.; Yousefzadeh et al.).

References

Adhami VM et al. (2012) Dietary flavonoid fisetin: a novel dual inhibitor of PI3K/Akt and mTOR for prostate cancer management. Biochem Pharmacol 84(10): 1277–81.

Ayissi VBO et al. (2014) Epigenetic effects of natural polyphenols: A focus on SIRT1-mediated mechanisms. Mol Nutr Food Res 58(1): 22–32.

Grynkiewicz G and Demchuk OM. (2019) New perspectives for fisetin. Front Chem 7: 697.

Kang KA et al. (2014) Fisetin attenuates hydrogen peroxide-induced cell damage by scavenging reactive oxygen species and activating protective functions of cellular glutathione system. Vitr Cell Dev Biol - Anim 50(1): 66–74.

Lee WJ et al. (2005) Mechanisms for the inhibition of DNA methyltransferases by tea catechins and bioflavonoids. Mol Pharmacol 68(4): 1018–30.

Maher P et al. (2011) ERK activation by the polyphenols fisetin and resveratrol provides neuroprotection in multiple models of Huntington's disease. Hum Mol Genet 20(2): 261–70.

Park H-H et al. (2007) Anti-inflammatory activity of fisetin in human mast cells (HMC-1). Pharmacol Res 55(1): 31–7.

Syed D et al. (2013) Inhibition of Akt/mTOR Signaling by the dietary flavonoid fisetin. Anticancer Agents Med Chem 13(7): 995–1001.

Wood JG et al. (2004) Sirtuin activators mimic caloric restriction and delay ageing in metazoans. Nature 430(7000): 686–9.

Yen J-H et al. (2017) Fisetin protects PC12 cells from tunicamycin-mediated cell death via reactive oxygen species scavenging and modulation of Nrf2-driven gene expression, SIRT1 and MAPK signaling in PC12 cells. Int J Mol Sci 18(4): 852.

Yousefzadeh MJ et al. (2018) Fisetin is a senotherapeutic that extends health and lifespan. EBioMedicine 36: 18–28.

Zhang H et al. (2019) Nrf2–ARE signaling acts as master pathway for the cellular antioxidant activity of fisetin. Molecules 24(4): 708.

Related Small Molecules

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