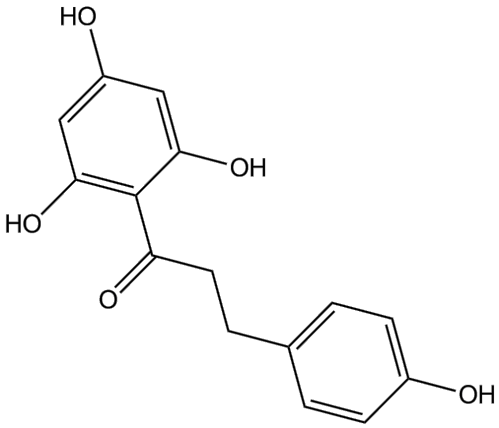
Product Data Sheet

Product Name: Phloretin
Cat. No.: GC17976

Chemical Properties

Cas. No.	60-82-2		
Chemical Name	3-(4-hydroxyphenyl)-1-(2,4,6-trihydroxyphenyl)propan-1-one		
SMILES	O=C(C1=C(O)C=C(O)C=C1O)CCC2=CC=C(O)C=C2		
Formula	$C_{15}H_{14}O_5$	M.Wt	274.27
Solubility	≥ 105 mg/mL in DMSO, ≥ 87.6 mg/mL in EtOH	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ 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

Cell experiment [1]:

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Cell lines	U87 and U251 cell lines
Preparation method	The solubility of this compound in DMSO is >9.25mg/mL. General tips for obtaining a higher concentration: Please warm the tube at 37℃ for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20℃ for several months.
Reacting condition	0-300 μM; 12, 24, and 48 h; 37°C
Applications	In U87 and U251 cell lines, Phloretin inhibited colony formation in a concentration-dependent manner. Phloretin also inhibited cell growth in a concentration- and time-dependent way. In U87 cells, Phloretin induced cell cycle arrest at the G0-G1 phase and significantly induced apoptosis. Phloretin also triggered the mitochondrial apoptosis pathway and generated reactive oxygen species (ROS).

Animal experiment [2]:

Animal models	ovalbumin (OVA)-induced asthmatic mice
Dosage form	5, 10, or 20 mg/kg; intraperitoneally injection
Application	In ovalbumin (OVA)-induced asthmatic mice, Phloretin (PT) could significantly diminish airway hyperresponsiveness (AHR). Phloretin significantly reduced numbers of eosinophils and total cells in bronchoalveolar lavage fluid (BalF). Phloretin also decreased malondialdehyde levels in the lung and reduced Th2 cytokine production in bronchoalveolar lavage fluids.

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Other notes	Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

References:

[1]. Huang WC1, Fang LW2, Liou CJ3, et al. Phloretin Attenuates Allergic Airway Inflammation and Oxidative Stress in Asthmatic Mice. Front Immunol. 2017 Feb 13;8:134.

[2] Najafian M, Jahromi M Z, Nowroznejhad M J, Phloridzin reduces blood glucose levels and improves lipids metabolism in streptozotocin-induced diabetic rats. Mol Biol Rep. 2012, 39(5): 5299-306.

Background

Phloretin is a dihydrochalcone, a type of natural phenols which can be found in apple tree leaves and Manchurian apricot. Phloretin inhibits the active transport of glucose into cells via sodium-glucose linked transporter (SGLT) 1 and 2 with IC50 value of 49±12 μM [2].

SGLTs are a family of glucose transporter which is found in the small intestine mucosa (SGLT 1) and nephron proximal tubule (SGLT 2). They contribute to the renal glucose reabsorption.

After treatment of phloretin, differentiated 3T3-L1 cells exhibited significantly enhanced glycerol and the inhibition of adipogenesis-related transcription factor that were regulated by SGLTs. Additionally, phloretin promoted phosphorylation of AMP-activated protein kinase and increased activity of adipose triglyceride lipase and hormone-sensitive lipase [1]. When RAW 263.7 cells were cultured from differentiated 3T3-L1 cell media, PT suppressed the SGLT-associated nuclear transcription factor kappaB and mitogen-activated protein kinase pathways [1].

In streptozotocin-induced rat model of diabetes type I, oral administration of phloridzin (5/10/20/40 mg/kg/day) resulted in significant reduction of blood glucose levels and

improved dyslipidemia. Additionally, Administration of phloridzin reduced urine volume and water intake in a dose-dependent manner [3].

References:

[1] Huang W C et al. , Phloretin and phlorizin promote lipolysis and inhibit inflammation in mouse 3T3-L1 cells and in macrophage-adipocyte co-cultures. Mol Nutr Food Res. 2013, 57: 1807-1817.
[2] Kasahara T, Kasahara M. Expression of the rat GLUT1 glucose transporter in the yeast Saccharomyces cerevisiae. Biochem J. 1996, 315 (Pt 1):177-182.
[3] Najafian M, Jahromi M Z, Nowroznejhad M J, Phloridzin reduces blood glucose levels and improves lipids metabolism in streptozotocin-induced diabetic rats. Mol Biol Rep. 2012, 39(5): 5299-306.