Apocynin

Cat. No.: HY-N0088

CAS No.: 498-02-2

Molecular Formula: $C_9H_{10}O_3$

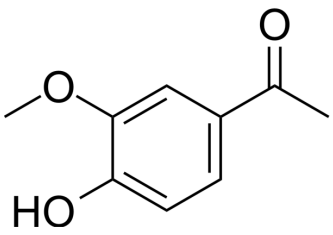
Molecular Weight: 166.17

Target: NADPH Oxidase

Pathway: Metabolic Enzyme/Protease

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (601.79 mM)

H_2O : 3.33 mg/mL (20.04 mM; ultrasonic and warming and heat to 60°C)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	6.0179 mL	30.0897 mL	60.1793 mL
5 mM	1.2036 mL	6.0179 mL	12.0359 mL
10 mM	0.6018 mL	3.0090 mL	6.0179 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (15.04 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (15.04 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (15.04 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Apocynin is a selective NADPH-oxidase inhibitor with an IC_{50} of 10 μM[1][2]. Apocynin improves acute lung inflammation in Carrageenan (HY-125474)-induced pleurisy mice model[3]. Apocynin can also be used for cancer research[4]. Apocynin reverses the aging process in mesenchymal stem cells to promote osteogenesis and increases bone mass[5].

In Vitro

Apocynin (100 μM; 1-7, 14 days) shows a significant increase in the expression level of an osteogenic marker in the aging

BMSCs after osteogenic induction[3].
Apocynin (1, 10, 100 μM, 0-48h) has selective inhibition the proliferation and adhesion to fibronectin of v-H-ras-transformed 3Y1 cells[4].
Apocynin (1, 10, 100 μM; 3, 6, 12 h) decreases the intracellular reactive oxygen species (ROS) level in HR-3Y1-2 but not 3Y1 cells. [4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis[3]

Cell Line:	Bone marrow stromal cells (BMSCs)
Concentration:	100 μM
Incubation Time:	1-7,14 days
Result:	Increased the expression levels of the “stemness markers” Nanog and Oct-4. Decreased the expression levels of p53, p21 and p16 at both the mRNA level and protein level. Increased the expression of sox-2 and klf-4 by 82.4% and 38.7%, respectively, compared with the negative control group. Reduced the expression of NADPH oxidase by 66.5% compared with the negative control. Had no change in the cell cycle or proliferation. Ddecreased the percentage of SA-β –gal-positive (green-stained) cells was by 42.5%. Increased the expression levels of four pivotal osteogenic markers (Runx2, OSX, Ocn, and Col1).

Cell Proliferation Assay[4]

Cell Line:	HR-3Y1-2, 3Y1 cells
Concentration:	0, 1, 10, or 100 μM
Incubation Time:	48h
Result:	Inhibited the proliferation of HR-3Y1-2 but not 3Y1 cells at 10μM and 100μM.

RT-PCR[3]

Cell Line:	HR-3Y1-2, 3Y1 cells
Concentration:	0, 1, 10, or 100 μM
Incubation Time:	24, 36, 48 h
Result:	Selectively down-regulated 1-integrin cell surface expression on the HR-3Y1-2 cells. Decreased adhesion of HR-3Y1-2 cells to fibronectin-coated plates.

In Vivo

Apocynin (0.1 mg/kg/day, i.p., three times per week for 3 months) increases bone mineral density and total bone volume in SAMP6 mice[3].
Apocynin (5 mg/kg, i.p.) reduces the degree of lung injury and attenuates the degree of acute inflammation in the Carrageenan (HY-125474)-induced pleurisy mice[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	SAMP6 mouse model (Pharmacokinetic assay)[3]
Dosage:	0.1 mg/kg/day

Administration:	Intraperitoneal injection (i.p.), three times per week, for 3 months
Result:	Showed a higher bone value and exhibited a lower percentage of SA-β -gal positive cells than the control group. Increased the expression of Ki67 and Oct-4 mRNA. Altered the osteoblast-osteoclast balance in bone and promoted the activity of osteoblasts.

Animal Model:	Carrageenan (HY-125474)-induced pleurisy in male adult CD1 mice [5]
Dosage:	5 mg/kg
Administration:	Intraperitoneal injection (i.p.)
Result:	Blocked NADPH oxidase activation and attenuated neutrophil infiltration and lipid peroxidation in the lung tissue. Reduced the degree of PARP activation and the degree of IL-1b expression. Prevented carrageenan-induced IkB-a degradation and reduced the levels of NF-kB p65. Attenuated this iNOS expression,reduced the degree of positive staining for Fas ligand in the lung tissues. Inhibited cells apoptosis in carrageenan-treated mice. Prevented Bax expression and reduced the degree of positive staining for Bax. Attenuated carrageenan-induced inhibition of Bcl-2 expression and the loss of positive staining for Bcl-2 in mice subjected to carrageenan-induced pleurisy. Reduced the level of pERK1/2 and p38 expression.

CUSTOMER VALIDATION

- Exp Mol Med. 2021 Sep;53(9):1307-1318.
- Redox Biol. 2018 May;15:418-434.
- Pharmacol Res. 2023 Nov 21:107009.
- Biomed Pharmacother. 2022 Jul;151:113098.
- Biomed Pharmacother. 2020 Jan;121:109615.

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REFERENCES

[1]. Sun J, et.al. Apocynin suppression of NADPH oxidase reverses the aging process in mesenchymal stem cells to promote osteogenesis and increase bone mass. Sci Rep. 2015 Dec 21;5:18572.

[2]. Yamasaki M, et.al. Selective inhibition by apocynin of the proliferation and adhesion to fibronectin of v-H-ras-transformed 3Y1 cells. Biosci Biotechnol Biochem. 2012;76(6):1177-81.

[3]. Impellizzeri D et al. Effect of apocynin, a NADPH oxidase inhibitor, on acute lung inflammation. Biochem Pharmacol. 2011 Mar 1;81(5):636-48.

[4]. Stolk J,et al. Am J Respir Cell Mol Biol, 1994, 11(1), 95-102.

[5]. Stefanska J, et al. Mediators Inflamm, 2008, 106507.

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

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