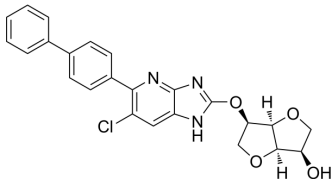
MK8722

Cat. No.:	HY-111363
CAS No.:	1394371-71-1
Molecular Formula:	$C_{24}H_{20}ClN_3O_4$
Molecular Weight:	449.89
Target:	AMPK
Pathway:	Epigenetics; PI3K/Akt/mTOR
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 : 31.25 mg/mL (69.46 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.2228 mL	11.1138 mL	22.2277 mL
	5 mM	0.4446 mL	2.2228 mL	4.4455 mL
	10 mM	0.2223 mL	1.1114 mL	2.2228 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: 2.08 mg/mL (4.62 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.62 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.62 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

MK8722 is a potent and systemic pan-AMPK activator.

IC_{50} & Target

AMPK

In Vitro

MK8722 (MK-8722) is a potent, direct, allosteric activator of all 12 mammalian AMPK complexes. MK8722 activates pAMPK complexes with increased potency and magnitude versus AMP, with EC_{50} values of ~1 to 60 nM and increased activation by factors of ~4 to 24. Although MK8722 exhibits higher affinity for β1-containing (~1 to 6 nM) versus β2-containing (~15 to 63

	nM) pAMPK complexes, it is the most potent activator of β2 complexes reported to date. pAMPK activation by maximal AMP plus MK8722 is synergistic, demonstrating that the agents act at distinct sites[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Chronic antihyperglycemic efficacy of MK8722 (MK-8722) is evaluated in db/db mice, a leptin receptor-deficient T2DM model. Once-daily administration of MK8722 results in dose-dependent lowering of ambient blood glucose. On treatment day 12, glucose reductions after MK8722 treatment (30 mpk/day) are comparable to those observed with the PPARγ agonist BRL49653 (3 mpk/day). Unlike BRL49653, the glucose-lowering action of MK8722 manifests without significant effects on body weight, which is a consistent finding. Dose-dependent increases in tissue pACC are maintained throughout the dosing period. Chronic efficacy, without tachyphylaxis, is also observed in additional dysmetabolic and diabetic rodent models. In all cases, efficacy is associated with trough MK8722 plasma levels comparable to the concentrations required to acutely stimulate skeletal muscle glucose uptake. Chronic MK8722 dosing in mice also increases muscle Glut4 protein levels, possibly contributing to efficacy[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [1]	Mice[1] Housing Lean C57BL/6 mice at 10-12 weeks of age and C57BL/6 eDIO mice at 16 weeks of age are used. ***db/db*** mice at 7 weeks of age are used. Animals are maintained on a 12 hr/12 hr light-dark cycle with free access to food and water with the temperature maintained at 22°C. Four lean C57BL/6 mice are housed in a standard cage. eDIO mice are individually caged. Eight db/db mice are housed in a large rodent cage. C57BL/6 mice and db/db mice are maintained on regular rodent chow diet 7012 (5% dietary fat; 3.75 kcal/g) for 1-2 weeks before receiving compound treatments. eDIO mice are maintained on 60% kcal% fat diet. Oral dosing of MK8722 in standard vehicle, or vehicle alone, is performed using 10 mL/kg body weight. The effect of MK8722 on various metabolic parameters is established by comparison to vehicle treated animals[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Cell Biol. 2023 Jun;25(6):836-847.
- Nat Commun. 2023 May 24;14(1):2994.
- Mol Cell. 2021 Feb 4;81(3):629-637.e5.
- Autophagy. 2021 Mar 28;1-18.
- Biochem Pharmacol. 2021 Jan;183:114337.

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REFERENCES

[1]. Myers RW, et al. Systemic pan-AMPK activator MK-8722 improves glucose homeostasis but induces cardiachypertrophy. Science. 2017 Aug 4;357(6350):507-511.

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

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