# AK-7

**Cat. No.:** HY-16691

**CAS No.:** 420831-40-9

**Molecular Formula:** $C_{19}H_{21}BrN_2O_3S$

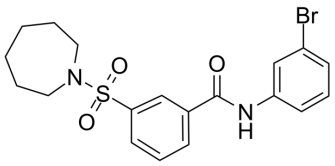
**Molecular Weight:** 437.35

**Target:** Sirtuin

**Pathway:** Cell Cycle/DNA Damage; Epigenetics

**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 : ≥ 50 mg/mL (114.32 mM)

$H_2O$ : < 0.1 mg/mL (insoluble)

* "≥" means soluble, but saturation unknown.

**Preparing Stock Solutions**

| Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 2.2865 mL | 11.4325 mL | 22.8650 mL |
| 5 mM | 0.4573 mL | 2.2865 mL | 4.5730 mL |
| 10 mM | 0.2286 mL | 1.1432 mL | 2.2865 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 (5.72 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (5.72 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

AK-7 is a selective cell- and brain-permeable SIRT2 inhibitor, with an $IC_{50}$ of 15.5 μM.

**$IC_{50}$ & Target**

SIRT2

15.5 μM ($IC_{50}$)

**In Vitro**

AK-7 (10 μM) reduces cholesterol levels in naive N2a neuroblastoma cells and hippocampal slice cultures from wild-type mice. AK-7 (1 μM) shows neuroprotective effect of AK-7 in striatal Huntington's disease (HD) neurons[1]. AK-7 (12.5 μM) decreases ratio of DA neurons in primary midbrain cultures[3].

| | |
|---|---|
| | MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | AK-7 (15 mg/kg/dose, i.p.) is brain-permeable in wild-type and HD mice[1]. AK-7 (10, 20 mg/kg, i.p.) improves the behavior and neuropathological phenotype and extends survival of R6/2 HD mice. AK-7 (20 mg/kg) ameliorates HD neuropathology in R6/2 mice. AK-7 also reduces the polyglutamine aggregation in R6/2 brain. In addition, AK-7 treated 140CAG mice show motor performance changes that parallel untreated wild-type mice, with the 20 mg/kg dose being most effective and significantly different from untreated 140CAG mice[2].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## PROTOCOL

| | |
|---|---|
| **Cell Assay** [1] | Neuronal nuclear antigen (NeuN)-positive neurons and some astroglia are derived from mechanically dissociated ganglionic eminences of E16 rat embryos. The HD model is based on the expression of mutant huntingtin. Treatments of cultures with AK-7 are at 10 μM for 24 h unless stated otherwise. DMSO is included at the same concentrations as a control. Lower dose, chronic treatments with AK-7 are introduced to neurons at DIV4 and continued weekly coinciding with normal medium change[1].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **Animal Administration** [1] | AK-7, solubilized at 1.5 mg/mL in 25% Cremophor EL (BASF)/ 10% DMSO in water, is administered by intraperitoneal injection to 11 week old mice at 15 mg/kg/dose, and compound levels in serum and brain are measured following sacrifice. Blood is collected and centrifuged at 7,000 rpm for 7 min, and then serum is aspirated and immediately frozen in liquid nitrogen. Brains are immediately frozen in liquid nitrogen and stored at −80°C. Brains are weighed and then homogenized in four volumes of 10% Cremophor RH40 in water using a Polytron homogenizer, and 2% v/v phosphoric acid is added to the homogenate, vortexed, and centrifuged at 10,000 g at 25°C for 1 h. The supernatant is aspirated, and solid phase extraction is performed immediately. Serum samples are vortexed into 2% v/v phosphoric acid and centrifuged at 2500 rpm for 10 min [1].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## CUSTOMER VALIDATION

- Aging Cell. 2020 Aug;19(8):e13194.

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## REFERENCES

[1]. Taylor DM, et al. A brain-permeable small molecule reduces neuronal cholesterol by inhibiting activity of sirtuin 2 deacetylase. ACS Chem Biol. 2011 Jun 17;6(6):540-6.

[2]. Chopra V, et al. The sirtuin 2 inhibitor AK-7 is neuroprotective in Huntington's disease mouse models. Cell Rep. 2012 Dec 27;2(6):1492-7.

[3]. Szego EM, et al. Sirtuin 2 enhances dopaminergic differentiation via the AKT/GSK-3β/β-catenin pathway. Neurobiol Aging. 2017 Aug;56:7-16.



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