

Small Molecules

AK-7

Selective sirtuin 2 inhibitor

Catalog #100-1171

25 mg



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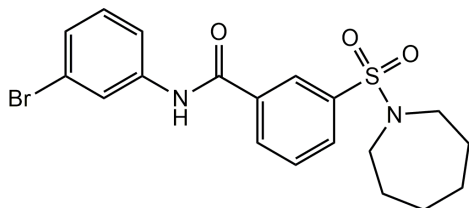
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Product Description

AK-7 is a neuroprotective agent and is a selective sirtuin 2 (SIRT2) inhibitor ($IC_{50} = 15.5 \mu\text{M}$; Chen et al.). It is inactive against SIRT1 and SIRT3 (Taylor et al.). SIRT2 is a deacetylase that targets histone 4, α -tubulin, forkhead transcription factors of class O (FOXO), and other protein substrates. SIRT2 activity regulates many cellular processes, therefore, SIRT2 has been connected to cancer, age-related disorders, and neurodegenerative diseases (de Oliveira et al.). As an inhibitor of SIRT2, AK-7 reduces neuronal death in Huntington's disease (HD) mouse models (Chopra et al.).

Alternative Names:	Not applicable
CAS Number:	420831-40-9
Chemical Formula:	$C_{19}H_{21}BrN_2O_3S$
Molecular Weight:	437.4 g/mol
Purity:	$\geq 98\%$
Chemical Name:	3-(1-Azepanylsulfonyl)-N-(3-bromophenyl)benzamide
Structure:	



Properties

Physical Appearance:	A white powder
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:	<ul style="list-style-type: none">• DMSO $\leq 110 \text{ mM}$• Absolute ethanol $\leq 18 \text{ mM}$ For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 2.29 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

DISEASE MODELING

- Protects against 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) neurotoxicity and α -Synuclein (aSyn) toxicity in Parkinson's disease mouse models (Chen et al.).
- Promotes neuronal survival in Huntington's disease mouse models (Chopra et al.).
- Improves the outcome of brain ischemia in mice. Enhances P38 activation levels in vitro and in vivo. Significantly decreases infarction volume as well as promotes the recovery of neurological function in mice evaluated in behavior tests (Wu et al.).
- Decreases cochlear cell apoptosis and attenuates noise-induced hearing loss. Reduces oxidative nuclear DNA damage and apoptosis in mouse cochlea following noise exposure. Also shown to reduce apoptosis of mouse inner ear HEI-OC1 cells exposed to oxidative stress in vitro (Liu et al.).

References

- Chen X et al. (2015) The sirtuin-2 inhibitor AK7 is neuroprotective in models of Parkinson's disease but not amyotrophic lateral sclerosis and cerebral ischemia. *PLoS One* 10(1): e0116919.
- Chopra V et al. (2012) The sirtuin 2 inhibitor AK-7 is neuroprotective in Huntington's disease mouse models. *Cell Rep* 2(6): 1492–7.
- de Oliveira RM et al. (2012) SIRT2 as a therapeutic target for age-related disorders. *Front Pharmacol* 3: 82.
- Liu Y et al. (2019) The SIRT2 inhibitor AK-7 decreases cochlear cell apoptosis and attenuates noise-induced hearing loss. *Biochem Biophys Res Commun* 509(3): 641–6.
- Taylor DM et al. (2011) A brain-permeable small molecule reduces neuronal cholesterol by inhibiting activity of sirtuin 2 deacetylase. *ACS Chem Biol* 6(6): 540–6.
- Wu D et al. (2018) Neuroprotective effect of Sirt2-specific inhibitor AK-7 against acute cerebral ischemia is P38 activation-dependent in mice. *Neuroscience* 374: 61–9.

Related Small Molecules

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