Product data sheet



MedKoo Cat#: 319851				
Name: Cutamesine HCl				
CAS#: 165377-44-6 (HCl)				
Chemical Formula: C ₂₃ H ₃₄ Cl ₂ N ₂ O ₂				
Molecular Weight: 441.437				
Product supplied as:	Powder			
Purity (by HPLC):	$\geq 98\%$			
Shipping conditions	Ambient temperature			
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.			
	In solvent: -80°C 3 months; -20°C 2 weeks.			



1. Product description:

Cutamesine, also known as SA-4503 and AGY94806, is a sigma-1 receptor agonist under development for recovery enhancement after acute ischemic stroke. Cutamesine protects against retinal cell death in vitro and in vivo by the agonistic effect of sigma-1 receptor. Therefore, sigma-1 receptor may have a potential as a therapeutic target in retinal diseases mediated by photoreceptor degeneration.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

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Solvent	Max Conc. mg/mL	Max Conc. mM		
DMSO	30	67.96		

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.27 mL	11.33 mL	22.65 mL
5 mM	0.45 mL	2.27 mL	4.53 mL
10 mM	0.23 mL	1.13 mL	2.27 mL
50 mM	0.05 mL	0.23 mL	0.45 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Shimazawa M, Sugitani S, Inoue Y, Tsuruma K, Hara H. Effect of a sigma-1 receptor agonist, cutamesine dihydrochloride (SA4503), on photoreceptor cell death against light-induced damage. Exp Eye Res. 2015 Mar;132:64-72. doi: 10.1016/j.exer.2015.01.017. Epub 2015 Jan 20. PMID: 25616094.

In vivo study

1. Shimazawa M, Sugitani S, Inoue Y, Tsuruma K, Hara H. Effect of a sigma-1 receptor agonist, cutamesine dihydrochloride (SA4503), on photoreceptor cell death against light-induced damage. Exp Eye Res. 2015 Mar;132:64-72. doi: 10.1016/j.exer.2015.01.017. Epub 2015 Jan 20. PMID: 25616094.

2. Qin J, Wang P, Li Y, Yao L, Liu Y, Yu T, Lin J, Fang X, Huang Z. Activation of Sigma-1 Receptor by Cutamesine Attenuates Neuronal Apoptosis by Inhibiting Endoplasmic Reticulum Stress and Mitochondrial Dysfunction in a Rat Model of Asphyxia Cardiac Arrest. Shock. 2019 Jan;51(1):105-113. doi: 10.1097/SHK.00000000001119. PMID: 29424796.

7. Bioactivity

Biological target:

Product data sheet



Cutamesine dihydrochloride (SA4503 dihydrochloride; AGY94806 dihydrochloride) is a potent Sigma 1 receptor agonist with an IC50 of 17.4 nM in guinea pig brain membranes.

In vitro activity

Cutamesine was examined to see whether it protected the 661W cells against light-induced cell death. Representative photographs of the Hoechst 33342 and PI staining of the 661W cells pretreated with cutamesine and/or BD-1047 are shown in Fig. 1A. Hoechst 33342 stains all cells (both live and dead), whereas PI stains only dead cells. Pretreatment with 10 μ M cutamesine protected against light-induced cell death (Fig. 1B), and the protective effect significantly disappeared after treatment with BD-1047, a sigma-1 receptor antagonist, at 1 μ M (Fig. 1C). To investigate the expression of sigma-1 receptor in 661W cells and the effect of cutamesine, western blot analysis was used. Sigma-1 receptor protein expressed in 661W cells, and the expression was significantly decreased by light exposure. Cutamesine at 10 μ M significantly prevented the decreased expression of sigma-1 receptor protein (Fig. 2).

Reference: Exp Eye Res. 2015 Mar;132:64-72. https://linkinghub.elsevier.com/retrieve/pii/S0014-4835(15)00024-X

In vivo activity

The effects of cutamesine on light-induced retinal dysfunction were examined by electrophysiological analysis. The a-wave shows the function of the photoreceptors and the b-wave reflects the function of bipolar cells and Müller cells (Fig. 5A). Amplitudes of the a- and b-waves were significantly reduced five days after 8000 lux light exposure for 3 h. The decreases in the a- and b-wave amplitudes were significantly recovered by intravitreal injection of cutamesine (50 or 500 μ M, 2 μ L) compared with the vehicle-treated group (Fig. 5B). Representative entire retinal images were obtained five days after light exposure for histological evaluation (Fig. 6A). The ONL was remarkably thinner in the light-irradiated retina than in the normal retina (Fig. 6A). Cutamesine prevented the damage induced by light exposure (Fig. 6B). The thickness of the ONL was measured in 240- μ m steps; the data were averaged and are shown in Fig. 6C. Cutamesine significantly protected the retinal damage in a dose-dependent manner. Furthermore, the protective effect of cutamesine (500 μ M, 2 μ L) on light-induced ONL thinning was significantly eliminated by co-administration with BD-1047 (500 μ M), a sima-1 receptor antagonist (Fig. 7). On the other hand, BD-1047 alone did not show any effects on the light damages.

Reference: Exp Eye Res. 2015 Mar;132:64-72. https://linkinghub.elsevier.com/retrieve/pii/S0014-4835(15)00024-X

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.