

Product Data Sheet

Product Name: Edaravone

Cat. No.: GC12838

Chemical Properties

Cas. No. 89-25-8

Chemical Name 5-methyl-2-phenyl-4H-pyrazol-3-one

SMILES CC1=NN(C(=O)C1)C2=CC=CC=C2

Formula $C_{10}H_{10}N_2O$ M.Wt 174.2

Solubility $\geq 6.45\text{mg/mL}$ in DMSO, ≥ 47.8 mg/mL in EtOH with ultrasonic Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

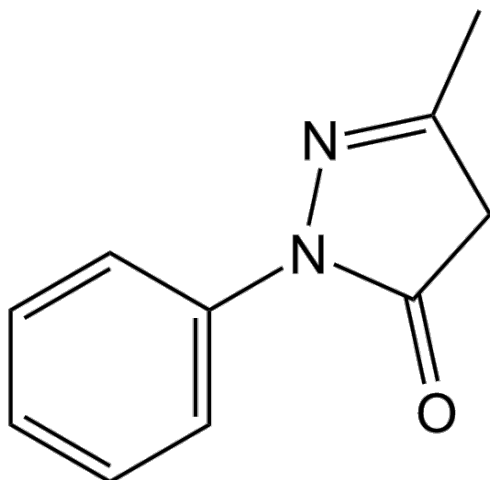
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Protocol

Cell experiment [1]:

Cell lines Spiral ganglion neurons (SGNs)

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Preparation Method	SGNs (1.0×10^5 /mL) subcultured in 96-well or 24-well plates were treated with 2mM glutamate for 10 minutes. Then the medium was replaced by normal DMEM. Different concentrations of Edaravone were added to the medium either 20min before or 2h, 6h, and 12h after glutamate treatment. Then the medium was changed to normal medium 10min after that. Cell viability was observed after normal culture for 24h.
Reaction Conditions	250, 500, and 750 μ M; 20min (for preventative effect), 22h, 18h, 12h (therapeutic effect)
Applications	Edaravone pretreatment reversed the glutamate-induced damage: Edaravone restored cell numbers, prevented widespread death, maintained the neurons' elongated spindle shape, and eliminated cellular debris. At 500 μ M and 750 μ M, SGNs grew normally with virtually no cell loss. 500 μ M Edaravone was added to the medium 2h, 6h, or 12h after glutamate treatment. Cell death decreased with the treatment of Edaravone. 2h after glutamate treatment or even an earlier time point was the most suitable time point for administering Edaravone to reach the maximal protection effect among these groups. At later time points, the cell death could not be reduced effectively.

Animal experiment [2]:

Animal models	Sprague-Dawley rats
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Adult male Sprague-Dawley rats weighing between 275 and 415g were randomly divided into the following two groups, with 10 animals in each group: middle cerebral artery occlusion (MCAO) treated with Edaravone and MCAO treated with physiological saline (controls; n=10). Rats in which MCAO was performed/rats with hyperglycemia, were administered Edaravone. Edaravone was dissolved in 1N NaOH, and the pH of the solution was adjusted to 7.0 using 1N HCl. Edaravone (3mg/kg) was IP injected immediately after occlusion, and the injection was repeated twice, once immediately following reperfusion and 1 hour after reperfusion.

Dosage form 3mg/kg; i.p.

Applications Edaravone significantly decreased infarct volume, with the average infarct volume in the Edaravone-treated rats (227.6mm^3) being significantly lower than that in the control rats (264.0mm^3). Edaravone treatment also decreased the postischemic hemorrhage volumes (53.4mm^3 in Edaravone-treated rats vs 176.4mm^3 in controls). In addition, the ratio of hemorrhage volume to infarct volume was lower in the Edaravone-treated rats (23.5%) than in the untreated rats (63.2%).

References:

- [1] Bai X, Zhang C, Chen A, et al. Protective Effect of Edaravone on Glutamate-Induced Neurotoxicity in Spiral Ganglion Neurons. *Neural Plast.* 2016;2016:4034218.
- [2] Okamura K, Tsubokawa T, Johshita H, et al. Edaravone, a free radical scavenger, attenuates cerebral infarction and hemorrhagic infarction in rats with hyperglycemia. *Neurol Res.* 2014;36(1):65-69.

Background

Edaravone, a classical free-radical scavenger, is an organic substance capable of crossing the blood-brain barrier and offering protection to brain cells^[1]. Edaravone's keto-enol tautomerism

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underpins its potent radical-scavenging activity, enabling Edaravone to neutralize both peroxy radicals and peroxynitrite and thereby confer cell- and neuro-protective antioxidant effects^[2]. Edaravone can also be used to treat digestive diseases, including acute liver injury, liver fibrosis^[3].

In vitro, pretreatment with 500 μ M Edaravone to spiral ganglion neurons (SGNs) for 20min reversed glutamate-induced injury: cell numbers were restored, death was prevented, spindle morphology was preserved, and debris was cleared. When 500 μ M Edaravone was instead added at 2, 6, or 12h after the glutamate insult, protection declined with delay; administration within 2h (or sooner) gave maximal rescue, whereas later time points failed to reduce cell death effectively^[4]. Treating Hepa 1-6 hepatoma cells with Edaravone (1-100 μ M) for 24h under cystine deprivation dose-dependently suppressed cell death and markedly reduced lactate dehydrogenase (LDH) leakage^[5].

In vivo, in Sprague-Dawley rats subjected to middle cerebral artery occlusion (MCAO), intraperitoneal administration of Edaravone (3mg/kg) significantly reduced both infarct volume and post-ischemic hemorrhage, yielding a markedly lower hemorrhage-to-infarct ratio than in untreated controls (23.5% vs. 63.2%)^[6]. In seven-day-old Wistar rats, daily intraperitoneal Edaravone (20mg/kg) for 14 days starting at hydrocephalus induction attenuated astrocyte activation and conferred partial protection against apoptotic cell death^[7].

References:

- [1] Huang M, Mo Y, Lei H, et al. Edaravone: A Possible Treatment for Acute Lung Injury. *Int J Gen Med.* 2024;17:3975-3986.
- [2] Duranti E, Cordani N, Villa C. Edaravone: A Novel Possible Drug for Cancer Treatment?. *Int J Mol Sci.* 2024;25(3):1633.
- [3] Lei H, Wang M, Huang M, et al. Edaravone in Digestive Diseases - A Narrative Review. *Drug Des Devel Ther.* 2025;19:5071-5084.
- [4] Bai X, Zhang C, Chen A, et al. Protective Effect of Edaravone on Glutamate-Induced Neurotoxicity in Spiral Ganglion Neurons. *Neural Plast.* 2016;2016:4034218.
- [5] Homma T, Kobayashi S, Sato H, et al. Edaravone, a free radical scavenger, protects against ferroptotic cell death in vitro. *Exp Cell Res.* 2019;384(1):111592.
- [6] Okamura K, Tsubokawa T, Johshita H, et al. Edaravone, a free radical scavenger, attenuates cerebral infarction and hemorrhagic infarction in rats with hyperglycemia. *Neurol Res.* 2014;36(1):65-69.

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[7] Garcia CAB, Catalão CHR, Machado HR, et al. Edaravone reduces astrogliosis and apoptosis in young rats with kaolin-induced hydrocephalus. *Childs Nerv Syst.* 2017;33(3):419-428.

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