Colivelin TFA

Cat. No.: HY-P1061A

Molecular Formula: $C_{119}H_{206}N_{32}O_{35}.C_2HF_3O_2$

Molecular Weight: 2759.12

Sequence Shortening: SALLRSIPAPAGASRLLLLTGEIDLP

SALLRSIPAPAGASRLLLLTGEIDLP (TFA salt)

Target: STAT; Amyloid-β; Apoptosis

Pathway: JAK/STAT Signaling; Stem Cell/Wnt; Neuronal Signaling; Apoptosis

Storage: Sealed storage, away from moisture

Powder -80°C 2 years

-20°C 1 year

* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)

SOLVENT & SOLUBILITY

In Vitro

H_2O : 50 mg/mL (18.12 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	0.3624 mL	1.8122 mL	3.6243 mL
	5 mM	0.0725 mL	0.3624 mL	0.7249 mL
	10 mM	0.0362 mL	0.1812 mL	0.3624 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: Water with 5% sefsol and 20% isopropanol
   Solubility: 6.25 mg/mL (2.27 mM); Suspended solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Colivelin TFA is a brain penetrant neuroprotective peptide and a potent activator of STAT3, suppresses neuronal death by activating STAT3 in vitro[1]. Colivelin TFA exhibits long-term beneficial effects against neurotoxicity, Aβ deposition, neuronal apoptosis, and synaptic plasticity deficits in neurodegenerative disease[2]. Colivelin TFA has the potential for the treatment of alzheimer's disease and ischemic brain injury[1].

IC_{50} & Target

STAT3 Amyloid-β

In Vitro

Colivelin completely suppresses death induced by overexpressed FAD-causative genes and Aβ1-43 at a concentration of 100 fm, and keep its neuroprotective action at or above the levels of 1 nm[1].

Colivelin-induced neuroprotection occurs via two neuroprotective pathways: one mediated by Ca^{2+}/calmodulin-dependent protein kinase IV, triggered by ADNF, and one mediated by signal transducer and activator of transcription 3, triggered by HN[1].

Colivelin reverses caspase3, Bax and Bcl-2 expressions in HT22 cells medaited by rmMFG-E8 in the co-cultured cells under OGD condition[4].
Colivelin (50 μg/mL, 4 hours) significantly increases the p-STAT3 protein levels in BV-2 cells[4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis[4]

Cell Line:	BV-2 cells.
Concentration:	50 μg/mL.
Incubation Time:	4 hours.
Result:	Increased p-STAT3 levels.

Cell Viability Assay[5]

Cell Line:	KYSE70 and TE8 cells.
Concentration:	0.5 μM.
Incubation Time:	1 hour (followed by CYT-Rx20 treatment)
Result:	Significantly suppressed the viability in KYSE70 and TE8 cells.

In Vivo

Colivelin(intracerebroventricular administration; 10 pmol/3 μl; 3 weeks) suppresses impairment in spatial working memory induced by repetitive intracerebroventricular injection of Aβ25-35 or Aβ1-42, in addition, it antagonizes neuronal loss in the CA1 region of hippocampus induced by hippocampal injection of Aβ1-42[1].
Colivelin (intraperitoneal administration; 1.4, 7, or 35 nM/0.21mL; on the Y-maze testday) suppresses memory impairment caused by 3-quinuclidinyl benzilateand restricts functional memory deficit[1].
Colivelin (intraperitoneal injection; 1 mg/kg; 14 days) results in improved motor and cognitive function with time by performance of mNSS, rotarod, and corner turning test.It also reduces lesion volume and improves neurological deficits after MCAO[1].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	CD-1 mice[1]
Dosage:	10 pmol/3 μl
Administration:	Intracerebroventricular administration
Result:	Completely suppressed Aβ 25-35-mediated impairment in spatial working memory and increased the number of immunoreactive neurons.

Animal Model:	C57 mice[1]
Dosage:	1.4, 7, or 35 nM/0.21mL
Administration:	Intraperitoneal administration
Result:	Protected against cholinotoxin-induced amnesia in mice.

Animal Model:	Male C57BL/6 mice[3]
Dosage:	1 mg/kg

Administration:	Intraperitoneal administration
Result:	Protected against ischemic brain injury, and improves neurological outcomes.

CUSTOMER VALIDATION

- Sci Transl Med. 2021 Oct 6;13(614):eabg6428.
- Nat Commun. 2021 Nov 25;12(1):6891.
- Proc Natl Acad Sci U S A. 2022 Oct 11;119(41):e2122099119.
- Cancer Immunol Immunother. 2022 Jun 20.
- J Inflamm Res. 24 May 2022.

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REFERENCES

[1]. Chiba T, et al. Development of a femtomolar-acting humanin derivative named colivelin by attaching activity-dependent neurotrophic factor to its N terminus: characterization of colivelin-mediated neuroprotection against Alzheimer's disease-relevant insult

[2]. Zhao H, et al. Colivelin Rescues Ischemic Neuron and Axons Involving JAK/STAT3 Signaling Pathway.Neuroscience. 2019 Sep 15;416:198-206.

[3]. Pan Z, et al. Upregulation of HSP72 attenuates tendon adhesion by regulating fibroblast proliferation and collagen production via blockade of the STAT3 signaling pathway.Cell Signal. 2020 Mar 18:109606.

[4]. Fang YY, et al. MFG-E8 alleviates oxygen-glucose deprivation-induced neuronal cell apoptosis by STAT3 regulating the selective polarization of microglia. Int J Neurosci. 2020 Mar 12:1-10.

[5]. Chiu WC, et al. The Synthetic β-Nitrostyrene Derivative CYT-Rx20 Inhibits Esophageal Tumor Growth and Metastasis via PI3K/AKT and STAT3 Pathways. PLoS One. 2016 Nov 22;11(11):e0166453.

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