Chlorotoxin

Cat. No.:	HY-P0173A
CAS No.:	163515-35-3
Molecular Formula:	$C_{158}H_{249}N_{53}O_{47}S_{11}$
Molecular Weight:	3995.71
Sequence:	Met-Cys-Met-Pro-Cys-Phe-Thr-Thr-Asp-His-Gln-Met-Ala-Arg-Lys-Cys-Asp-Asp-Cys-Cys-Gly-Gly-Lys-Gly-Arg-Gly-Lys-Cys-Tyr-Gly-Pro-Gln-Cys-Leu-Cys-Arg-NH2 (Disulfide bridge: Cys2-Cys19,Cys5-Cys28,Cys16-Cys33,Cys20-Cys35)
Sequence Shortening:	MCMPCFTTDHQMARKCDDCCGGKGRGKCYGPQCLCR-NH2 (Disulfide bridge: Cys2-Cys19,Cys5-Cys28,Cys16-Cys33,Cys20-Cys35)
Target:	Chloride Channel
Pathway:	Membrane Transporter/Ion Channel
Storage:	Sealed storage, away from moisture Pure form -80°C 2 years -20°C 1 year * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)

BIOLOGICAL ACTIVITY

Description	Chlorotoxin is a 36 amino-acid peptide from the venom of the Israeli scorpion Leiurus quinquestriatus with anticancer activity. Chlorotoxin is a chloride channel blocker.
IC_{50} & Target	Target: Chloride Channel[1]
In Vitro	Chlorotoxin (Chlorotoxin) preferentially binds to tumor cells and has been harnessed to develop an imaging agent to help visualize tumors during surgical resection. In addition, chlorotoxin has potential as a vehicle to deliver anti-cancer drugs specifically to cancer cells. Chlorotoxin is shown to bind glioma cells, but is unable to bind normal rat astrocytes and Te671, a human rhabdomyosarcoma cell line. Chlorotoxin inhibits the migration of U251MG (glioma) cells, with an IC_{50} of 600 nM[2]. Chlorotoxin binds to glioma cells is specific and involves high affinity (K_d=4.2 nM) and low affinity (K_d=660 nM) binding sites [3].Small conductance chloride channels are shown to be potently blocked by Chlorotoxin. Chlorotoxin has been used as a general pharmacological tool to investigate the function of chloride channels[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Chlorotoxin shows insecticidal activity on insects and other invertebrates. After the administration of I-Chlorotoxin to tumor-bearing mice, the peptides accumulated within the tumor[2].Chlorotoxin selectively accumulates in the brain of tumor-bearing mice with calculated brain: muscle ratios of 36.4% of injected dose/g (ID/g), as compared to 12.4%ID/g in control animals[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [3]	Mouse: At 24, 48, 72, and 96 h after tumor-bearing and control SCID mice are injected with ^{125}I-labeled Chlorotoxin, they are anesthetized and imaged. Both ^{125}I- and ^{131}I-labeled Chlorotoxin-injected animals and their control counterparts are killed

at indicated time points for biodistribution studies[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Pain. 2021 Jun 1;162(6):1882-1896.

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REFERENCES

[1]. DeBin JA, et al. Purification and characterization of chlorotoxin, a chloride channel ligand from the venom of the scorpion. Am J Physiol. 1993 Feb;264(2 Pt 1):C361-9.

[2]. Ojeda PG, et al. Chlorotoxin: Structure, activity, and potential uses in cancer therapy. Biopolymers. 2016 Jan;106(1):25-36.

[3]. Soroceanu L, et al. Use of chlorotoxin for targeting of primary brain tumors. Cancer Res. 1998 Nov 1;58(21):4871-9.

[4]. Dardevet L, et al. Chlorotoxin: a helpful natural scorpion peptide to diagnose glioma and fight tumor invasion. Toxins (Basel). 2015 Mar 27;7(4):1079-101.

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