Product Data Sheet

Product Name: Chlorotoxin (trifluoroacetate salt)
Cat. No.: GC92127

Chemical Properties

Cas. No.

Chemical Name: L-methionyl-L-cysteinyl-L-methionyl-L-prolyl-L-cysteinyl-L-phenylalanyl-L-threonyl-L-threonyl-L-α-aspartyl-L-histidyl-L-glutaminyl-L-methionyl-L-alanyl-L-arginyl-L-lysyl-L-cysteinyl-L-α-aspartyl-L-α-aspartyl-L-cysteinyl-L-cysteinylglycylglycyl-L-lysylglycyl-L-arginylglycyl-L-lysyl-L-cysteinyl-L-tyrosylglycyl-L-prolyl-L-glutaminyl-L-cysteinyl-L-leucyl-L-cysteinyl-L-argininamide, cyclic (2→19),(5→28),(16→33),(20→35)-tetrakis(disulfide), trifluoroacetate salt

SMILES: OC(C[C@H](NC([C@]([H])([C@@H](C)O)NC([C@]([H])([C@@H](C)O)NC([C@@H](NC([C@H]1NC([C@@H]2CCCN2C([C@H](CCSC)NC([C@H]3NC([C@H](CCSC)N[H])=O)=O)=O)=O)=O)CC4=CC=CC=C4)=O)=O)=O)C(N[C@@H](CC5=CNC=N5)C(N[C@@H](CCC(N)=O)C(N[C@@H](CCSC)C(N[C@H](C(N[C@@H](CCCNC(N)=N)C(N[C@@H](CCCCN[H])C(N[C@@H]6C(N[C@@H](CC(O)=O)C(N[C@@H](CC(O)=O)C(N[C@@H](CSSC3)C(N[C@@H]7C(NCC(NCC(N[C@@H](CCCCN[H])C(NCC(N[C@@H](CCCNC(N)=N)C(NCC(N[C@@H](CCCCN[H])C(N[C@@H](CSSC1)C(N[C@@H](CC(C=C8)=CC=C8O)C(NCC(N9CCC[C@H]9C(N[C@@H](CCC(N)=O)C(N[C@@H](CSSC6)C(N[C@H](C(N[C@@H](CSSC7)C(N[C@@H](CCCNC(N)=N)C(N)=O)=O)=O)CC(C)C)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)=O)C)=O)=O)=O)=O)=O.OC(C(F)(F)F)=O

Formula: $C_{158}H_{249}N_{53}O_{47}S_{11}$? XCF_3COOH M.Wt: 3995.7

Solubility: Water: Sparingly soluble: 1-10 mg/ml Storage: -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.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
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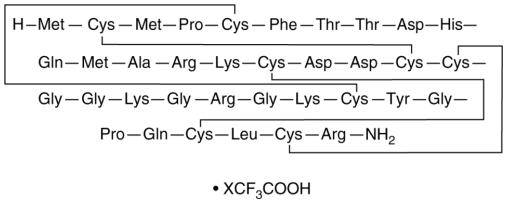
Product Data Sheet

Structure



Background

Chlorotoxin is a peptide originally isolated from the venom of the scorpion *L. quinquestriatus*.[1,2] It inhibits chloride currents in rat colonic enterocyte plasma membrane preparations when used at a concentration of 594 nM.[1] Chlorotoxin also binds to, but does not inhibit, matrix metalloproteinase-2 (MMP-2; IC_{50}s = 0.71 and >30 ?M, respectively), as well as neuropilin-1 (NRP-1; IC_{50} = 0.78 ?M) in cell-free assays.[3] It induces paralysis in crayfish (*P. clarkii*) but is not cytotoxic to human U87MG glioma, MCF-7 breast cancer, PC3 prostate cancer, and A549 lung cancer cells.[1,2] Administration of chimeric antigen receptor (CAR) T cells expressing CAR with chlorotoxin as the targeting domain increase survival and decrease tumor volume in an orthotopic patient-derived xenograft (PDX) mouse model of glioblastoma.[4] Liposomes containing chlorotoxin and encapsulating doxorubicin decrease tumor volume in a U87 glioma mouse xenograft model.[5] Fluorescently labeled chlorotoxin has been used for tumor imaging *in vivo*.[6]

References:

[1]. DeBin, J.A., Maggio, J.E., and Strichartz, G.R.Purification and characterization of chlorotoxin, a chloride channel ligand from the venom of the scorpionAm. J. Physiol.264(2 Pt 1)C361-C369(1993).
[2]. Ayed, A.S., Omran, M.A.A.A., Nabil, Z.I., et al.C-terminal amidation of chlorotoxin does not affect tumour cell proliferation and has no effect on toxin cytotoxicityInt. J. Pept. Res. Ther.27(1)659-667(2021).
[3]. Farkas, S., Cioca, D., Murányi, J., et al.Chlorotoxin binds to both matrix metalloproteinase 2 and neuropilin 1J. Biol. Chem.299(9)104998(2023).
[4]. Wang, D., Starr, R., Chang, W.C., et al.Chlorotoxin-directed CAR T cells for specific and effective targeting of glioblastomaSci. Transl. Med.12(533)eaaw2672(2020).
[5]. Xiang, Y., Liang, L., Wang, X., et al.Chloride channel-mediated brain glioma targeting of chlorotoxin-modified doxorubicine-loaded liposomesJ. Control Release152(3)402-410(2011).
[6]. Veiseh, M., Gabikian, P., Bahrami, S.B., et al.Tumor paint: A chlorotoxin:Cy.
[5]. 5 bioconjugate for intraoperative visualization of cancer fociCancer Res.67(14)6882-6888(2007).

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