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# ProductInformation

## Charybdotoxin

Product Number **C 7802**
Storage Temperature -0 °C

### Product Description

Molecular Formula: $C_{176}H_{277}N_{57}O_{55}S_7$
Molecular Weight: 4,295
CAS Number: 95751-30-7
Synonym: CbTX

The single chain peptide charybdotoxin is an inhibitor of $K^+$ channels. It has been isolated from the venom of the scorpion *Leiurus quinquestriatus* var. *hebraeus*. In particular, CbTX is a potent, reversible, and selective inhibitor of $Ca^{2+}$-activated $K^+$ channels in GH3 anterior pituitary cells and primary bovine aortic smooth muscle cells, at an apparent $K_D$ of 2.1 nM.[2] Reviews of the use of CbTX and other peptides to probe $K^+$ channel activity have been published.[3,4]

In cultured wild-type mouse proximal convoluted tubule (PCT) epithelial cells, CbTX has been utilized at 10 nM to inhibit $K^+$ currents, using a whole-cell clamp method.[5] CbTX and other $K^+$ channel antagonists have been used to probe proliferation, differentiation, and apoptosis in cultured porcine granulosa cells.[6]

Several solid-phase synthesis procedures for CbTX have been reported.[7,8] A solution phase synthesis procedure for CbTX has been described.[9] The amino acid sequence for charybdotoxin is:

pGlu-Phe-Thr-Asn-Val-Ser-Cys-Thr-Thr-Ser-Lys[11]-Glu-Cys-Trp-Ser-Val-Cys-Gln-Arg-Leu-His[21]-Asn-Thr-Ser-Arg-Gly-Lys-Cys-Met-Asn-Lys<SUP>31</SUP>-Lys-Cys-Arg-Cys-Try-Ser-OH

There are disulfide bonds present between $Cys^7$-$Cys^{28}$, $Cys^{13}$-$Cys^{33}$, and $Cys^{17}$-$Cys^{35}$. The counterion used during synthesis is trifluoroacetate.

### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

### Preparation Instructions

This product is soluble in water (1 mg/ml), yielding a clear, colorless solution. It is also soluble in most aqueous buffers.

### Storage/Stability

Solutions of this product should be prepared in a solvent which has been deaerated and purged with an inert gas. Solutions of this product should be stored in single use aliquots at -20 °C. Repeated freeze/thaw cycles should be avoided.

### References

1. The Merck Index, 12th ed., Entry# 2087.
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3. Garcia, M. L., et al., Charybdotoxin and its effects on potassium channels. Am. J. Physiol., **269(1 Pt 1)**, C1-10 (1995).
4. Moczydlowski, E., et al., An emerging pharmacology of peptide toxins targeted against potassium channels. J. Membr. Biol., **105(2)**, 95-111 (1988).
5. Barriere, H., et al., Swelling-activated chloride and potassium conductance in primary cultures of mouse proximal tubules. Implication of KCNE1 protein. J. Membr. Biol., **193(3)**, 153-170 (2003).
6. Manikkam, M., et al., Potassium channel antagonists influence porcine granulosa cell proliferation, differentiation, and apoptosis. Biol. Reprod., **67(1)**, 88-98 (2002).
7. Sugg, E. E., et al., Synthesis and structural characterization of charybdotoxin, a potent peptidyl inhibitor of the high conductance $Ca^{2+}$-activated $K^+$ channel. J. Biol. Chem., **265(31)**, 18745-18748 (1990).

8. Vita, C., et al., Synthesis of charybdotoxin and of two N-terminal truncated analogues. Structural and functional characterisation. Eur. J. Biochem., **217(1)**, 157-169 (1993).

9. Lambert, P., et al., Solution synthesis of charybdotoxin (ChTX), a $K^+$ channel blocker. Biochem. Biophys. Res. Commun., **170(2)**, 684-690 (1990).

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