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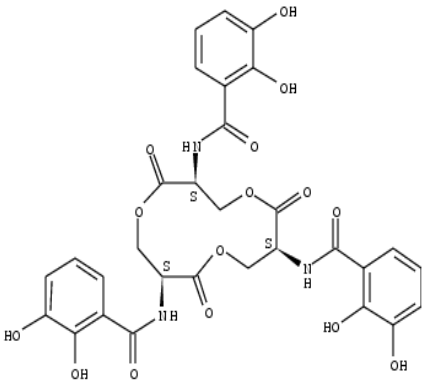
Product Information

Enterobactin
from *Escherichia coli*

Catalog Number **E3910**
Storage Temperature –20 °C

CAS RN 28384-96-5
Synonym: Enterochelin



Product Description

Molecular formula: $C_{30}H_{27}N_3O_{15}$
Molecular weight: 669.55

Iron mobilization and uptake by microbes is mediated by low molecular weight complexing agents named siderophores.[1] Enterobactin is a catechol [a benzene-diol, $C_6H_4(OH)_2$] type siderophore produced in small quantities by *Escherichia coli* and related enteric bacteria when grown on iron deficient media,[2] and is the most powerful ferric ion complexing agent known.[1,3]

Since it is highly hydrophobic, in order to act as a siderophore, enterobactin undergoes modifications by the *iroA* gene cluster inside the mammalian host before it is secreted.[4] In *Escherichia coli*, enterobactin synthesis inhibition occurs through the binding of Fe^{2+} to Fur and Diphtheria toxin repressor proteins (DtxR).[2]

Enterobactin is a very effective sequestering agent for iron, forming an unusual macro-bridged hexacoordinate trianon. Therefore, it can easily remove iron from proteins, insoluble iron complexes, and other siderophores.[3,6] Studies of the chemistry, regulation, synthesis, recognition, and transport of enterobactin make it the best-understood siderophore.[5]

Complexes of enterobactin with scandium (Sc^{3+}) and indium (In^{3+}) were shown to have antibacterial effect against *Klebsiella pneumoniae*, similar to that obtained with kanamycin sulfate. The Sc^{3+}-enterobactin complex was found to be active at 0.2 μM and appears to form an equilibrium mixture with Fe^{3+}-enterobactin complex.[7] The In^{3+}-enterobactin complex does not produce complete bacteriostasis but rather a marked increase in generation time.

Purity: ≥98% (HPLC)

Preparation instructions

Soluble at 10 mg/ml in DMSO or acetonitrile:water (9:1).

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store the product sealed at –20 °C. Under these conditions the product is stable for at least 2 years.

References

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2. Braun, V., and Braun, M., Iron transport and signaling in *Escherichia coli*. *FEBS Lett.*, **529**, 78-85 (2002).
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4. Fischbach, M.A., et al., How pathogenic bacteria evade mammalian sabotage in the battle for iron. *Nat. Chem. Biol.,* **2**, 132-138 (2006).
5. Raymond, K.N., et al., Enterobactin: An archetype for microbial iron transport. *Proc. Natl. Acad. Sci. USA*, **100**, 3584-3588 (2003).

6. Hollifield, W.C. Jr., and Neilands, J.B., Ferric enterobactin transport system in *Escherichia coli* K-12. Extraction, assay, and specificity of the outer membrane receptor. *Biochemistry*, **17**, 1922-1928 (1978).

7. Rogers, H.J., et al., Antibacterial effect of scandium and indium complexes of entrochelin on *Klebsiella pneumoniae*. *Antimicrob. Agents Chemother.*, **18**, 63-68 (1980).

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