ProductInformation

IRON(III)meso-TETRA-(N-METHYL-4-PYRIDINIUM)PORPHYRIN (Fe(III)T(4-N-MePy)P)

Product No. **I1648**
Lot 75H8872

Store at 2-8°C
CAS # [61943-73-5]

PRODUCT SUMMARY

Extinction coefficient (422nm, H_2O): 105 $mM^{-1}cm^{-1}$
Solubility: Fe(III)T(4-N-MePy)P is soluble at 10 mg/ml in H_2O.

Structure: See Figure 1.

Functional Assay

In the presence of O_2 and a reducing agent or terminal oxidants, Fe(III)T(4-N-MePy)P cleaves DNA at $(AT)_3$[1].

References

1. Ward,B., Skorobogarty,A. and Dabrowiak,J.C. (1986) *Biochemistry*, **25**, 6875-6883
2. Ward,B., Skorobogarty,A. and Dabrowiak,J.C. (1986) *Biochemistry*, **25**, 7827-7833
3. Hui,X., Gresh,N. and Pullman,B. (1990) *Nucl. Acids Res.*, **18**, 1109-1114
4. Pasternack,R.F,, Gibbs,E.J. and Villafranka,J.J. (1983) *Biochemistry*, **22**, 5409-5417
5. Pasternack,R.F,, Gibbs,E.J. and Villafranka,J.J. (1983) *Biochemistry*, **22**, 2406-2414
6. Pasternack,R.F., Lee,H., Malek,P., Spencer,C., (1977) *J. Inorg. Nucl. Chem.* **39**, 1865-1870
7. Byrnes,R.W., Fiel,R.J. and Datta-Gupta,N. (1988) *Chem.-Biol. Interact.* **67**, 225-242
8. Bernadou,J., Pratviel,G., Bennis,F. Girardet,M. and Meunier,B. (1989) *Biochemistry*, **28**, 7268-7275
9. Ding,L., Bernadou,J. and Meunier,B. (1991) *Bioconj. Chem.*, **2**, 201-206

BACKGROUND INFORMATION

Tetra-4-N-methylpyridinium porphyrins bind to DNA via groove binding and intercalative mechanisms[1-5] . Intercalation is prohibited by axial ligation of the central metal ion by solvent molecules and/or counterions[2,4,5]. These porphyrins are therefore restricted to binding to DNA via an electrostatic binding mechanism[1-5]. Iron(III)T(4-N-MePy)P is an axially ligated [6] metallo tetracationic porphyrin which binds[2] and oxidatively cleaves[1] DNA from the minor groove of its binding site, minimally $(AT)_3$. Strand scission can be initiated by the addition of reducing agents and molecular oxygen or terminal oxidants to the porphyrin-DNA complex. The redox reagents include: ascorbate/O_2[1], DTT/O_2[7], superoxide[1], iodosobenzene[1] and potassium peroxymonosulfate (oxone)[8,9].

FUNCTIONAL ASSAY

1 µg of pBR322 DNA in 45 µl of 10 mM Tris-HCl, pH 7.6, 1 mM EDTA containing from 1.0 mM to 0.1 nM Fe(III)T(4-N-MePy)P in 10 fold increments of dilution were incubated at 37°C for 30 minutes. To initiate strand scission, 5 µl of 20 mM oxone (Sigma Product No. P 1429) was added. The cleavage reaction was allowed to proceed for 30 minutes. Gel loading solution (Sigma Product No. G-2526, 40% (w/v) sucrose, 0.1 M EDTA, 0.5% (w/v) SDS and 0.05% (w/v) bromphenol blue) was then added to the reactions which were then immediately analyzed by agarose gel electrophoresis.

Lot specific results: At ≥100 nM (Fe(III)T(4-N-MePy)P), the supercoiled band was completely degraded; at 10 nM (Fe(III)T(4-N-MePy)P), the supercoiled band was converted to >90% open circular DNA; at ≤1 nM (Fe(III)T(4-N-MePy)P), the supercoiled band was comparable to the control which did not contain (Fe(III)T(4-N-MePy)P). In the absence of oxone no DNA degradation was observed.

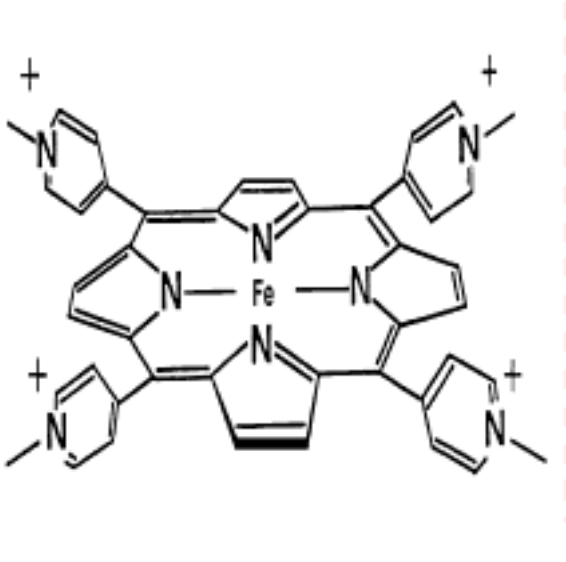

Figure 1. Structure of (Fe(III)T(4-N-MePy)P)

Pcs2/00