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, H2O): 105 mM⁻¹ cm⁻¹
Solubility: Fe(III)T(4-N-MePy)P is soluble at 10 mg/ml in H2O.

Structure: See Figure 1.

Functional Assay
In the presence of O₂ and a reducing agent or terminal oxidants, Fe(III)T(4-N-MePy)P cleaves DNA at (AT)₃.

References

BACKGROUND INFORMATION
Tetra-4-N-methylpyridinium porphyrins bind to DNA via groove binding and intercalative mechanisms1-5 . Intercalation is prohibited by axial ligation of the central metal ion by solvent molecules and/or counterions2,4,6 . These porphyrins are therefore restricted to binding to DNA via an electrostatic binding mechanism1-6 . Iron(III)T(4-N-MePy)P is an axially ligated6 metallo tetracationic porphyrin which binds5 and oxidatively cleaves1 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/O₂ 1 , DTT/O₂ 7 , superoxide5, iodosobenzene1 and potassium peroxymonosulfate (oxone)5,8,9.

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)