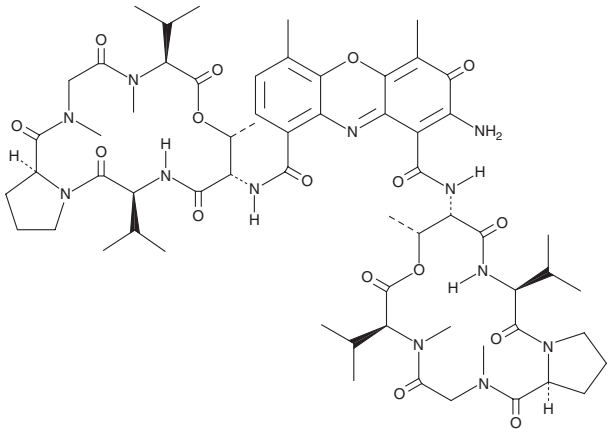
PRODUCT INFORMATION

Actinomycin D

Item No. 11421

CAS Registry No.:	50-76-0
Formal Name:	2-amino-N,N'-bis(hexadecahydro-6,13-diisopropyl-2,5,9-trimethyl-1,4,7,11,14-pentaoxo-1H-pyrrolo[2,1-i][1,4,7,10,13]oxatetraazacyclohexadecin-10-yl)-4,6-dimethyl-3-oxo-3H-phenoxazine-1,9-dicarboxamide
Synonyms:	Cosmegen, Dactinomycin, Meractinomycin, NCI C04682, NSC 3053, Oncostatin K
MF:	$C_{62}H_{86}N_{12}O_{16}$
FW:	1,255.5
Purity:	≥95%
UV/Vis.:	λ_{max}: 204, 240, 444 nm
Supplied as:	A crystalline solid
Storage:	-20°C
Stability:	≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Actinomycin D is supplied as a crystalline solid. A stock solution may be made by dissolving the actinomycin D in the solvent of choice, which should be purged with an inert gas. Actinomycin D is soluble in organic solvents such as DMSO and dimethyl formamide (DMF). The solubility of actinomycin D in these solvents is approximately 10 and 20 mg/ml, respectively.

Actinomycin D is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, actinomycin D should first be dissolved in DMF and then diluted with the aqueous buffer of choice. Actinomycin D has a solubility of approximately 0.5 mg/ml in a 1:1 solution of DMF:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

Description

Actinomycin D is a cyclic polypeptide-containing antibiotic that binds to DNA and blocks transcription. It binds to pre-melted double-stranded DNA in transcription bubbles and once bound is slow to dissociate.[1,2] DNA in transcriptionally hyperactive cancer cells efficiently and rapidly bind actinomycin D at low concentrations (~10 nM), which interferes with RNA synthesis and ultimately leads to cell death.[1,3] Actinomycin D is widely used as an anticancer agent for treating a variety of tumors and along with its fluorescent derivative, 7-aminoactinomycin D (Item No. 11397) has become a useful tool in biochemistry and molecular biology research as a marker for DNA.

References

1. Paramanathan, T., Vladescu, I., McCauley, M.J., *et al*. Force spectroscopy reveals the DNA structural dynamics that govern the slow binding of Actinomycin D. *Nucleic Acids Res.* **40(11)**, 4925-4932 (2012).
2. Sobell, H.M. Actinomycin and DNA transcription. *Proc. Natl. Acad. Sci. USA* **82**, 5328-5331 (1985).
3. Choong, M.L., Yang, H., Lee, M.A., *et al*. Specific activation of the p53 pathway by low dose actinomycin D: A new route to p53 based cyclotherapy. *Cell Cycle* **8(17)**, 2810-2818 (2009).

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