

Store at  
-20°C

# Actinomycin D

#15021

5 mg



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New 01/16

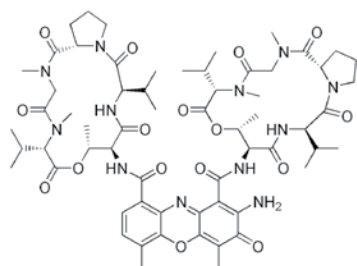
**For Research Use Only. Not For Use In Diagnostic Procedures.**

**Background:** Actinomycin D is an effective anti-tumor agent and the most widely studied member of the actinomycin group of antibiotics (1). The compound, isolated from soil bacteria of the *Streptomyces* genus, is comprised of two cyclic pentapeptides bound by a phenoxazone group (2,3). Actinomycin D inhibits mRNA transcription in mammalian cells. Actinomycin D intercalates DNA and stabilizes topoisomerase I-DNA covalent complexes, blocking RNA chain elongation by RNA polymerase and consequently inhibiting protein synthesis (1,4,5). This mechanism of action induces p53-mediated cell cycle arrest in numerous cancer cell lines (6,7) and at high concentrations can induce apoptosis (8). Additional research studies show that Akt mediates actinomycin D-induced p53 expression (9).

#### Background References:

- (1) Koba, M. and Konopa, J. (2005) *Postepy Hig Med Dosw (Online)* 59, 290-8.
- (2) Bensaude, O. (2011) *Transcription* 2, 103-108.
- (3) Lo, Y.S. et al. (2013) *Nucleic Acids Res* 41, 4284-94.
- (4) Sobell, H.M. (1985) *Proc Natl Acad Sci U S A* 82, 5328-31.
- (5) Trask, D.K. and Muller, M.T. (1988) *Proc Natl Acad Sci U S A* 85, 1417-21.
- (6) Chang, D. et al. (1999) *Cell Growth Differ* 10, 155-62.
- (7) Khan, Q.A. and Dipple, A. (2000) *Carcinogenesis* 21, 1611-8.
- (8) Fraschini, A. et al. (2005) *Histol Histopathol* 20, 107-17.
- (9) Chen, C.S. et al. (2014) *Oncotarget* 5, 693-703.

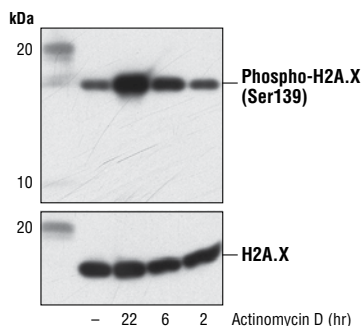
**Molecular Formula:** C<sub>62</sub>H<sub>86</sub>N<sub>12</sub>O<sub>16</sub>



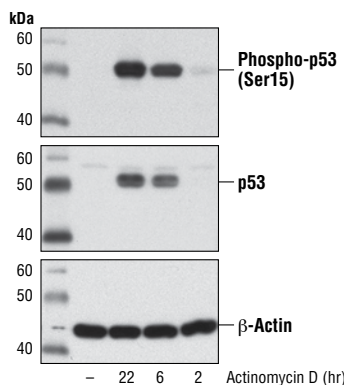
**Molecular Weight:** 1255.4 g/mol

**Solubility:** Soluble in DMSO at 50 mg/ml.

**Purity:** >98%



Western blot analysis of extracts from MCF7 cells, untreated (-) or treated with Actinomycin D (1  $\mu$ M) at the indicated times, using Phospho-Histone H2A.X (Ser139) (20E3) Rabbit mAb #9718 (upper) and Histone H2A.X (D17A3) XP<sup>®</sup> Rabbit mAb #7631 (lower).



Western blot analysis of extracts from MCF7 cells, untreated (-) or treated with Actinomycin D (1  $\mu$ M) at the indicated times, using Phospho-p53 (Ser15) Antibody #9284 (upper), p53 (7F5) Rabbit mAb #2527 (middle), and  $\beta$ -Actin (D6A8) Rabbit mAb #8457 (lower).

**Storage:** Store lyophilized or in solution at -20°C, desiccated. Protect from light. In lyophilized form, the chemical is stable for 24 months. Once in solution, use within 1 week to prevent loss of potency. Aliquot to avoid multiple freeze/thaw cycles.

**Directions for Use:** Actinomycin D is supplied as a lyophilized powder. For a 10 mM stock, reconstitute the 5 mg in 398.28  $\mu$ l DMSO. Working concentrations and length of treatment can vary depending on the desired effect, but it is typically used at 10-1,000 nM for 6-48 hr.

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