**Actinomycin D**

**Applications:**
- Western
- IP — Immunoprecipitation
- IHC — Immunohistochemistry
- ChIP — Chromatin Immunoprecipitation
- IF — Immunofluorescence
- F — Flow cytometry
- E-P — ELISA-Peptide

**Species Cross-Reactivity:**
- H — human
- M — mouse
- R — rat
- Hm — hamster
- Mk — monkey
- Mi — mink
- C — chicken
- Dm — D. melanogaster
- X — Xenopus
- Z — zebrafish
- B — bovine
- Dg — dog
- Pg — pig
- Se — S. cerevisiae
- Ce — C. elegans
- Hr — horse
- All — all species expected

Species enclosed in parentheses are predicted to react based on 100% homology.

**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 penta-peptides 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:**

**Molecular Formula:** C$_{62}$H$_{86}$N$_{12}$O$_{16}$

**Molecular Weight:** 1255.4 g/mol

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

**Purity:** >98%

**Store at -20°C**

**Order #:** 15021

**5 mg**

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

**Support:**
- U.S.: +1-978-867-2388
- www.cellsignal.com/support

**Orders:**
- U.S.: 877-616-2355
- orders@cellsignal.com

**www.cellsignal.com**

---

**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 penta-peptides 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).

**Molecular Formula:** C$_{62}$H$_{86}$N$_{12}$O$_{16}$

**Molecular Weight:** 1255.4 g/mol

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

**Purity:** >98%

**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 μl 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.

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

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

---

Thank you for your recent purchase. If you would like to provide a review visit www.cellsignal.com/comments.