Small Molecules

Puromycin (Dihydrochloride)

Antibiotic; Protein synthesis inhibitor

Catalog #73342 50 mg
73344 500 mg

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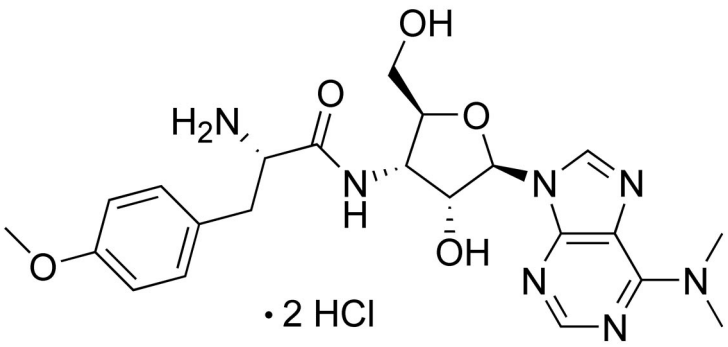
Product Description

Puromycin is an aminonucleoside antibiotic derived from Streptomyces alboniger that acts as a protein synthesis inhibitor. It binds to the target ribosome site A, where it is transferred to the growing polypeptide chain causing premature chain termination (Azzam & Algranati; Lührmann et al.; Rodriguez-Fonseca et al.). A biologically inactive form is generated when Puromycin is N-acetylated by puromycin-N-acetyltransferase, allowing this gene to be used as a selective resistance marker (Vara et al.).

Molecular Name: Puromycin (Dihydrochloride)
Alternative Names: CL 13900; CL 16536; NSC 3055; PDH
CAS Number: 58-58-2
Chemical Formula: $C_{22}H_{29}N_7O_5 \cdot 2HCl$
Molecular Weight: 544.4 g/mol
Purity: ≥ 98%
Chemical Name: (2S)-2-amino-N-[(2S,4R,5R)-5-[6-(dimethylamino)purin-9-yl]-4-hydroxy-2-(hydroxymethyl)oxolan-3-yl]-3-(4-methoxyphenyl)propanamide, dihydrochloride

Structure:



Properties

Physical Appearance: A crystalline solid

Storage: Product stable at -20°C as supplied. Protect from prolonged exposure to light. Stable as supplied for 12 months from date of receipt.

Solubility:
- PBS (pH 7.2) ≤ 15 mM
- DMSO ≤ 20 mM
- Absolute ethanol ≤ 1.5 mM

For example, to prepare a 10 mM stock solution in PBS, resuspend 50 mg in 9.18 mL of PBS (pH 7.2).

Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

CELL LINE DEVELOPMENT

· Selects for cells expressing puromycin-N-acetyltransferase resistance gene as a research tool (de la Luna & Ortín; Iwaki et al.).
· Useful in CRISPR/Cas9 mammalian gene editing by selecting for successful Cas9-induced knock-in with puromycin resistance gene (Park et al.).

CANCER RESEARCH

· Possesses anti-tumor activity when tested against numerous cell lines (Foley & Eagle).

References

Azzam ME & Algranati ID. (1973) Mechanism of puromycin action: fate of ribosomes after release of nascent protein chains from polysomes. Proc Natl Acad Sci USA 70(12): 3866–9.

Foley GE & Eagle H. (1958) The cytotoxicity of anti-tumor agents for normal human and animal cells in first tissue culture passage. Cancer Res 18(9): 1011–6.

Iwaki T et al. (2003) Rapid selection of Drosophila S2 cells with the puromycin resistance gene. Biotechniques 35(3): 482–4, 486.

de la Luna S & Ortín J. (1992) pac gene as efficient dominant marker and reporter gene in mammalian cells. Methods Enzymol 216: 376–85.

Lührmann R et al. (1981) Localization of the puromycin binding site on the large ribosomal subunit of Escherichia coli by immunoelectron microscopy. Proc Natl Acad Sci USA 78(12): 7276–80.

Park A et al. (2014) CRISPR/Cas9 allows efficient and complete knock-in of a destabilization domain-tagged essential protein in a human cell line, allowing rapid knockdown of protein function. PLoS One 9(4): e95101.

Rodriguez-Fonseca C et al. (2000) Puromycin-rRNA interaction sites at the peptidyl transferase center. RNA 6(5): 744–54.

Vara et al. (1985) Biosynthesis of puromycin by Streptomyces alboniger: Characterization of puromycin N-acetyltransferase. Biochemistry 24(27): 8074–81.

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