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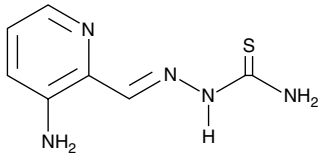
Product Information

3-AP

Item No. 15419

CAS Registry No.: 143621-35-6
Formal Name: 2-[(3-amino-2-pyridinyl)methylene]-hydrazinecarbothioamide
Synonyms: 3-Aminopyridine-2-Carboxyaldehyde Thiosemicarbazone, NSC 663249, Triapine™
MF: $C_7H_9N_5S$
FW: 195.2
Purity: ≥95%
Stability: ≥2 years at -20°C
Supplied as: A crystalline solid
UV/Vis.: λ_{max}: 207, 224, 239, 296, 368 nm



Laboratory Procedures

For long term storage, we suggest that 3-AP be stored as supplied at -20°C. It should be stable for at least two years.

3-AP is supplied as a crystalline solid. A stock solution may be made by dissolving the 3-AP in the solvent of choice. 3-AP is soluble in organic solvents such as DMSO and dimethyl formamide (DMF), which should be purged with an inert gas. The solubility of 3-AP in these solvents is approximately 20 and 25 mg/ml, respectively.

3-AP is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, 3-AP should first be dissolved in DMF and then diluted with the aqueous buffer of choice. 3-AP 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.

Ribonucleotide reductase, the rate-limiting enzyme for *de novo* DNA synthesis, is an excellent target for chemotherapy. Its increased activity in cancer cells is associated with malignant transformation and proliferation.[1] 3-AP is a ribonucleotide reductase inhibitor and iron chelator with antitumor activity.[2] At 5 µM it can enhance DU145, U251, and PSN1 tumor cell radiosensitivity *in vitro*, inhibiting DNA synthesis and repair.[2] It destroys the tyrosine free radical in the R2/p53R2 subunits of ribonucleotide reductase by forming a redox active complex with iron, thus producing reactive oxygen species.[3] Furthermore, 3-AP has been shown to activate an endoplasmic reticulum stress pathway, leading to the unfolded protein response and apoptosis.[4]

References

1. Szekeres, T., Fritizer, M., Strobl, H., *et al.* Synergistic growth inhibitory and differentiating effects of trimidox and tiazofurin in human promyelocytic leukemia HL-60 cells. *Blood* **84(12)**, 4316-4321 (1994).
2. Barker, C.A., Burgan, W.E., Carter, D.J., *et al. In vitro* and *in vivo* radiosensitization induced by the ribonucleotide reductase inhibitor triapine (3-aminopyridine-2-carboxaldehyde-thiosemicarbazone). *Clin. Cancer Res.* **12(9)**, 2912-2918 (2006).
3. Chapman, T.R. and Kinsella, T.J. Ribonucleotide reductase inhibitors: A new look at an old target for radiosensitization. *Front. Oncol.* **1**, 56 (2012).
4. Trondl, R., Flocke, L.S., Kowol, C.R., *et al.* Triapine and a more potent dimethyl derivative induce ER stress in cancer cells. *Mol. Pharmacol.* **[In press]**, (2013).

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