

Product Data Sheet

Product Name: Amsacrine

Cat. No.: GC12326

Chemical Properties

Cas. No. 51264-14-3

Chemical Name N-[4-(acridin-9-ylamino)-3-methoxyphenyl]methanesulfonamide

SMILES COC1=C(C=CC(=C1)NS(=O)(=O)C)NC2=C3C=CC=CC3=NC4=CC=CC=C42

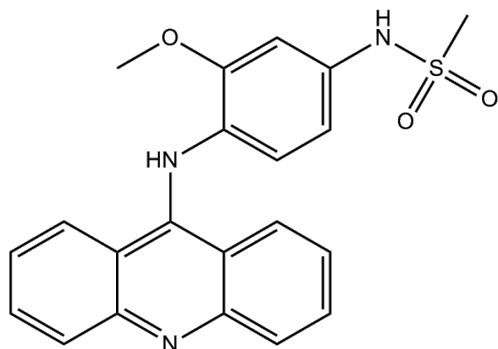
Formula C₂₁H₁₉N₃O₃S M.Wt 393.46

Solubility DMSO:9.3 mg/mL (23.64 mM; Need ultrasonic and warming) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Caution: Product has not been fully validated for medical applications. For research use only.

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Animal experiment:

Amsacrine (m-AMSA) is investigated in three separated experiments. In the first experiment, animals are treated by intraperitoneal injection with 0.5, 1.5 and 4.5 mg/kg of amsacrine and bone marrow is sampled 24 h after treatment. Preliminary negative MN results at this sampling time lead to the use of 30 h sampling time for amsacrine. Thus, in the second experiment, mice are treated with 0.5, 1.5 and 4.5 mg/kg of Amsacrine (m-AMSA) and bone marrow is sampled 30 h after treatment. The doses and sampling times for amsacrine are chosen by reference to earlier studies and the selected doses are within the dose range used for human chemotherapy. The results again show that the micronuclei frequency in the bone marrow of mice is not affected by treatment with any of the selected doses of the test agent, at 30 h sampling time, thus, in the third experiment, mice are treated with 6, 9 and 12 mg/kg of amsacrine and bone marrow is sampled 24 and 30 h after treatment.

References:

- [1]. Thomas D, et al. Inhibition of cardiac HERG currents by the DNA topoisomerase II inhibitor amsacrine: mode of action. Br J Pharmacol. 2004 Jun;142(3):485-94.
- [2]. Attia SM. Molecular cytogenetic evaluation of the mechanism of genotoxic potential of amsacrine and nocodazole in mouse bone marrow cells. J Appl Toxicol. 2013 Jun;33(6):426-33.
- [3]. Kao-Shan CS, et al. Cytogenetic effects of amsacrine on human lymphocytes in vivo and in vitro. Cancer Treat Rep. 1984 Jul-Aug;68(7-8):989-97.
- [4]. Lee YC, et al. Amsacrine-induced apoptosis of human leukemia U937 cells is mediated by the inhibition of AKT- and ERK-induced stabilization of MCL1. Apoptosis. 2016 Oct 19

Background

Amsacrine (m-AMSA; acridinyl anisidide) is an inhibitor of topoisomerase II, and acts as an antineoplastic agent which can intercalates into the DNA of tumor cells.

Amsacrine (m-AMSA) blocks HERG currents in HEK 293 cells and *Xenopus* oocytes in a concentration-dependent manner, with IC₅₀ values of 209.4 nM and 2.0 μ M, respectively. Amsacrine (m-AMSA) causes a negative shift in the voltage dependence of both activation (–7.6 mV) and

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inactivation (−7.6 mV). HERG current block by amsacrine is not frequency dependent[1]. In vitro studies of normal human lymphocytes with various concentrations of Amsacrine (m-AMSA), show both increased levels of chromosomal aberrations, ranging from 8% to 100%, and increase SCEs, ranging from 1.5 times the normal at the lowest concentration studied (0.005 µg/mL) to 12 times the normal (0.25 µg/mL)[3]. Amsacrine (m-AMSA)-induced apoptosis of U937 cells is characterized by caspase-9 and caspase-3 activation, increased intracellular Ca²⁺ concentration, mitochondrial depolarization, and MCL1 down-regulation. Amsacrine (m-AMSA) induces MCL1 down-regulation by decreasing its stability. Further, amsacrine-treated U937 cells show AKT degradation and Ca²⁺-mediated ERK inactivation[4].

In animals treated with different doses of amsacrine (0.5-12 mg/kg), the frequencies of micronucleated polychromatic erythrocytes increase significantly after treatment with 9 and 12 mg/kg. Furthermore, the present study demonstrates for the first time that Amsacrine (m-AMSA) has high incidences of clastogenicity and low incidences of aneugenicity whereas nocodazole has high incidences of aneugenicity and low incidences of clastogenicity during mitotic phases in vivo[2].

References:

- [1]. Thomas D, et al. Inhibition of cardiac HERG currents by the DNA topoisomerase II inhibitor amsacrine: mode of action. Br J Pharmacol. 2004 Jun;142(3):485-94.
- [2]. Attia SM. Molecular cytogenetic evaluation of the mechanism of genotoxic potential of amsacrine and nocodazole in mouse bone marrow cells. J Appl Toxicol. 2013 Jun;33(6):426-33.
- [3]. Kao-Shan CS, et al. Cytogenetic effects of amsacrine on human lymphocytes in vivo and in vitro. Cancer Treat Rep. 1984 Jul-Aug;68(7-8):989-97.
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