DMBA

Cat. No.: HY-W011845

CAS No.: 57-97-6

Molecular Formula: $C_{20}H_{16}$

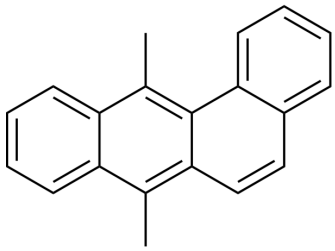
Molecular Weight: 256.34

Target: Others

Pathway: Others

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 25 mg/mL (97.53 mM; Need ultrasonic)
Acetone : 25 mg/mL (97.53 mM; Need ultrasonic)
Ethanol : 3.33 mg/mL (12.99 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	3.9011 mL	19.5053 mL	39.0107 mL
	5 mM	0.7802 mL	3.9011 mL	7.8021 mL
	10 mM	0.3901 mL	1.9505 mL	3.9011 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.5 mg/mL (9.75 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2 mg/mL (7.80 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

DMBA has carcinogenic activity as a polycyclic aromatic hydrocarbon (PAH). DMBA is used to induce tumor formation in various rodent models[1].

In Vivo

DMBA can be used in animal modeling to construct chemically induced skin carcinogenesis, breast cancer and other cancer models.

DMBA (0-150 mg/kg, p.o.) results in a decrease in spleen weight and in the total lymphocytes recovered from the spleen in C57BL/6 mice. DMBA exhibits a terminal deposition half-life of 45 min at all dose ranges (5-50 mg) in SD rats

[5]. DMBA (0-150 mg/kg, p.o.) results in a decrease in spleen weight and in the total lymphocytes recovered from the spleen in C57BL/6 mice. DMBA exhibits a terminal deposition half-life of 45 min at all dose ranges (5-50 mg) in SD rats [5].

1. Induction of breast cancer[2]

- Background

  DMBA activates AhR, which translocates into nucleus and dimerizes with cofactor ARNT, thus induces the expressions of protooncogenes c-myc.

- Specific Mmodeling Methods

  Rat: Sprague-Dawley?•?female?•?50 days •140-150 g
  Administration: 15-20 mg DMBA ?•?intragastric gavage?•?single dose

  Note

  1.5-2 g DMBA dissolved in 100 ml sesame oil

- Modeling Indicators

  Palpation:Detection of mammary cancer in 150 days.
  Histology analysis:The tumor exhibits tightly spaced chords epithelial cells, cysts and papillary structures.
  Phenotype:develops a temporary cessation in body growth.

- Opposite Product(s): Phytic acid (HY-N0814);Limonene (HY-N0544)

2. Induction of skin cancer[3]

- Background

  DMBA is metabolized to reactive intermediates, such as syn- and anti-diol epoxides, and binds extensively to epidermal DNA.

- Specific Mmodeling Methods

  European hamster:?• 10 weeks • 180-200 g •
  Administration: 25 mg DMBA • applied on the shaved back skin • single dose

Note

25 mg DMBA is dissolved in 1 ml acetone

- Modeling Indicators

  Histological analysis: Epidermal hyperplasia is oberserved. Lesions occurred frequently in the back skin, such as trichoepitheliomas, neoplastic epidermal cysts and melanotic tumors

- Opposite Product(s): α-Mangostin (HY-N0328); DHEA (HY-14650); Salidroside (HY-N0109)

3. Induction of lung cancer[4]

- Background

  DMBA is metabolized by cytochrome P450 enzymes into the carcinogenic form 7,12-DMBA-3,4-dihydrodiol-1,2-epoxide, which adducts with DNA and produces mutations.

- Specific Mmodeling Methods

  BALB/c mice:?•12 weeks?• 25-35 g • 5-20 mg/kg • intratracheal instillation • single dose.

  Note

  (1). 5-20 mg DMBA is dissolved in 0.2 ml saline.
  (2). A coat of antibiotic is applied after the instillation.

- Modeling Indicators

  Molecular changes:Increased number of macrophages in the broncho-alveolar lavage (BAL) fluid and levels of malonyldialdehyde (MDA) in lung tissue.
  Histology analysis:Inflammation with alveolar epithelial hyperplasia, adenic metaplasia, adenomatoid hyperplasia and atypical hyperplasia.

- Opposite Product(s): Diclofenac (HY-15036)

REFERENCES

[1]. HUGGINS C, et al., Mammary cancer induced by a single feeding of polymucular hydrocarbons, and its suppression. Nature. 1961 Jan 21;189:204-7.

[2]. Goerttler K, et al., Skin tumor formation in the European hamster (Cricetus cricetus L.) after topical initiation with 7,12-dimethylbenz[a]anthracene (DMBA) and promotion with 12-O-tetradecanoylphorbol-13-acetate (TPA). Carcinogenesis. 1984 Apr;5(4):521-4.

[3]. Saini RK, et al., Pulmonary carcinogenesis in mice with a single intratracheal instillation of 9, 10-dimethyl benz[a]anthracene. Drug Chem Toxicol. 2008;31(4):459-71.

[4]. Gao J, et al., Microsomal expoxide hydrolase is required for 7,12-dimethylbenz[a]anthracene (DMBA)-induced immunotoxicity in mice. Toxicol Sci. 2007 Jul;98(1):137-44.

[5]. Csiszar A, Balasubramanian P, Tarantini S, Yabluchanskiy A, Zhang XA, Springo Z, Benbrook D, Sonntag WE, Ungvari Z. Chemically induced carcinogenesis in rodent models of aging: assessing organismal resilience to genotoxic stressors in geroscience research. Geroscience. 2019 Apr;41(2):209-227.

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