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ProductInformation

Aflatoxin B_1

Product Number **A 6636**
Storage Temperature 2-8 °C

Product Description

Molecular Formula: $C_{17}H_{12}O_6$
Molecular Weight: 312.3
CAS Number: 1162-65-8
Melting Point: 268 - 269 °C
Extinction Coefficient (ethanol): E^{mM} = 25.6 (223 nm), 13.4 (265 nm), 21.8 (363 nm)
Fluorescence Emission Maxima: 425 nm (ethanol)
Synonyms: AFB1, Aflatoxin B, Aflatoxin B1, 6-Methoxydifurocoumarone

A number of mold species from the genus *Aspergillus* produce fungal metabolites called aflatoxins. Aflatoxins are an interesting example of DNA-damaging agents from a natural source. The detrimental effects of aflatoxins are due to their ability to bind covalently to DNA. The DNA damage leads to mutagenesis followed by possible cellular dysfunction. These naturally occurring mycotoxins are highly toxic and exceedingly carcinogenic. Aflatoxins are among the most potent liver carcinogens known.[1-4] At least 13 different types of aflatoxins are produced in nature.

Aflatoxins are a particular concern as food contaminates. Aflatoxins are found naturally in plant or animal derived food products with mold growth, particularly when foodstuffs are stockpiled. Their toxic derivatives can also occur as indirect contaminants in animal products. Human exposure is usually the result of food consumption, particularly peanuts.

Aflatoxin B_1 is one of several aflatoxins that can be isolated from the fermentation broth of the mold *Aspergillus flavus*. This mold is common and widespread in nature. The mold is found in soil and grows in any kind of decaying vegetation such as hay or grains stored under warm moist conditions. Although detection of this mold in foodstuffs indicates the potential of aflatoxins, the presence of this ubiquitous mold is not substantiation of aflatoxin contamination.

Among the aflatoxins of natural origin, aflatoxin B_1 is the most potent hepatocarcinogen and considered to be the most toxic.[4] Aflatoxin B_1 consists of a difurofuran ring system that is fused to a substituted coumarin moiety, with a methoxy group attached at the corresponding benzene ring. Of particular interest is the presence of derivatives of aflatoxin B_1 that can be found in edible animal products obtained from cattle that have consumed sublethal doses of aflatoxin B_1. Consumed aflatoxins are converted to aflatoxin derivatives in the liver. Aflatoxin B_1 is known to be oxidized by the mixed function oxygenases of the liver cytochrome P-450 system present in the microsomal fraction of liver extracts. This oxidation results in aflatoxin B_1-8,-9-epoxide as the major product. This reactive epoxide seems to preferentially attack certain guanine residues in double-stranded DNA, giving rise to a large guanine adduct dihydro-guanyl-hydroxyaflatoxin B_1.[2]

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in chloroform (10 mg/ml). It is also soluble in DMSO and absolute ethanol.[1]

Storage/Stability

Chloroform solutions (10 mg/ml) are stable for 2 - 3 weeks when stored at 4 °C.

References

1. Handbook of Toxic Fungal Metabolites, Cole, R. J., and Cox, R. H., Academic Press (New York, NY: 1981).
2. Aflatoxin, Goldblatt., L. A., ed., Academic Press (New York, NY: 1969).

3. Buchi, G. and Weinreb, S. M., Total syntheses of aflatoxins M1 and G1 and an improved synthesis of aflatoxin B1. J. Am. Chem. Soc., **93(3)**, 746-752 (1971).

4. DNA Repair and Mutagenesis, Friedberg, E. C., et al., ASM Press (Washington, DC: 1995).

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