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Product Information

Gossypol
from cotton seeds

Catalog Number **G8761**
Storage Temperature 2–8 °C

CAS RN 303-45-7
Synonym: 2,2′-bis(8-Formyl-1,6,7-trihydroxy-5-isopropyl-3-methylnaphthalene)

Product Description
Molecular Formula: $C_{30}H_{30}O_8$
Molecular Weight: 518.55
λ_{max}: 358 nm (cyclohexane)[1]

Gossypol is a poisonous pigment found in cottonseed and its name is derived from the botanical name of the cotton plant species, *Gossypium*. This product is extracted from selected hybrid species between two *Gossypium* species: *Gossypium hirsutum* and *Gossypium barbadens*.

The toxicity of gossypol is shown against the reproductive system, heart, liver, and membranes. The compound exhibits both pro- and antioxidant behavior. Electron transfer (ET) functionalities, present in gossypol and its metabolites, comprise conjugated dicarbonyl, a quinone derivative, Schiff bases, and metal complexes. The parent possesses a reduction potential favorable for *in vivo* ET. Considerable evidence points to oxidative stress, formation of a reactive oxygen species, and DNA scission, characteristics of redox cycling by ET in biosystems, as mechanism of action for gossypol.[2]

The combined use of steroid hormones (methyl-testosterone and ethinyl estradiol) and gossypol (low dose) in an antifertility study in rats showed the steroid hormone made the procedure of spermatogenesis slower and low dose gossypol caused all sperm to lose their activity in the epididymis. Both affect the process of spermatogenesis from different endpoints and successfully induce infertility in the short term. A low dose of gossypol not only executes antifertility function in the epididymis, but also affects the quality of spermatozoal production in testis by impacting the procedures of both acrosomal formation and spermatozoal elongation. This assists in maintaining long term infertility.[3]

Gossypol, as a PAF antagonist/inhibitor, markedly inhibited the contractile responses of guinea-pig lung parenchyma strips stimulated with leukotriene B_4, leukotriene D_4, and PAF-acether. It was suggested the inhibition of the myotropic activity of the lung parenchyma by gossypol is due to interactions with the formation of cyclooxygenase products within the guinea-pig lung.[4]

In a study on the apoptotic effect of gossypol on human lymphocytes, gossypol was used at 20–50 μM to induce apoptosis in human lymphocytes without causing necrosis through cytotoxic effects.[5]

Purity: ≥95%

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions
This product is soluble in acetone and methanol (5 mg/ml) yielding a clear to very slightly hazy, yellow to amber solution. Gossypol is insoluble in water, very slightly soluble in petroleum ether, and soluble in ethanol, ether, chloroform, and DMF. It is freely soluble (with slow decomposition) in dilute aqueous solutions of ammonia and sodium carbonate.[6]

The deomposition rate of gossypol is lower in acetone than in other organic solvents such as methanol, chloroform, ethanol, and acetonitrile.[7]

Storage/Stability
Store the product at 2–8 °C.

References

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4. Touvay, C. et al., Gossypol: a potent inhibitor of PAF-acether- and leukotriene-induced contractions of guinea-pig lung parenchyma strips. J. Pharm. Pharmacol., **39(6)**, 454-458 (1987).
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6. The Merck Index, 12th ed., Entry #4549.
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