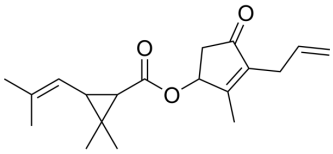
Allethrin

Cat. No.:	HY-B1559
CAS No.:	584-79-2
Molecular Formula:	$C_{19}H_{26}O_3$
Molecular Weight:	302.41
Target:	Apoptosis
Pathway:	Apoptosis
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Allethrin, a pyrethroid insecticide is a major mosquito repellent agent. Allethrin induces oxidative stress, apoptosis and calcium release in rat testicular carcinoma cells (LC540). Allethrin induces BCL-2, caspase-3 activation and release of intracellular calcium[1].

In Vitro

Allethrin (0.001-250 μM) induces cytotoxicity and oxidative stress. Allethrin is cytotoxic to isolated Leydig cells and testicular cancer cells. Cytotoxicity is due to free radical generation and altered antioxidant status[1].
Morphological analyses of LC540 cells treated with Allethrin (125 μM) reveals the presence of apoptotic bodies[1].
Allethrin (125 μM) induces BCL-2, caspase-3 activation and release of intracellular calcium[1].
Allethrin (IC_{50}≈85 μM) is toxic to human corneal epithelial (HCE) cells causing death through mitochondrial pathway[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Cytotoxicity Assay[1]

Cell Line:	LC540 cells (derived from rat Leydig cell tumor)
Concentration:	0.001-250 μM
Incubation Time:	24 hours
Result:	At low concentrations did not display appreciable cell killing activity up to 50 μM when incubated for 24 h. At concentrations above 100 μM, cell killing was observed. Based on the results obtained, the IC_{50} was 125 μM.

Apoptosis Analysis[1]

Cell Line:	LC540 cells
Concentration:	125 μM
Incubation Time:	24 hours
Result:	Revealed the presence of apoptotic bodies. The percentage of cells displaying early apoptotic features increased significantly.

Western Blot Analysis[1]

Cell Line:	LC540 cells
Concentration:	125 μM
Incubation Time:	0, 3, 6, 9, 12, 24 hours
Result:	BCL-2, pro-Caspase-3 and PARP-1 protein expression decreased significantly with an increase in cleaved PARP-1 levels.

In Vivo

Adult male rats are treated orally with Allethrin (25, 50, 100, and 150 mg/kg; every day for 60 days). Lipid peroxidation is increased in the caput, cauda, and testes. Nitric oxide production is increased in the caput, but unaltered in the cauda and testes. The activities of catalase, glutathione peroxidase (GPx), glutathione-S-transferase (GST), and superoxide dismutase (SOD) are decreased in the caput and cauda[3].

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Animal Model:	Male Wistar rats aged 90 days[3]
Dosage:	25, 50, 100, and 150 mg/kg
Administration:	Orally administered every day for 60 days
Result:	Increased levels of LPO products were observed in the caput, cauda, and testes of allethrin treated rats. In the caput, increased levels of NO was observed at all the doses tested, when compared with the vehicle treated control. Significant increase in catalase activity was observed in the cauda obtained from 50, 100, and 150 mg/kg. GPx activity was significantly increased in the caput obtained from 150 mg/kg treated rats. In the cauda, it was found to be increased significantly in the 50 and 100 mg/kg treated groups. In contrast, the activity of GPx activity was significantly decreased in the testes of rats treated with 150 mg/kg. GST activity was found to be increased significantly in a dose dependent manner in the caput and cauda of allethrin treated rats. In the caput, significant increase in the activity of SOD was observed in the 150 mg/kg body treated rats. In the cauda and testes, treatment resulted in increase of SOD activity at all the doses tested.

REFERENCES

[1]. Golla Madhubabu, et al. Allethrin induces oxidative stress, apoptosis and calcium release in rat testicular carcinoma cells (LC540). Toxicol In Vitro. 2014 Dec;28(8):1386-95.

[2]. Geetika Gupta, et al. Allethrin toxicity on human corneal epithelial cells involves mitochondrial pathway mediated apoptosis. Toxicol In Vitro. 2013 Dec;27(8):2242-8.

[3]. Golla Madhubabu, et al. Allethrin induced toxicity in the male reproductive tract of rats contributes to disruption in the transcription of genes involved in germ cell production. Environ Toxicol. 2014 Nov;29(11):1330-45.

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

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