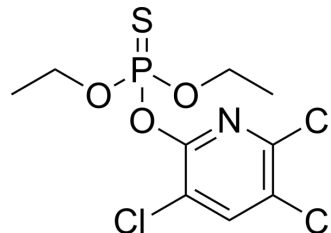


Chlorpyrifos

Cat. No.:	HY-B0815
CAS No.:	2921-88-2
Molecular Formula:	C ₉ H ₁₁ Cl ₃ NO ₃ PS
Molecular Weight:	350.59
Target:	Cholinesterase (ChE)
Pathway:	Neuronal Signaling
Storage:	4°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro	H ₂ O : 100 mg/mL (285.23 mM; Need ultrasonic)					
	DMSO : 50 mg/mL (142.62 mM; Need ultrasonic)					
	Preparing Stock Solutions	Solvent	Mass	1 mg	5 mg	10 mg
		Concentration				
		1 mM		2.8523 mL	14.2617 mL	28.5233 mL
5 mM			0.5705 mL	2.8523 mL	5.7047 mL	
	10 mM		0.2852 mL	1.4262 mL	2.8523 mL	
Please refer to the solubility information to select the appropriate solvent.						
In Vivo	1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: ≥ 6.25 mg/mL (17.83 mM); Clear solution					
	2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: 2.5 mg/mL (7.13 mM); Suspended solution; Need ultrasonic					
	3. Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 2.5 mg/mL (7.13 mM); Clear solution					

BIOLOGICAL ACTIVITY

Description	Chlorpyrifos is a neurotoxic insecticide that belongs to the class of thionite esters. Chlorpyrifos is also a AChE inhibitor that affects neurological function in insects, humans and other animals. Chlorpyrifos interferes with cell replication and differentiation, ultimately altering synaptic transmission in neurons ^{[1][2][3][4]} .
IC₅₀ & Target	AChE
In Vitro	Chlorpyrifos mediates desulfuration to produce chlorpyrifos oxon (CPO), which has higher affinity toward the active site of serine-dependent ester hydrolases such as AChE ^[2] .

Chlorpyrifos (3.9-250 μ M; 24-72 h) is toxic to oligodendrocyte progenitors^[3].

Chlorpyrifos toxicity is associated with (7.5-480 μ M; 18 h) nuclear condensation and elevation of caspase 3/7 activity, (60 μ M; 2, 4 h) Heme oxygenase-1 mRNA expression in Central Glia (CG-4) cells, and (30, 60, 120 μ M; 24 h) enhances H₂DCF-DA intensity^[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay^[3]

Cell Line:	Oligodendrocyte CG-4 cells
Concentration:	3.9, 7.8, 15.6, 31.25, 62.5, 125, and 250 μ M
Incubation Time:	24, 48, and 72 hours
Result:	Significantly inhibited cell viability over 62.5 μ M.

Immunofluorescence^[3]

Cell Line:	Oligodendrocyte CG-4 cells
Concentration:	0, 30, 60, 120 μ M
Incubation Time:	24 hours
Result:	Resulted nuclear condensation and elevation in a dose-dependent manner.

In Vivo

Chlorpyrifos (97-276 mg/kg; p.o.; single dose) has moderately acute oral toxicity, with lethal dose, 50% (LD₅₀) of 97-276 mg/kg in rats^[2].

Chlorpyrifos (1 mg/kg and 5 mg/kg for 1 mL/kg; s.c.; once daily for 3 d) has adverse effect on learning and memory abilities of rats, and affects pregnant rats on gestational days 9-12, results offspring behavioral abnormalities^[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Chemosphere. 2022 Jan 4;133522.

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REFERENCES

[1]. Silva MH. Effects of low-dose chlorpyrifos on neurobehavior and potential mechanisms: A review of studies in rodents, zebrafish, and *Caenorhabditis elegans*. Birth Defects Res. 2020 Apr 1;112(6):445-479.

[2]. Choi K, et al. Metabolism of chlorpyrifos and chlorpyrifos oxon by human hepatocytes. J Biochem Mol Toxicol. 2006;20(6):279-91.

[3]. Saulsbury MD, et al. Chlorpyrifos induces oxidative stress in oligodendrocyte progenitor cells. Toxicology. 2009 May 2;259(1-2):1-9.

[4]. Icenogle LM, et al. Behavioral alterations in adolescent and adult rats caused by a brief subtoxic exposure to chlorpyrifos during neurulation. Neurotoxicol Teratol. 2004 Jan-Feb;26(1):95-101.

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

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