Product Data Sheet

Product Name: Triclosan
Cat. No.: GC13311

Chemical Properties

Cas. No.	3380-34-5		
Chemical Name	5-chloro-2-(2,4-dichlorophenoxy)-phenol		
SMILES	ClC1=C(OC2=CC=C(Cl)C=C2O)C=CC(Cl)=C1		
Formula	$C_{12}H_7Cl_3O_2$	M.Wt	289.5
Solubility	≥ 10.95mg/mL in DMSO	Storage	4°C, protect from light
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	Triclosan		

Protocol

Cell experiment [1]:

Cell lines	Neural stem cells

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Preparation Method	Neural stem cells were cultured from embryonic day 14 (E14) brain of Sprague-Dawley rat. In brief, cortices were dissociated into single cells by mechanical trituration, and cells were incubated in DMEM/F12 supplemented with B27-serum free supplement and growth factor (10ng/ml FGF and 20ng/ml EGF) in a 5% CO_2 incubator. EGF and FGF were added every day and the cells grew into floating neurospheres, which were dissociated into single cells using trypsin-EDTA (0.1%) and plated into poly-L-ornithine pre-coated plates using B27- medium without growth factors for differentiation. Neural stem wells were treated in vitro with Triclosan at 1, 10, 20, 30, 50 and 100μM concentrations and applied into the culture media at different lengths of exposure (3, 6, 8, 12 and 24h) to determine the dose and time-dependent effects. All drug treatments and experiments were conducted during the 4th day of in vitro culture (DIV4) of NSCs. To evaluate neuronal cell death in culture Triclosan treatment, PI staining was performed. MTT assay was used to examine whether Triclosan treatment can influence NSC proliferation.
Reaction Conditions	1-100μM; 1-24h
Applications	Triclosan decreased cell viability and induced cell apoptosis in a dose- and time-dependent manner in rat neural stem cells (NSCs).

Animal experiment [2]:

Animal models	Adult male Sprague-Dawley rats

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Preparation Method	24 adult male Sprague-Dawley rats (56 days old) rats were housed in cages free from Triclosan following a one-week acclimatization period, under the conditions of temperature maintained at 23±2℃, humidity levels ranging from 45% to 55%, and a 12h-12h light-dark cycle. The rats were randomly divided into four groups consisting of 6 rats in each group: control group (corn oil), 50mg/kg/day, 100mg/kg/day, and 200mg/kg/day Triclosan groups. Each dose of Triclosan was mixed with 1ml of corn oil and administered to the rats at a rate of 1ml per kilogram of body weight. The administration regimen for the rats extended from postnatal day (PND) 56 to PND 63, a timeframe that aligns with the transition to adulthood. This period was selected to assess the potential effects of Triclosan exposure during a critical developmental window on subsequent hormonal regulation. The body weight of each rat was recorded throughout the study. At the end of the Triclosan exposure period, the rats were euthanized using CO_2 followed by cervical dislocation. Trunk blood was collected, centrifuged at 1500×g for 10min to obtain serum. The testes and epididymis were removed and weighed. One testis was stored at -80℃ for mRNA and protein analysis, while the other testis was fixed in Bouin’s fixative for immunohistochemistry. Sperm counting was performed using the cauda epididymis.
Dosage form	50-200mg/kg/day; p.o.; 7 days
Applications	Triclosan significantly reduced serum testosterone levels, downregulated the expression of Leydig cell genes involved in testosterone biosynthesis in adult male rats.

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References:
[1] Park BK, Gonzales EL, Yang SM, Bang M, Choi CS, Shin CY. Effects of Triclosan on Neural Stem Cell Viability and Survival. *Biomol Ther (Seoul)*. 2016;24(1):99-107.
[2] Sang J, Ji Z, Li H, et al. Triclosan inhibits testosterone biosynthesis in adult rats via inducing m6A methylation-mediated autophagy. *Environ Int*. 2024;190:108827.

Background

Triclosan is a broad-spectrum antibacterial agent[1]. Triclosan inhibits bacterial fatty acid synthesis at the enoyl-acyl carrier protein reductase (FabI) step[2]. Triclosan is commonly used for antibacterial research and is widely found in daily necessities such as soaps, detergents, toys, and surgical cleaning treatments[3][4].

In vitro, Triclosan (1-100μM; 1-24h) decreased cell viability and induced cell apoptosis in

a dose- and time-dependent manner in rat neural stem cells (NSCs)[5].

In vivo, Triclosan (50-200mg/kg/day; p.o.; 7 days) significantly reduced serum testosterone levels, downregulated the expression of Leydig cell genes involved in testosterone biosynthesis in adult male rats[6]. Triclosan (80ppm in diet; 4 weeks) increased the severity of dextran sodium sulfate (DSS)-induced colitis, and promoted colonic inflammation and immune cell infiltration in mice[7].

References:
[1] Vosatka R, Kratky M, Vinsova J. Triclosan and its derivatives as antimycobacterial active agents. *Eur J Pharm Sci*. 2018;114:318-331.
[2] Heath RJ, Rubin JR, Holland DR, Zhang E, Snow ME, Rock CO. Mechanism of triclosan inhibition of bacterial fatty acid synthesis. *J Biol Chem*. 1999;274(16):11110-11114.
[3] Shrestha P, Zhang Y, Chen WJ, Wong TY. Triclosan: antimicrobial mechanisms, antibiotics interactions, clinical applications, and human health. *J Environ Sci Health C Toxicol Carcinog*. 2020;38(3):245-268.
[4] Weatherly LM, Gosse JA. Triclosan exposure, transformation, and human health effects. *J Toxicol Environ Health B Crit Rev*. 2017;20(8):447-469.
[5] Park BK, Gonzales EL, Yang SM, Bang M, Choi CS, Shin CY. Effects of Triclosan on Neural Stem Cell Viability and Survival. *Biomol Ther (Seoul)*. 2016;24(1):99-107.
[6] Sang J, Ji Z, Li H, et al. Triclosan inhibits testosterone biosynthesis in adult rats via inducing m6A methylation-mediated autophagy. *Environ Int*. 2024;190:108827.
[7] Zhang J, Walker ME, Sanidad KZ, et al. Microbial enzymes induce colitis by reactivating triclosan in the mouse gastrointestinal tract. *Nat Commun*. 2022;13(1):136.