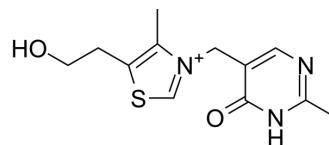


## Oxythiamine

<b>Cat. No.:</b>	HY-107430
<b>CAS No.:</b>	136-16-3
<b>Molecular Formula:</b>	C <sub>12</sub> H <sub>16</sub> N <sub>3</sub> O <sub>2</sub> S
<b>Molecular Weight:</b>	266.34
<b>Target:</b>	Apoptosis; Endogenous Metabolite
<b>Pathway:</b>	Apoptosis; Metabolic Enzyme/Protease
<b>Storage:</b>	-20°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



### SOLVENT & SOLUBILITY

<b>In Vitro</b>	DMSO : 51.67 mg/mL (194.00 mM; Need ultrasonic)					
		Solvent Concentration	Mass	1 mg	5 mg	10 mg
	<b>Preparing Stock Solutions</b>	1 mM	3.7546 mL	18.7730 mL	37.5460 mL	
		5 mM	0.7509 mL	3.7546 mL	7.5092 mL	
		10 mM	0.3755 mL	1.8773 mL	3.7546 mL	
Please refer to the solubility information to select the appropriate solvent.						
<b>In Vivo</b>	<ol style="list-style-type: none"> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 40% PEG300 &gt;&gt; 5% Tween-80 &gt;&gt; 45% saline Solubility: ≥ 2.58 mg/mL (9.69 mM); Clear solution</li> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.58 mg/mL (9.69 mM); Clear solution</li> <li>Add each solvent one by one: 10% DMSO &gt;&gt; 90% corn oil Solubility: ≥ 2.58 mg/mL (9.69 mM); Clear solution</li> </ol>					

### BIOLOGICAL ACTIVITY

<b>Description</b>	Oxythiamine (Hydroxythiamin), an analogue of anti-metabolite, can suppress the non-oxidative synthesis of ribose and induce cell apoptosis. Oxythiamine is a thiamine antagonist and inhibits transketolase (TK). Oxythiamine inhibits cancer cell apoptosis and inhibits cell proliferation <sup>[1][2][3]</sup> .
<b>IC<sub>50</sub> &amp; Target</b>	Vitamin B1, Thiamine, Transketolase <sup>[1]</sup> .
<b>In Vitro</b>	Oxythiamine (0-40 μM, 2 days) inhibits cell viability of MIA PaCa-2 cells (IC <sub>50</sub> : 14.95 μM) <sup>[1]</sup> . Oxythiamine chloride hydrochloride (0-500 μM, 48 h) suppresses expression of 14-3-3 protein beta/alpha in MIA PaCa-2 cells <sup>[1]</sup> .

Oxythiamine (0.1-100  $\mu$ M, 6-48 h) inhibits A549 cell proliferation<sup>[3]</sup>.  
Oxythiamine (0.1-100  $\mu$ M, 24 h) induces A549 cell apoptosis<sup>[3]</sup>.  
Oxythiamine (0-20  $\mu$ M) inhibits the invasion and migration (IC<sub>50</sub>: 8.75  $\mu$ M) of Lewis lung carcinoma (LLC) cells<sup>[4]</sup>.  
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

#### Cell Viability Assay<sup>[1]</sup>

Cell Line:	MIA PaCa-2 cells
Concentration:	0-40 $\mu$ M
Incubation Time:	2 days
Result:	Inhibited cell viability with an IC <sub>50</sub> of 14.95 $\mu$ M.

#### Western Blot Analysis<sup>[1]</sup>

Cell Line:	MIA PaCa-2 cells
Concentration:	0, 5, 50, 500 $\mu$ M
Incubation Time:	48 h
Result:	Inhibited 14-3-3 protein beta/alpha expression, and increased alpha-enolase.

#### In Vivo

Oxythiamine (100-500 mg/kg, i.p. 4 days) inhibits tumor growth in Ehrlich's ascites tumor hosting mice<sup>[2]</sup>.  
Oxythiamine (250 or 500 mg/kg, daily for 5 week) inhibits tumor cell metastasis via inhibition of MMPs in mice implanted (s.c.) with LLC cells<sup>[4]</sup>.  
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Ehrlich's ascites tumor hosting mice <sup>[2]</sup>
Dosage:	100-500 mg/kg
Administration:	i.p., 4 days
Result:	Inhibited tumor growth by 43% at 300 mg/kg and 84% at 500 mg/kg.

## CUSTOMER VALIDATION

- Nat Commun. 2022 Oct 17;13(1):6121.

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## REFERENCES

- [1]. Wang J, et al. Inhibition of transketolase by oxythiamine altered dynamics of protein signals in pancreatic cancer cells. *Exp Hematol Oncol*. 2013 Jul 27;2:18.
- [2]. Rais B, et al. Oxythiamine and dehydroepiandrosterone induce a G1 phase cycle arrest in Ehrlich's tumor cells through inhibition of the pentose cycle. *FEBS Lett*. 1999 Jul 30;456(1):113-8.
- [3]. Bai L, et al. A dose- and time-dependent effect of oxythiamine on cell growth inhibition in non-small cell lung cancer. *Cogn Neurodyn*. 2022 Jun;16(3):633-641.
- [4]. Yang CM, et al. The in vitro and in vivo anti-metastatic efficacy of oxythiamine and the possible mechanisms of action. *Clin Exp Metastasis*. 2010 May;27(5):341-9.

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

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