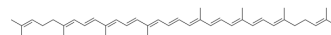


## Lycopene

Cat. No.:	HY-N0287
CAS No.:	502-65-8
Molecular Formula:	C <sub>40</sub> H <sub>56</sub>
Molecular Weight:	536.87
Target:	Reactive Oxygen Species; Endogenous Metabolite
Pathway:	Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB
Storage:	-80°C, protect from light, stored under nitrogen



### SOLVENT & SOLUBILITY

#### In Vitro

THF : 5 mg/mL (9.31 mM; Need ultrasonic)  
 Ethanol : < 1 mg/mL (ultrasonic) (insoluble)

Solvent	Mass	Concentration		
		1 mg	5 mg	10 mg
Preparing Stock Solutions	1 mM	1.8626 mL	9.3132 mL	18.6265 mL
	5 mM	0.3725 mL	1.8626 mL	3.7253 mL
	10 mM	---	---	---

Please refer to the solubility information to select the appropriate solvent.

### BIOLOGICAL ACTIVITY

#### Description

Lycopene is naturally occurring carotenoids found in tomato, tomato products, and in other red fruits and vegetables; exhibits antioxidant effects.

#### IC<sub>50</sub> & Target

Human Endogenous Metabolite

#### In Vitro

Sufficient uptake of lycopene from the diet is necessary to benefit from its health promoting effects, since humans are unable to synthesise lycopene de novo. Lycopene significantly inhibits prostate and breast cancer cell growth at physiologically relevant concentrations of 1.25 μM and also causes a 30-40 % reduction in inhibitor of kappa B phosphorylation in the cells<sup>[1]</sup>.

Increased intake of lycopene, a major carotenoid in tomatoes, consumed as the all-trans-isomer attenuates alcohol induced apoptosis in 2E1 cells and reduces risk of prostate, lung and digestive cancers. Lycopene plays a role in the protection against photooxidative processes by acting as singlet molecular oxygen and peroxy radicals scavengers and can interact synergistically with other antioxidants<sup>[2]</sup>.

Lycopene as a carotenoid can react with types of reactive oxygen species (ROS) in three different mechanisms: I) by electron-transfer, II) by hydrogen atom transfer or III) by adduct formation. Lycopene is able to deactivate singlet oxygen mainly by physical quenching<sup>[3]</sup>.

Lycopene decreases ROS production in SK-Hep-1 cells through inhibition of NADPH oxidase, brought about in the PKC pathway<sup>[5]</sup>.

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

#### In Vivo

Lycopene is the most predominant carotenoid in human plasma and has a half life of about 2-3 days<sup>[2]</sup>.

Lycopene or processed tomatoes may lead to a reduction of intima-media thickness in vessel walls<sup>[3]</sup>.

Lycopene exerts protective effects against ATZ-induced toxicity in rat adrenal cortex. These effects may be attributed to the antioxidative property of lycopene and its ability to activate the Nrf2/HO-1 pathway<sup>[4]</sup>.

Lycopene improves hepatotoxicity acting as an antioxidant, reduces GSSG and regulates tGSH and CAT levels, reduces oxidative damage<sup>[5]</sup>.

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

## PROTOCOL

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

PC3 cells and MDA-MB-231 cells are treated with (0, 0.5, 1.25, 2.5 and 5  $\mu$ M) lycopene for 48 h. Cell survival/growth is measured using the colorimetric MTS assay method. MTS-PMS complex (20  $\mu$ L) is added to each well. The catalytic activity of viable cells results in formazan dye production, which is then quantified. Cells are incubated with the dye for 1 h, followed by absorbance reading at 492 nm on a spectrophotometer<sup>[1]</sup>.

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

#### Animal Administration <sup>[4]</sup>

Rats: Lycopene is dissolved in corn oil. 35 adult male albino rats are randomized into five equal groups: untreated control, vehicle control (receives 0.5 mL corn oil/day), lycopene (10 mg/kg b.w./day), ATZ (dissolved in 0.5 mL corn oil 300 mg/kg b.w./day), and ATZ + lycopene. All treatments are given by oral gavage for 4 weeks<sup>[4]</sup>.

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

## CUSTOMER VALIDATION

- Redox Biol. 2020 Sep;36:101601.
- J Funct Foods. 2024 Feb, 113, 106021.
- Drug Des Devel Ther. 2023 Oct 12.
- Fish Shellfish Immunol. 2023 Jun 8;108897.
- J Neurosci Res. 2019 Dec;97(12):1689-1705.

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## REFERENCES

[1]. Assar EA, et al. Lycopene acts through inhibition of I $\kappa$ B kinase to suppress NF- $\kappa$ B signaling in human prostate and breast cancer cells. *Tumour Biol.* 2016 Jul;37(7):9375-85.

[2]. Tapiero H, et al. The role of carotenoids in the prevention of human pathologies. *Biomed Pharmacother.* 2004 Mar;58(2):100-10.

[3]. Müller L, et al. Lycopene and Its Antioxidant Role in the Prevention of Cardiovascular Diseases-A Critical Review. *Crit Rev Food Sci Nutr.* 2016 Aug 17;56(11):1868-79.

[4]. Abass MA, et al. Lycopene ameliorates atrazine-induced oxidative damage in adrenal cortex of male rats by activation of the Nrf2/HO-1 pathway. *Environ Sci Pollut Res Int.* 2016 Aug;23(15):15262-74.

[5]. Bandeira AC, et al. Lycopene inhibits reactive oxygen species production in SK-Hep-1 cells and attenuates acetaminophen-induced liver injury in C57BL/6 mice. *Chem*

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

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