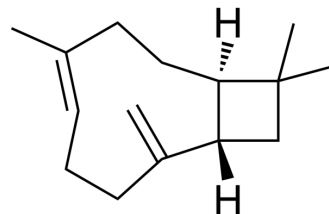


## β-Caryophyllene

<b>Cat. No.:</b>	HY-N1415		
<b>CAS No.:</b>	87-44-5		
<b>Molecular Formula:</b>	C <sub>15</sub> H <sub>24</sub>		
<b>Molecular Weight:</b>	204.35		
<b>Target:</b>	Cannabinoid Receptor; Endogenous Metabolite		
<b>Pathway:</b>	GPCR/G Protein; Neuronal Signaling; Metabolic Enzyme/Protease		
<b>Storage:</b>	Pure form	-20°C	3 years
		4°C	2 years
	In solvent	-80°C	6 months
		-20°C	1 month



### SOLVENT & SOLUBILITY

#### In Vitro

Ethanol : ≥ 176.67 mg/mL (864.55 mM)  
 DMSO : 25 mg/mL (122.34 mM; Need ultrasonic)  
 H<sub>2</sub>O : < 0.1 mg/mL (insoluble)  
 \* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	4.8936 mL	24.4678 mL	48.9356 mL
	5 mM	0.9787 mL	4.8936 mL	9.7871 mL
	10 mM	0.4894 mL	2.4468 mL	4.8936 mL

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

#### In Vivo

- Add each solvent one by one: PBS  
Solubility: 100 mg/mL (489.36 mM); Clear solution; Need ultrasonic
- Add each solvent one by one: 10% EtOH >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
Solubility: ≥ 13.25 mg/mL (64.84 mM); Clear solution
- Add each solvent one by one: 10% EtOH >> 90% (20% SBE-β-CD in saline)  
Solubility: 13.25 mg/mL (64.84 mM); Suspended solution; Need ultrasonic
- Add each solvent one by one: 10% EtOH >> 90% corn oil  
Solubility: ≥ 13.25 mg/mL (64.84 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
Solubility: ≥ 2.5 mg/mL (12.23 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 2.5 mg/mL (12.23 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 2.5 mg/mL (12.23 mM); Clear solution

## BIOLOGICAL ACTIVITY

<b>Description</b>	$\beta$ -Caryophyllene is a CB2 receptor agonist.
<b>IC<sub>50</sub> &amp; Target</b>	Human Endogenous Metabolite
<b>In Vitro</b>	<p>Among the tested cancer cells, <math>\beta</math>-Caryophyllene demonstrates selective anti-proliferative effect against three cancer cell lines, namely HCT 116 (colon cancer, IC<sub>50</sub>=19 <math>\mu</math>M), PANC-1 (pancreatic cancer, IC<sub>50</sub>=27 <math>\mu</math>M), and HT29 (colon cancer, IC<sub>50</sub>=63 <math>\mu</math>M) cells, whereas <math>\beta</math>-Caryophyllene exhibits either moderate or poor cytotoxic effects against ME-180, PC3, K562 and MCF-7. Results show that <math>\beta</math>-Caryophyllene possesses higher selectivity towards the colorectal cancer cells (HCT 116), with selectivity index (SI)=27.9, followed by PANC-1 and HT 29 cells with SI=19.6 and 8, respectively. The apoptotic index estimated for <math>\beta</math>-Caryophyllene treatment on HCT 116 cells after 24 h treatment is 64<math>\pm</math>0.04. <math>\beta</math>-Caryophyllene at 10 <math>\mu</math>M concentration, causes significant nuclei condensation after 6 h of treatment. <math>\beta</math>-caryophyllene exhibits a dose and time-dependent inhibitory effect on the motility of HCT 116 cells<sup>[2]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>
<b>In Vivo</b>	<p>Treatment with <math>\beta</math>-Caryophyllene at different doses does not show any effects on swimming speed during the test. Oral treatment with <math>\beta</math>-Caryophyllene ameliorates the rise in <math>\beta</math>-amyloid deposition in the transgenic mice in a roughly dose-dependent manner, and the two higher doses exhibit almost equal effects in modifying the <math>\beta</math>-amyloid burden. The number of activated astroglial cells is higher in vehicle-treated mouse brains than in <math>\beta</math>-Caryophyllene-treated mouse brains with different doses. <math>\beta</math>-Caryophyllene is effective at reducing the enhancement of the COX-2 protein level found in vehicle-treated APP/PS1 mice<sup>[1]</sup>. Animals treated with <math>\beta</math>-Caryophyllene display higher values of object recognition index than their vehicle-treated counterparts [t(14)=4.204, P&lt;0.05]. The total time spent in object exploration during the test trial is not significantly different between <math>\beta</math>-Caryophyllene-treated and vehicle-treated animals (t(14)=0.5874, P&gt;0.05). Treatment with <math>\beta</math>-Caryophyllene does not significantly alter these seizure-induced neurochemical changes<sup>[3]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

## PROTOCOL

<b>Cell Assay</b> <sup>[2]</sup>	<p>Panel of human cancer cells such as, pancreatic (PANC-1), colorectal (HCT-116 and HT-29), invasive squamous cell carcinoma (ME-180), leukemia (K562), hormone sensitive and invasive breast cancer cell line (MCF-7), and prostatic (PC3) adenocarcinoma cell lines are used. Cells are incubated in a humidified CO<sub>2</sub> incubator at 37°C supplied with 5% CO<sub>2</sub>. Inhibitory effect of <math>\beta</math>-Caryophyllene on proliferation of the cell lines is tested using the MTT assay. The selectivity index (SI) for the cytotoxicity of <math>\beta</math>-Caryophyllene is calculated using the ratio of IC<sub>50</sub> of <math>\beta</math>-Caryophyllene on a normal cell line (NIH-3T3) to the IC<sub>50</sub> of <math>\beta</math>-Caryophyllene on cancer cell lines<sup>[2]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>
<b>Animal Administration</b> <sup>[1]</sup>	<p>Male double transgenic APP/PS1 mice and wild-type littermates are used. The mice are group housed (3 to 5 animals/cage) with a 12:12-hour light/dark cycle and ad libitum access to food and water. In this experiment, animals are orally treated by gavage with 16, 48, or 144 mg/kg of <math>\beta</math>-Caryophyllene every morning for 10 weeks starting at the age of 7 months. All vehicle solutions are used for the respective control animal treatments and the Morris water maze test is performed<sup>[1]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

## REFERENCES

- [1]. Cheng Y, et al.  $\beta$ -Caryophyllene ameliorates the Alzheimer-like phenotype in APP/PS1 Mice through CB2 receptor activation and the PPAR $\gamma$  pathway. *Pharmacology*. 2014;94(1-2):1-12.
- [2]. Dahham SS, et al. The Anticancer, Antioxidant and Antimicrobial Properties of the Sesquiterpene  $\beta$ -Caryophyllene from the Essential Oil of *Aquilaria crassna*. *Molecules*.

---

2015 Jun 26;20(7):11808-29.

[3]. de Oliveira CC, et al. Anticonvulsant activity of  $\beta$ -caryophyllene against pentylenetetrazol-induced seizures. *Epilepsy Behav.* 2016 Mar;56:26-31.

---

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: [tech@MedChemExpress.com](mailto:tech@MedChemExpress.com)

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA