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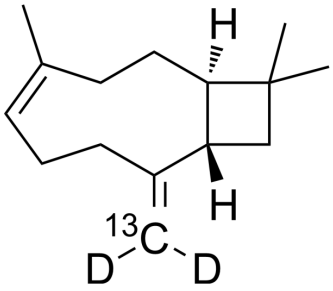
β-Caryophyllene-$^{13}C,d_2$

Cat. No.:	HY-N1415S1
Molecular Formula:	$C_{14}{}^{13}CH_{22}D_2$
Molecular Weight:	207.36
Target:	Endogenous Metabolite; Cannabinoid Receptor; Isotope-Labeled Compounds
Pathway:	Metabolic Enzyme/Protease; GPCR/G Protein; Neuronal Signaling; Others
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	β-Caryophyllene-$^{13}C,d_2$ is ^{13}C and deuterated labeled trans,trans-2,4-Decadienal (HY-W013627). trans,trans-2,4-Decadienal is a lipid peroxidation product of linolieic acid[1].
In Vitro	Stable heavy isotopes of hydrogen, carbon, and other elements have been incorporated into drug molecules, largely as tracers for quantitation during the drug development process. Deuteration has gained attention because of its potential to affect the pharmacokinetic and metabolic profiles of drugs[1]. Among the tested cancer cells, β-Caryophyllene demonstrates selective anti-proliferative effect against three cancer cell lines, namely HCT 116 (colon cancer, IC_{50}=19 μM), PANC-1 (pancreatic cancer, IC_{50}=27 μM), and HT29 (colon cancer, IC_{50}=63 μM) cells, whereas β-Caryophyllene exhibits either moderate or poor cytotoxic effects against ME-180, PC3, K562 and MCF-7. Results show that β-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 β-Caryophyllene treatment on HCT 116 cells after 24 h treatment is 64±0.04. β-Caryophyllene at 10 μM concentration, causes significant nuclei condensation after 6 h of treatment. β-caryophyllene exhibits a dose and time-dependent inhibitory effect on the motility of HCT 116 cells[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Treatment with β-Caryophyllene at different doses does not show any effects on swimming speed during the test. Oral treatment with β-Caryophyllene ameliorates the rise in β-amyloid deposition in the transgenic mice in a roughly dose-dependent manner, and the two higher doses exhibit almost equal effects in modifying the β-amyloid burden. The number of activated astroglial cells is higher in vehicle-treated mouse brains than in β-Caryophyllene-treated mouse brains with different doses. β-Caryophyllene is effective at reducing the enhancement of the COX-2 protein level found in vehicle-treated APP/PS1 mice[2]. Animals treated with β-Caryophyllene display higher values of object recognition index than their vehicle-treated counterparts [t(14)=4.204, P<0.05]. The total time spent in object exploration during the test trial is not significantly different between β-Caryophyllene-treated and vehicle-treated animals (t(14)=0.5874, P>0.05). Treatment with β-Caryophyllene does not significantly alter these seizure-induced neurochemical changes[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Cheng Y, et al. β-Caryophyllene ameliorates the Alzheimer-like phenotype in APP/PS1 Mice through CB2 receptor activation and the PPARγ pathway. Pharmacology. 2014;94(1-2):1-12.

[2]. Dahham SS, et al. The Anticancer, Antioxidant and Antimicrobial Properties of the Sesquiterpene β-Caryophyllenefrom the Essential Oil of Aquilaria crassna. Molecules. 2015 Jun 26;20(7):11808-29.

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

[4]. Russak EM, et al. Impact of Deuterium Substitution on the Pharmacokinetics of Pharmaceuticals. Ann Pharmacother. 2019 Feb;53(2):211-216.

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