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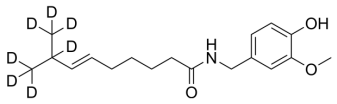
Capsaicin-d_7

Cat. No.:	HY-10448S4
Molecular Formula:	$C_{18}H_{20}D_7NO_3$
Molecular Weight:	312.46
Target:	TRP Channel; Autophagy; Endogenous Metabolite; Apoptosis; Isotope-Labeled Compounds
Pathway:	Membrane Transporter/Ion Channel; Neuronal Signaling; Autophagy; Metabolic Enzyme/Protease; Apoptosis; Others
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Capsaicin-d_7 is deuterated labeled Capsaicin (HY-10448). Capsaicin ((E)-Capsaicin), an active component of chili peppers, is a TRPV1 agonist. Capsaicin has pain relief, antioxidant, anti-inflammatory, neuroprotection and anti-cancer effects[1][2].
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]. Capsaicin (50-300 μM; 24-72 hours) shows an augmented decrease in cell growth in a dose- and time-dependent manner. The observed IC50 value is around 150 μM[3]. Capsaicin (50-300 μM; 24-72 hours) shows increase in cytosolic cytochrome c, activation of caspase 3 and PARP (p85) levels, and decreases anti-apoptotic Bcl-2 protein and increases pro-apoptotic Bad/Bax expression[3]. Capsaicin increases the nuclear condensation, nuclear DNA fragmentation and sub-G1 DNA content[3]. Capsaicin suppresses the cell cycle progression at the G1/S phase in FaDu cells by decreasing the expression of the regulators of cyclin B1 and D1, as well as cyclin-dependent protein kinases cdk-1, cdk-2 and cdk-4[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Capsaicin suppresses the development of lung carcinoma by amending the protein expressions of apoptotic regulators p53, Bcl-2, Bax and caspase-3[3]. Capsaicin (2 μg in 40 μL per mice, injected into the plantar surface of the left hind paw) induces pain-related behaviour in mice[5]. Capsaicin (3-30 μg in 10 μL per rat, plantar injection) induces secondary mechanical hypersensitivity (SMH) (used clinically as a model to potentially predict neuropathic pain) in rats[6]. Capsaicin (0-500 μg in 25 μL per rat, injected subcutaneously into the center of the right vibrissae pad) induces pain in the orofacial region or rats[7]. In high dose, Capsaicin may should be adminstered under anesthesia condition[8][9]. Capsaicin is more pungent than Dihydrocapsaicin (HY-N0361) [10]. Note: The spicy taste is choking, please take precautions. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. McNamara FN, et al. Effects of piperine, the pungent component of black pepper, at the human vanilloid receptor (TRPV1). Br J Pharmacol. 2005 Mar;144(6):781-90.

[2]. Anandakumar P, et al. Capsaicin provokes apoptosis and restricts benzo(a)pyrene induced lung tumorigenesis in Swiss albino mice. Int Immunopharmacol. 2013 Jun 6;17(2):254-259.

[3]. Shin YH, et al. The Effect of Capsaicin on Salivary Gland Dysfunction. Molecules. 2016 Jun 25;21(7).

[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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