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ProductInformation

Arachidonoyl Dopamine

Product Number **A 8848**
Storage Temperature –20 °C

Synonyms: AA-DA; N-[2,3-(4-dihydroxyphenyl)-ethyl]-5Z,8Z,11Z,14Z-eicosatetraenamide

Product Description
Molecular Formula: $C_{28}H_{41}NO_3$
Molecular Weight: 439.6
Absorbance: λ_{max}= 284 nm (ethanol)

Arachidonoyl Dopamine is a hybrid analog that incorporates components of the anandamide and capsaicin molecules. It is the amide of the neurotransmitter bioactive amine, dopamine, and the polyunsaturated fatty acid, arachidonic acid. AA-DA displays cannabimimetic activity *in vitro* and *in vivo* suggesting AA-DA may be a useful probe in the endogenous cannabinoid system which includes endogeneous agonists of cannabinoid receptor proteins.

AA-DA (and some other N-acyl-dopamines) competitively inhibits fatty acid amide hydrolase (IC_{50} = approx. 22 µM) from N18TG2 neuroblastoma cells and the binding (K_i= approx. 0.25 µM) of the selective cannabinoid receptor subtype 1 (CB_1) ligand, [^{3}H] SR141716A, to rat brain membrane. AA-DA also inhibits the anandamide membrane transporter in RBL-2H3 basophilic leukemia and C6 glioma cells.[1]

AA-DA has at least a 40 fold greater selectivity for CB_1 than CB_2 receptors in rat brain membranes.
AA-DA is shown to be more potent than anandamide as a CB_1 agonist in N18TG2 neuroblastoma cells. AA-DA induces hypothermia and immobility, decreases spontaneous activity and pain perception in mice and rats, which supports its action as a CB_1 agonist in vivo[1,2] AA-DA also inhibits (IC_{50} =approx. 0.25 µM) proliferation of human breast MCF-7 cancer cells.[1]

Precautions and Disclaimer
This product is for laboratory research only. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions
The product is supplied as a solution in ethanol. To change this solvent, evaporate the ethanol under a gentle stream of an inert gas such as argon or dry nitrogen and immediately add the solvent of choice. Solvents such as dimethyl sulfoxide (DMSO) and N,N-dimethylformamide (DMF) purged with an inert gas can be used. AA-DA is miscible in either solvent and the solution stability is at least 6 months if stored as frozen aliquots at –20 °C.

The stock solution should be further diluted into aqueous buffers or isotonic saline (ensure that the residual amount of organic solvent is not causing physiological effects at low concentrations of the organic solvent) for biological experiments. The product supplied in ethanol can be directly diluted into an aqueous buffer of choice for maximum solubility in aqueous buffers. AA-DA has a solubility of about 100 µg/ml forming a colloidal suspension in a solution of ethanol:PBS, pH 7.2 (1:100). Do not store aqueous solutions for more than one day.

Storage/Stability
The product is shipped on wet ice and should be stored at –20 °C. The product as supplied is stable for at least one year.

References
1. Bisogno, T. et al., N-acyl-dopamines:novel synthetic CB_1 cannabinoid-receptor ligands and inhibitors of anandamide inactivation with cannabimimetic activity *in vitro* and *in vivo*. Biochem. J., **351**, 817-824 (2000).
2. Bezuglove, V. et al., Synthesis and biological evaluation of novel amides of polyunsaturated fatty acids with dopamine. Bioorganic & Medicinal Chemistry Letters, **11**, 447-449 (2001).
3. Janusz, J.M., et al., J. Med. Chem., **36**, 2595-604 (1993).

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