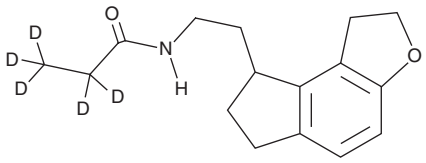
PRODUCT INFORMATION

Ramelteon-d_5

Item No. 25420

CAS Registry No.: 2699607-24-2
Formal Name: N-(2-(1,6,7,8-tetrahydro-2H-indeno[5,4-b]furan-8-yl)ethyl)propanamide-d_5
MF: $C_{16}H_{16}D_5NO_2$
FW: 264.4
Chemical Purity: ≥98% (Ramelteon)
Deuterium Incorporation: ≥99% deuterated forms (d_1-d_5); ≤1% d_0
Supplied as: A solid
Storage: -20°C
Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Ramelteon-d_5 is intended for use as an internal standard for the quantification of ramelteon (Item No. 20389) by GC- or LC-MS. The accuracy of the sample weight in this vial is between 5% over and 2% under the amount shown on the vial. If better precision is required, the deuterated standard should be quantitated against a more precisely weighed unlabeled standard by constructing a standard curve of peak intensity ratios (deuterated *versus* unlabeled).

Ramelteon-d_5 is supplied as a solid. A stock solution may be made by dissolving the ramelteon-d_5 in the solvent of choice, which should be purged with an inert gas. Ramelteon-d_5 is soluble in the organic solvent methanol.

Description

Ramelteon is a melatonin (MT) receptor agonist (K_is = 14, 112, and 23.1 pM for human MT_1, human MT_2, and chick forebrain receptors, respectively).[1] It is selective for MT_1 and MT_2 over MT_3 receptors (K_i = 2.65 µM for hamster brain MT_3 receptors) as well as a panel of benzodiazepine, dopamine, and opiate receptors, ion channels, transporters, and enzymes when used at a concentration of 10 µM. Ramelteon stimulates cAMP production in CHO cells expressing human MT_1 and MT_2 receptors (IC_{50}s = 21.2 and 53.4 pM, respectively). *In vivo*, ramelteon (0.03 and 0.3 mg/kg, p.o.) shortens latency to sleep onset and increases duration of sleep in free-moving crab-eating macaques.[2] It also accelerates reentrainment of circadian rhythm in rats, shifting running wheel activity back to the dark period 2.4 and 3 days more quickly than vehicle-treated animals following an eight-hour phase shift in the light-dark cycle when administered at 0.1 and 1 mg/kg, respectively, with no effect on learning and memory in the Morris water maze and delayed match-to-position tasks.[3]

References

1. Kato, K., Hirai, K., Nishiyama, K., *et al.* Neurochemical properties of ramelteon (TAK-375), a selective MT_1/MT_2 receptor agonist. *Neuropharmacology* **48(2)**, 301-310 (2005).
2. Yukuhiro, N., Kimura, H., Nishikawa, H., *et al.* Effects of ramelteon (TAK-375) on nocturnal sleep in freely moving monkeys. *Brain Res.* **1027(1-2)**, 59-66 (2004).
3. Hirai, K., Kita, M., Ohta, H., *et al.* Ramelteon (TAK-375) accelerates reentrainment of circadian rhythm after a phase advance of the light-dark cycle in rats. *J. Biol. Rhythms* **20(1)**, 27-37 (2005).

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