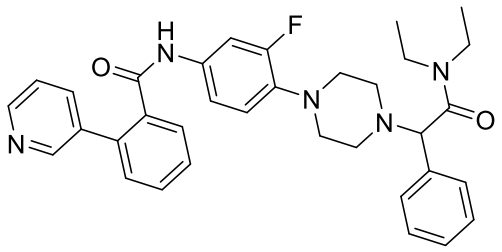
Product data sheet

MedKoo Cat#: 510336 Name: JNJ-31020028 CAS#: 1094873-14-9 (recemate) Chemical Formula: $C_{34}H_{36}FN_5O_2$ Exact Mass: 565.2853 Molecular Weight: 565.6	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:

JNJ-31020028 is a selective brain penetrant small molecule antagonist of the neuropeptide Y Y(2) receptor. JNJ-31020028 bound with high affinity (pIC(50) = 8.07 +/- 0.05, human, and pIC(50) = 8.22 +/- 0.06, rat) and was >100-fold selective versus human Y(1), Y(4), and Y(5) receptors. JNJ-31020028 was demonstrated to be an antagonist (pK(B) = 8.04 +/- 0.13) in functional assays. JNJ-31020028 occupied Y(2) receptor binding sites (approximately 90% at 10 mg/kg) after subcutaneous administration in rats. JNJ-31020028 increased norepinephrine release in the hypothalamus, consistent with the colocalization of norepinephrine and neuropeptide Y. In a variety of anxiety models, JNJ-31020028 was found to be ineffective, although it did block stress-induced elevations in plasma corticosterone, without altering basal levels, and normalized food intake in stressed animals without affecting basal food intake.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	44.0	77.79

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.77 mL	8.84 mL	17.68 mL
5 mM	0.35 mL	1.77 mL	3.54 mL
10 mM	0.18 mL	0.88 mL	1.77 mL
50 mM	0.04 mL	0.18 mL	0.35 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Shoblock JR, Welty N, Nepomuceno D, Lord B, Aluisio L, Fraser I, Motley ST, Sutton SW, Morton K, Galici R, Atack JR, Dvorak L, Swanson DM, Carruthers NI, Dvorak C, Lovenberg TW, Bonaventure P. In vitro and in vivo characterization of JNJ-31020028 (N-(4-{4-[2-(diethylamino)-2-oxo-1-phenylethyl]piperazin-1-yl}-3-fluorophenyl)-2-pyridin-3-ylbenzamide), a selective brain penetrant small molecule antagonist of the neuropeptide Y Y(2) receptor. Psychopharmacology (Berl). 2010 Feb;208(2):265-77. doi: 10.1007/s00213-009-1726-x. Epub 2009 Dec 2. PMID: 19953226.

In vivo study

1. Morales-Medina JC, Dumont Y, Bonaventure P, Quirion R. Chronic administration of the Y2 receptor antagonist, JNJ-31020028, induced anti-depressant like-behaviors in olfactory bulbectomized rat. Neuropeptides. 2012 Dec;46(6):329-34. doi: 10.1016/j.npep.2012.09.009. Epub 2012 Oct 25. PMID: 23103057.

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2. Seldeen KL, Halley PG, Volmar CH, Rodríguez MA, Hernandez M, Pang M, Carlsson SK, Suva LJ, Wahlestedt C, Troen BR, Brothers SP. Neuropeptide Y Y2 antagonist treated ovariectomized mice exhibit greater bone mineral density. Neuropeptides. 2018 Feb;67:45-55. doi: 10.1016/j.npep.2017.11.005. Epub 2017 Nov 7. PMID: 29129406; PMCID: PMC5805636.

7. Bioactivity

Biological target:

JNJ-31020028 is a selective brain penetrant antagonist of neuropeptide Y2 receptor with high affinity (pIC50=8.07, human; pIC50=8.22 rat); >100-fold selective versus human Y1/Y4/Y5 receptors.

In vitro activity

In this study, JNJ-47965567, a centrally permeable, high-affinity, selective P2X7 antagonist was characterized. A combination of in vitro assays (calcium flux, radioligand binding, electrophysiology, IL-1β release) were used in both recombinant and native systems. JNJ-47965567 is potent high affinity (pKi 7.9 ± 0.07), selective human P2X7 antagonist, with no significant observed speciation. In native systems, the potency of the compound to attenuate IL-1β release was 6.7 ± 0.07 (human blood), 7.5 ± 0.07 (human monocytes) and 7.1 ± 0.1 (rat microglia). JNJ-47965567 exhibited target engagement in rat brain, with a brain EC50 of 78 ± 19 ng·mL(-1) (P2X7 receptor autoradiography) and functional block of Bz-ATP induced IL-1β release.

Reference: Br J Pharmacol. 2013 Oct;170(3):624-40. https://pubmed.ncbi.nlm.nih.gov/23889535/

In vivo activity

To explore skeletal impacts of JNJ-31020028 treatment, bone mineral density was assessed in OVX mice using dual energy X-ray absorptiometry (DEXA). Representative whole-body scans from JNJ-31020028-treated and vehicle mice and the regions of interest are shown in Figure 3A. Bone mineral density (BMD) was significantly higher in Y2 antagonist-treated mice compared to mice receiving the vehicle control (p=0.045; 2-tailed t-test) (Figure 3B and Table 1). The BMD values observed for vehicle- and JNJ-31020028-treated OVX mice were within normal range (Delahunty et al., 2009). Correspondingly connectivity density (ConnD) and trabecular thickness (TB.Th) were also significantly greater in Y2 antagonist-treated mice compared to mice in the vehicle control group. Furthermore, treated mice exhibited lower structural model index (SMI), indicative of greater plate-like, as opposed to rod-like, composition within trabecular bone (Table 2). Analysis of femurs showed greater BV/TV within trabecular regions of Y2 antagonist-treated mice, which was associated with an increase in trabecular number and a reduction in trabecular separation (Figure 4, Table 2). Taken together, these data may indicate the Y2 antagonist slows bone metabolism in vivo.

Reference: Neuropeptides. 2018 Feb; 67: 45–55. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5805636/