Hello Bio, Inc. 304 Wall St., Princeton, NJ 08540 USA

T. 609-683-7500 F. 609-228-4994

customercare-usa@hellobio.com



# **DATASHEET**

Deschloroclozapine (DCZ)

#### **Product overview**

Name Deschloroclozapine (DCZ)

Cat No HB8555
Alternative names DCZ
Biological action Agonist
Purity >98%

**Description** Potent, selective and metabolically stable hM3Dq and hM4Di muscarinic DREADD actuator.

## **Images**



## **Biological Data**

#### **Biological description**

#### **Overview**

Deschloroclozapine (DCZ) is reported to be a potent, selective and highly brain-penetrable muscarinic hM3Dq and hM4Di DREADD actuator with minimal off-target actions ( $K_i = 6.3$  and 4.2 nM at hM3Dq and hM4Di respectively) and (EC<sub>50</sub> values are 0.13 and 0.081 nM at hM3Dq and hM4Di respectively in a BRET-based assay.

It represents a potent, selective, metabolically stable and fast acting DREADD agonist with utility in both mice and non-human primates for a variety of applications.

It shows 100-fold improved affinity and greater agonist potency for hM3Dq and hM4Di compared to Clozapine n-Oxide (CNO) or DREADD agonist 21 (C21) with reduced off-target binding compared with clozapine in vitro. It has lower affinity at  $D_1$ ,  $D_2$  and 5-HT<sub>2A</sub> and 5-HT<sub>2C</sub> receptors compared with clozapine.

PET studies demonstrate the compound is rapidly brain penetrable, is apparently selective and doses for DREADD occupancy are 20-fold and 60-fold lower than CNO or DREADD agonist 21 (C21) respectively.

#### **Uses and applications**

Systemic delivery of low doses of DCZ (1 or  $3 \mu g/kg$ ) were shown to enhance neuronal activity via hM3Dq in mice and monkeys within minutes.

Intramuscular doses of 100 µg/kg reversibly induced spatial working memory deficits in hM4Di

Deschloroclozapine dihydrochloride (water soluble) also available.

## **Solubility & Handling**

Solubility overview Solub

Soluble in DMSO (100 mM), and in ethanol (50 mM with warming)  $\,$ 

Storage instructionsRoom temperatureStorage of solutionsPrepare and use so

Prepare and use solutions on the same day if possible. Store solutions at -20 °C for up to one month if

storage is required. Equilibrate to RT and ensure the solution is precipitate free before use.

Shipping Conditions Stable for ambient temperature shipping. Follow storage instructions on receipt.

Important This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not

for human or veterinary use

### **Chemical Data**

Chemical name Molecular Weight Chemical structure 6-(4-methylpiperazin-1-yl)-11H-benzo[b][1,4]benzodiazepine

292.38

SMILES CN1CCN(CC1)C2=NC3=CC=CC3NC4=CC=CC42

**Source** Synthetic

InChi InChi=1S/C18H20N4/c1-21-10-12-22(13-11-21)18-14-6-2-3-7-15(14)19-16-8-4-5-9-17(16)20-18/h2-

9,19H,10-13H2,1H3

InChiKey VQHITFFJBFOMBG-UHFFFAOYSA-N

Appearance Yellow solid

## References

Deschloroclozapine, a potent and selective chemogenetic actuator enables rapid neuronal and behavioral modulations in mice and monkeys

Nagai et al (2020) Nature Neuroscience 1157-1167 **PubMedID** 32632286

Chemogenetic actuator drugs impair prefrontal cortex-dependent working memory in rhesus monkeys

Upright and Baxter (2019) bioRxiv https://doi.org/10.1101/864140

Binding of 5H-dibenzo[b,e][1,4]diazepine and chiral 5H-dibenzo[a,d]cycloheptene analogues of clozapine to dopamine and serotonin receptors.

Phillips et al (1994) J Med Chem 37(17) **PubMedID**8064797