Deschloroclozapine (DCZ)

**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**

**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 ($EC_{50}$ 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$_2A$ and 5-HT$_2C$ 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 µg/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
expressing monkeys.

Deschloroclozapine dihydrochloride (water soluble) also available.

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**Solubility & Handling**

**Storage instructions**
Room temperature

**Solubility overview**
Soluble in DMSO (100 mM), and in ethanol (50 mM with warming)

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

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**Chemical Data**

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

**Molecular Weight**
292.38

**Chemical structure**
![Chemical Structure](image)

**Molecular Formula**
C\textsubscript{18}H\textsubscript{20}N\textsubscript{4}

**CAS Number**
1977-07-7

**PubChem identifier**
16103

**SMILES**
CN1CCN(C1)C2=NC3=CC=CC=C3NC4=CC=CC=C42

**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

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**References**

**Deschloroclozapine, a potent and selective chemogenetic actuator enables rapid neuronal and behavioral modulations in mice and monkeys**
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.**
PubMedID 8064797