

PRODUCT DATASHEET

Ready-to-Assay™ MrgD Mas-Related Gene Receptor Frozen Cells

CATALOG NUMBER: HTS206RTA

LOT NUMBER: 206090116

CONTENTS: Pack contains 2 vials of mycoplasma-free cells, 1 ml per vial. Fifty (50) mL of Media Component.

STORAGE: Vials are to be stored in liquid N₂. Media Component at 4°C (-20°C for prolonged storage).

BACKGROUND

Ready-to-Assay GPCR frozen cells are designed for simple, rapid calcium assays with no requirement for intensive cell culturing. Eurofins Discovery Services has optimized the freezing conditions to provide cells with high viability and functionality post-thaw. The user simply thaws the cells and resuspends them in media, dispenses cell suspension into assay plates and, following over night recovery, assays for calcium response.

The Mas-related genes (Mrgs), also known as sensory neuron-specific G-protein coupled receptors (SNSRs), are selectively expressed in subpopulations of sensory neurons involved in the perception of pain (Dong *et al.*, 2001). The Mrg family in rodents consists of 50 receptors in the MrgA-MrgH subfamilies, but humans contain fewer Mrg members. MrgD (also known as MrgD and TGR7) is found across species from rodents to humans, and its expression is restricted to nonpeptidergic, small-diameter, IB4+ dorsal root ganglion (DRG) neurons. MrgD binds β -alanine, but not L-alanine, which results in increased intracellular calcium and the suppression of forskolin-induced cAMP production, thus suggesting coupling to Gq and Gi proteins (Shinohara *et al.*, 2004). β -alanine-induced activation of MrgD inhibits KCNQ2/3-mediated M-currents in cells overexpressing MrgD and KCNQ2/3 and also in cultured DRG neurons, which indicates that MrgD enhances nociceptive signaling (Crozier *et al.*, 2007). Cloned human MrgD-expressing cell line is made in the Chem-1 host, which supports high levels of recombinant MrgD expression on the cell surface for functional detection via the calcium signaling pathway. Thus, the cell line is an ideal tool for screening for agonists, antagonists, and modulators at MrgD.

USE RESTRICTIONS

Please see User Agreement (Label License) for further details. **One such restriction is that the contents of the supplied vial(s) are limited to a single use and shall not be propagated and/or re-frozen by licensee.**

WARNINGS

For Research Use Only; Not for Use in Diagnostic Procedures
Not for Animal or Human Consumption

GMO

This product contains genetically modified organisms.
Este producto contiene organismos genéticamente modificados.
Questo prodotto contiene degli organismi geneticamente modificati.
Dieses Produkt enthält genetisch modifizierte Organismen.
Ce produit contient organismes génétiquement des modifiés.
Dit product bevat genetisch gewijzigde organismen.
Tämä tuote sisältää geneettisesti muutettuja organismeja.
Denna produkt innehåller genetiskt ändrade organismer.

APPLICATIONS

Calcium Flux Assays, Agonist Mode Only¹

APPLICATION DATA

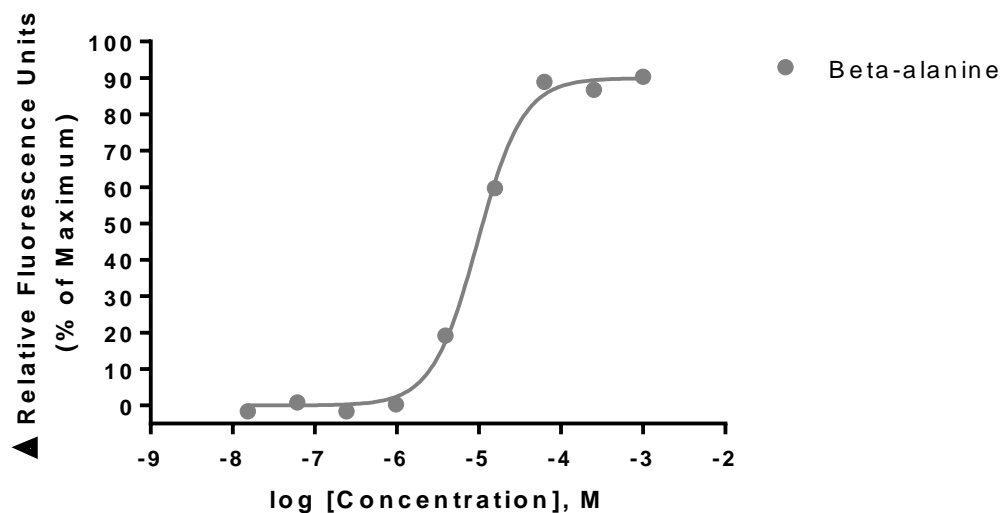


Figure 1. Representative data for activation of MrgD receptor. Calcium flux in MrgD-expressing Chem-1 cell line induced by β -Alanine. MrgD-expressing Chem-1 cells were loaded with a calcium dye, and calcium flux in response to the indicated ligand(s), 4-fold serial dilution with each concentration performed in duplicate, was determined on a Molecular Devices FLIPR^{TETRA}. Maximal fluorescence signal obtained in this experiment was 3,500 RLU (Relative Light Units).

Table 1. EC₅₀ value of MRGPRD-expressing Chem-1 cells.

LIGAND	ASSAY	POTENCY (nM)	REFERENCE
β -Alanine	Calcium Flux	9.6	Eurofins Internal Data

ASSAY SETUP

1. Immediately upon receipt, thaw cells or place cells in liquid nitrogen.
2. Thaw cells rapidly by removing from liquid nitrogen and immediately immersing in a 37°C water bath. Immediately after ice has thawed, sterilize the exterior of the vial with 70% ethanol.
3. Add 1mL of pre-warmed Media Component to each vial of cells. Place contents from two vials into a 15 mL conical tube and bring the volume to 10 mL of Media Component.
4. Centrifuge the cell suspension at 190 x g for four minutes
5. Remove supernatant and add 10.5 mL of pre-warmed Media Component to resuspend the cell pellet.
6. Seed cell suspension into appropriate assay microplate (100 μ L/well for 96-well plate, 25 μ L/well for 384-well plate).
7. When seeding is complete, place the assay plate at room temperature for 30 minutes.

¹ Eurofins' MrgD RTA cell line has been validated for use in Agonist mode only. Antagonist data may be generated by the client; however, it will not be supported with Eurofins' historic data.

8. Move assay plate to a humidified 37°C 5% CO₂ incubator for 24 hours.
9. After 24 hour incubation, remove assay plate from the incubator and wash sufficiently with Hank's Balanced Salt Solution (HBSS) supplemented with 20mM HEPES, 2.5mM Probenecid at pH 7.4 to remove all trace of Media Component.
10. Prepare Fluo-8, AM (AAT Bioquest: 21080) Ca²⁺ dye by dissolving 1mg of Fluo-8 NW in 200 µL of DMSO. Once dissolved place 10 µL of Fluo-8 NW Ca²⁺ dye solution into 10 mL of HBSS 20mM HEPES, 2.5mM Probenecid pH 7.4 buffer and apply to assay microplate (Ca²⁺ dye at 10 µL /10 mL is sufficient for loading one (1) microplate).
11. Set-up FLIPR to dispense 3x ligand to appropriate wells in the assay plate. Set excitation wavelength at 470-495 nm (FLIPR^{TETRA}) or 485 nm (FLIPR1, FLIPR2, FLIPR3) and emission wavelength at 515-565 nm (FLIPR^{TETRA}) or emission filter for Ca²⁺ dyes (FLIPR1, FLIPR2, FLIPR3). Set pipet tip height to 5 µL below liquid level and dispense rate to 75 µL/sec (96-well format) or 50 µL/sec (384-well format). Set up plate layout and tip layout for each individual experiment. Set time course for 180 seconds, with ligand addition at 10 seconds.
12. Ligands are prepared in non-binding surface Corning plates (Corning 3605 – 96-well or Corning 3574 – 384-well).
13. After the run is complete, negative control correction is applied and data analyzed utilizing the maximum statistic.

ASSAY MATERIALS

Description	Supplier and Product Number
HBSS	Hyclone: SH30268.02
HEPES 1M Stock	EMD Millipore.: TMS-003-C
Probenecid	Sigma: P8761
Quest Fluo-8 ^{IM} , AM	AAT Bioquest: 21080
β-Alanine ligand	Sigma: A9920
Non-binding white plates (for ligand prep)	Corning: 3605(96-well)/3574(384-well)
Black (clear bottom) tissue-culture treated plates	Corning: 3904(96-well)/3712(384-well)

FLIPR SETTINGS

Settings for FLIPR^{TETRA}® with ICCD camera option

Option	Setting
Read Mode	Fluorescence
Ex/Em	Ex470_495 / Em515_575
Camera Gain	2000
Gate Open	6 %
Exposure Time	0.53
Read Interval	1s
Dispense Volume	50 µl (25 µl for 384-well)
Dispense Height	25 µl (50 µl for 384-well)
Dispense Speed	75 µl L/sec (50 µl for 384-well)
Expel Volume	0 µl
Analysis	Subtract Bias Sample 1

HOST CELL

Chem-1, an adherent rat hematopoietic cell line expressing endogenous Gα15 protein.

EXONGENOUS GENE EXPRESSION

MrgD cDNA (Accession Number: NM_198923; AY427820; see CODING SEQUENCE below) expressed from a proprietary pHS plasmid.

CODING SEQUENCE

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atgaaccagactttgaatagcagtgaggaccgtggagtcagccctaaactattccagaggg
M N Q T L N S S G T V E S A L N Y S R G
agcacagtgcacacggcctacctggtgctgagctccctggccatgttcacctgacctgtgc
S T V H T A Y L V L S S L A M F T C L C
gggatggcaggcaacagcatggtgatctggctgctgggctttcgaatgcacaggaacccc
G M A G N S M V I W L L G F R M H R N P
ttctgcatctatctcctcaacctggcggcagccgacctcctctctctcagcatggct
F C I Y I L N L A A A D L L F L F S M A
tccacgctcagcctggaaccagccctggtcaataccactgacaaggctccacgagctg
S T L S L E T Q P L V N T T D K V H E L
atgaagagactgatgtactttgctacacagtgaggcctgagcctgctgacggccatcagc
M K R L M Y F A Y T V G L S L L T A I S
accacgctgtctctctgtcctctctccctatctggttcaagtgctaccggcccagggcac
T Q R C L S V L F P I W F K C H R P R H
ctgtcagctcgggtgtgtagcctgctgtggacgctctgtctcctgatgaacgggttgacc
L S V W V C S L L W T L C L L M N G L T
tcttctctctgcagcaagttcttgaattcaatgaagatcggtgcttcaggggtggacatg
S S F C S K F L K F N E D R C F R V D M
gtccagggccgacctcatcatgggggtcttaacccagtgatgactctgtccagcctgacc
V Q A A L I M G V L T P V M T L S S L T
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W F V L Y W L S L P P E M Q V L C F S L
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S R L S S S V S S S A N P V I Y F L V G
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R E E P E L E G G E T P T V G T N E M G
gcttga
A stp

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RELATED PRODUCTS

PRODUCT NUMBER

HTSCHEM-1RTA

HTS206M

DESCRIPTION

Ready-to-Assay™ Chem-1 host frozen cells (control cells)

ChemiScreen™ MrgD Mas-Related Gene receptor membrane prep

REFERENCES

1. Crozier RA *et al.* (2007) MrgD Activation Inhibits KCNQ/M-Currents and Contributes to Enhanced Neuronal Excitability. *J. Neurosci.* 27(16): 4492-4496.
2. Dong X *et al.* (2001) A diverse family of GPCRs expressed in specific subsets of nociceptive sensory neurons. *Cell* 106: 619-632.
3. Shinohara T *et al.* (2004) Identification of a G protein-coupled receptor specifically responsive to β -alanine. *J. Biol. Chem.* 279: 23559-23564.

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