Signaling Through a Mu-Opioid – Cannabinoid CB1 Receptor Heteromer, a Novel Analgesic Target

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Opportunity

Gi signaling through homomeric mu-opioid and cannabinoid CB1 receptors

![Graph](image1)

Fig 1. Opioid – cannabinoid interaction. A. The antinociceptive effects of morphine are enhanced by d9THC. d9THC at an inactive dose of 20mg/kg was administered p.o. 15 min before morphine p.o. (Cichewicz D et al. The Journal of Pharmacology and Experimental Therapeutics 1999: 289, 859-867) B. The light intensities were expressed as a BRET ratio. ***P<0.001 (Rios C et al. British Journal of Pharmacology 2006: 148, 387-395)

Approach

Calcium mobilization assay

![Graph](image2)

Fig 2. Calcium mobilization assay. A. Human Embryonic Kidney 293 (HEK293) cells. B. GCaMP was utilized as an indicator of intracellular calcium level. (Chen TW et al. Nature 2013; 499: 295-300) C. Fluorescence was read by FlexStation which is equipped with robotic liquid handler that allows high throughput assays.

Results

Gi signaling through heteromeric mu-opioid and cannabinoid CB1 receptors

![Graph](image3)

Fig 3. HEK 293 cells were transiently transfected with 50ng GPCRs and 50ng G proteins with lipofectamine2000. Intracellular calcium levels were detected by a FlexStation, 48 hours after transfection.

Impact

- Our work characterization of the MOR-CB1 receptor heteromer complex helps the development of novel therapeutics for pain treatment.

The unique feature about my innovation/research is: Targeting at a heteromeric MOR-CB1 receptor complex

This addresses the problem of: Opioid crisis and side effects of current analgesics

References


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