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Meeting abstract

GPR55: signaling pathways and functions

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Background

We have recently shown that the G protein-coupled receptor 55 (GPR55) mediates intracellular effects of cannabinoids and other, non-cannabinoid ligands in addition to the classical cannabinoid 1 (CB_1) and 2 (CB_2) receptors. Here we show different signaling pathways triggered by GPR55 in response to a panel of its agonists. In addition the cytoskeleton rearrangement mediated by GPR55 is investigated.

Methods

HEK-293 cells stably expressing the GPR55 receptor were characterized in terms of signaling properties. To this end, FLEX calcium release, reporter gene, dynamic mass redistribution (DMR) and phalloidin actin staining assays have been performed.

Results

Here we show that GPR55 is activated by lysophosphatidylinositol (LPI), AM251, SR141716A (rimonabant) and AM281. GPR55 activation induces intracellular calcium release, NF-κB, NFAT and CREB activation. Stimulation of GPR55 induces F-actin formation under the control of Gα13, RhoA and ROCK. We also show the suitability of Corning® Epic® DMR assay for GPR55 ligand screening.

Conclusion

GPR55 as the novel cannabinoid receptor triggers distinct signaling pathways in response to LPI and some classical CB_1 receptor antagonists. Stress fiber formation mediated by GPR55 might show the function of this receptor *in vivo*.