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Glycine effect on the expression profile of orphan receptors GPR21, GPR26, GPR39, GPR82 and GPR6 in a model of inflammation in 3T3-L1 cells

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Chronic or low-grade inflammation is a process where various immune cells are recruited from the periphery into adipose tissue. This event gives rise to localized inflammation, in addition to having a close interaction with cardio metabolic pathologies where the mediation of orphan receptors is observed. Adipose tissue hypertrophy is associated with immune cell infiltration (macrophages and T cells) and a local pro-inflammatory state with the participation of cytokines such as TNF-α,IL-6 and IL-1β, inducing insulin resistance, thereby deregulating glucose and lipid metabolism in adipose tissue, skeletal muscle and the liver. Glycine is a non-essential amino acid found at high levels in plasma, but a decrease in these levels has been associated with low-grade inflammation in diseases such as obesity, type 2 diabetes mellitus and cardiovascular diseases. In this study, we explored the gene expression of GPR21, GPR26, GPR39, GPR82 and GPR6 in this cell-type. Moreover, the effects of TNF-α and glycine on the modulation of these orphan receptors in 3T3-L1 cells were investigated, suggesting participation in the low-grade inflammatory process. The 3T3-L1 cells were stimulated with TNF-α (5 ng/mL) for 60 min as an inflammatory model. Gene expression was measured by RT-qPCR. We observed that the inflammatory stimulus of TNF-α in adipocytes decreased the expression of the orphan receptors GPR21, GPR26, GPR39, GPR82 and GPR6, which are related to low-grade inflammation. Our results suggest that GPR21 and GPR82 are modulated by glycine, it shows a possible protective role in the presence of an inflammatory environment in adipocytes, and they could be a therapeutic target to decrease the inflammation in some diseases related to low-grade inflammation such as diabetes, obesity and metabolic syndrome.

Biography

Karla Aidee Aguayo Ceron has her expertise in cell culture of different cell lines and cells from organism (primary cell cultures). Her evaluation model based on molecular technics to determinate genic and protein expression in cells and tissues creates new pathways for improving the therapeutic options in metabolic syndrome and diseases related to inflammation. She has experience in research, evaluation and teaching. She belong to the Researcher National System in Mexico