



Indian Journal of Experimental Biology
Vol. 63, March 2025, pp. 192-199
DOI: 10.56042/ijeb.v63i03.11585

Online Version of Science Communication and Public Relations
NISUPR
सीएसआईआर-निसुपर

Ghrelin treatment alleviates appetite-related receptor expressions and oxidative stress in fructose-streptozotocin-induced diabetic rat duodenum

Zeynep Mine COSKUN YAZICI^{1*}, Alisa Bahar BEYDOGAN², Bilge Nur BILGE² & Sema BOLKENT²

¹Department of Molecular Biology and Genetics, Faculty of Arts and Sciences, Demiroglu Bilim University, Istanbul, Türkiye

²Department of Medical Biology, Cerrahpaşa Faculty of Medicine, Istanbul University-Cerrahpaşa, Istanbul, Türkiye

Received 03 June 2024; revised 23 January 2025

Ghrelin (GHR), a peptide that regulates appetite and energy balance, is important for type 2 diabetes (T2D). Glucagon-like peptide-1 receptor (GLP-1R) and cannabinoid receptor 1 (CB-1R) are two receptors associated with energy and food metabolism. Understanding the effects of GHR on GLP-1R and CB-1R may help develop treatments for weight regulation in T2D. We investigated the effects of GHR supplementation on both appetite-related receptor expression and oxidative stress in the duodenum of a rat model of diabetes. Rats (n=21) were divided into control (CO), T2D, and T2D+GHR groups. The number and intensity of GLP-1R and CB-1R immunopositive cells were detected by immunohistochemistry. Expression levels of GLP-1R and CB-1R mRNAs were analyzed by qPCR in the duodenum. Oxidative stress parameters were measured in duodenal tissues. During the third and fourth weeks of the experiment, body weight in the T2D+GHR group was significantly reduced compared to the T2D group. The number and intensity of CB-1R and GLP-1R immunopositive cells were significantly lower in the T2D+GHR group than in the T2D group. The results of GLP-1R and CB-1R mRNA expression paralleled the immunohistochemical staining. According to our findings, GHR supplementation may contribute to healing in the duodenum of a diabetic rat model by suppressing appetite-related receptors.

Keywords: Cannabinoid receptor 1, Gastric peptide, Immunohistochemistry, Biochemistry, Type 2 diabetes