

CBD-Rich Cannabis Extract Regulates Neurotrophic and Inflammatory Gene Expression in Equine Mesenchymal Stem Cells: Implications for Peripheral Nerve Repair

Beatriz da Costa Kamura¹, Lucas Vinícius de Oliveira Ferreira¹, Pedro Henrique Domingues de Oliveira^{1,2}, Natielly Dias Chimenes¹, João Pedro Marmol de Oliveira¹, Diego Noé Rodríguez Sánchez³, Márcio de Carvalho¹, Rogério Martins Amorim^{1,2}

¹Department of Veterinary Clinic, São Paulo State University (UNESP), School of Veterinary Medicine and Animal Science, Botucatu, São Paulo, Brazil.

²NEICANN - Cannabis Interdisciplinary Research Center.

³Institute of Biology, University of Campinas (UNICAMP), Campinas, São Paulo, Brazil.

Email: rogerio.amorim@unesp.br

Introduction: Peripheral nerve injuries are common in both equines and humans, potentially compromising quality of life. The treatment of these injuries requires therapeutic approaches that promote a microenvironment conducive to regeneration. The anti-inflammatory and neuroprotective potential of mesenchymal stem cells (MSCs) and cannabidiol (CBD), when combined, may represent a promising target for the treatment of peripheral neuropathies. **Objective:** Thus, the aim of this study was to evaluate the ability of a *cannabis* extract rich in CBD to induce adipose-derived equine mesenchymal stem cells (EqAT-MSCs) to express genes related to their neurotrophic and anti-inflammatory potential in an *in vitro* inflammatory model. **Methods:** The gene expression of brain-derived neurotrophic factor (BDNF), glial-derived neurotrophic factor (GDNF), nerve growth factor (NGF), and interleukins IL-1 β , IL-6, IL-10, interferon-gamma (IFN- γ), and tumor necrosis factor-alpha (TNF- α) was analyzed in EqAT-MSCs under the following experimental conditions: DMEM medium (control), DMEM + lipopolysaccharide (LPS) (10 ng/ml), and LPS (10 ng/ml) + DMEM + CBD at concentrations of 3 μ M, 5 μ M, and 7 μ M, stimulated for 48 hours. **Results:** The comparison between the CBD-treated group and the DMEM + LPS group revealed a significant increase in BDNF expression (3 and 5 μ M). A decrease in NGF expression (3, 5, and 7 μ M) was also observed, along with a reduction in IL-6 expression (3, 5, and 7 μ M). No significant differences were found in the expression of GDNF, IL-1 β , IL-

10, TNF- α , and IFN- γ . **Conclusions:** The results indicate that a CBD-rich cannabis extract can upregulate or downregulate the gene expression of neurotrophic factors and interleukins in EqAT-MSCs within an *in vitro* inflammatory environment, suggesting its immunomodulatory potential. This makes it a promising approach for treating peripheral nerve injuries in horses.

Keywords: Horse. Interleukins. Neurotrophic factors.

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