

Moringin Treatment on Mesenchymal Stem Cells from Periodontal Ligament Induces Neural Differentiation

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Neurodegenerative disorders are a broad-ranging and highly complex group, with diverse etiologies and frequently overlapping clinical manifestations and marked by the loss of neurons within the brain and/or spinal cord [1]. The therapeutic strategies for neurodegenerative diseases still represent a vast research field because of the lack of targeted, effective and resolutive treatment for neurodegenerative diseases [2]. The use of stem cell-based therapy is an alternative approach that could lead to the replacement of damaged neuronal tissue[3]. For this purpose, adult mesenchymal stem cells (MSC), including periodontal ligament stem cells (hPDLSCs), could be very useful for their differentiation capacity, easy isolation and the ability to perform an autologous implant [4]. The aim of this work was to test whether the Moringin [4- (α -L-rhamnosyloxy) benzyl isothiocyanate; GMG-ITC], an isothiocyanate extracted from *Moringa oleifera* seeds, was able to produce an effect on hPDLSCs in terms of neural differentiation profile expression. Recently moringin effects have attracted the attention of scientists for its chemopreventive activity. Moringin treatment showed an increased expression of genes involved in neuron cortical development by means next-generation transcriptomics sequencing analysis, in particular the profile is near to neuron belonging to upper and deep cortical layers. Moreover, genes involved in osteogenesis and adipogenesis were modulated with moringin treatment although with a lower fold change compared to upregulated genes involved in neuronal differentiation. Moringin did not induce the expression of oncogenes and it can be considered a safe treatment. A better understanding of the mechanisms underlying neurodegeneration should lead to more effective, disease-modifying treatments in the future.

References

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Key words

Oral stem cells, moringin, neurodegenerative disease, neurogenic differentiation.