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**Research Communication**

## Neuroimmunomodulatory properties of DPSCs in an *in vitro* model of Parkinson's disease

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## Abstract

In neurodegenerative diseases, such as Alzheimer's and Parkinson's, microglial cell activation is thought to contribute to their degeneration by producing neurotoxic compounds. While dental pulp stem cells (DPSCs) have been regarded as the next possible cell source for cell replacement therapy (CRT), their actual role when exposed in such harsh environment remains elusive. In this study, the immunomodulatory behavior of DPSCs from human subjects was investigated in a coculture system consisting of neuron and microglia which were treated with 1-methyl-4-phenyl-1, 2, 3, 6-tetrahydropyridine, which mimics the inflammatory conditions and contribute to degeneration of dopaminergic (DA-ergic) neurons. Assessments were performed on their proliferation, extent of DNA damage, productions of reactive oxygen species (ROS) and nitric oxide (NO), as well as secretion of inflammatory mediators. Notably, DPSCs were shown to attenuate their proliferation, production of ROS, and NO significantly ( $P < 0.05$ ). Additionally, their immunomodulatory properties were distinct although insignificant changes were observed in DNA damage. Despite DPSCs were exposed to such harsh environment, they were still able to express neuronal markers such as Nestin, Pax 6, and Nurr1, at least by twofold thereby indicating their applicability for CRT especially in PD conditions. To conclude, DPSCs

were shown to have immunomodulatory capacities which could probably serve as secondary effects upon transplantation in a CRT regime. © 2017 IUBMB Life, 69(9):689–699, 2017

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