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Effect of f68 on cryopreservation of mesenchymal stem cells derived from human tooth germ

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Abstract

The use of stem-cell-based therapies in regenerative medicine and in the treatment of disorders such as Parkinson, Alzheimer's disease, diabetes, spinal cord injuries, and cancer has been shown to be promising. Among all stem cells, mesenchymal stem cells (MSCs) were reported to have anti-apoptotic, immunomodulatory, and angiogenic effects which are attributed to the restorative capacity of these cells. Human tooth germ stem cells (HTGSCs) having mesenchymal stem cell characteristics have been proven to exert high proliferation and differentiation capacity. Unlike bone-marrow-derived MSCs, HTGSCs can be easily isolated, expanded, and cryopreserved, which makes them an alternative stem cell source. Regardless of their sources, the stem cells are exposed to physical and chemical stresses during cryopreservation, hindering their therapeutic capacity. Amelioration of the side effects of cryopreservation on MSCs seems to be a priority in order to maximize the therapeutic efficacy of these cells. In this study, we tested the effect of Pluronic 188 (F68) on HTGSCs during long-term cryopreservation and repeated freezing and defrosting cycles. Our data revealed that F68 has a protective role on survival and differentiation of HTGSCs in long-term cryopreservation. © 2013 Springer Science+Business Media New York.

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Keywords

Cryopreservation, Human tooth germ stem cell, Pluronic