

Effect of Mechanical Tension on the Human Dental Pulp Cells

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In this study, we evaluate the effects of mechanical tension on the proliferation and extracellular matrix production of human dental pulp stem cells (DPSCs) using a flexwell system that imposed cyclic mechanical tension at 0.03 Hz with 0, 5, and 8 % strains. In the early stage (4 days), DPSCs at 5 and 8 % strains similar proliferation, which was higher than control in the late stage (10 days), DPSCs at 8 % strain higher proliferation than control and 5 % strains. This result that DPSC proliferation under tension varied with culture time. mechanical tension increase the of lactate dehydrogenase during culture. RT-PCR mechanical tension increased collagen and osteopontin expression and decreased α -smooth muscle actin expression. FACS analysis showed that CD105 expression did not change in all groups but CD 90 expression decreased at 8 % strain. In conclusion, that appropriate level of mechanical tension serve as a potent positive modulator of proliferation, differentiation and ECM production DPSCs.