Effect of Mechanical Stimulation on the Differentiation of Cord Stem Cells

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To support and enhance the in vitro differentiation and activity of cord stem cells(CSCs), the cell culture medium maybe supplemented with various proteins and factors in order to mimic the physiological environment in which cells optimally proliferate and differentiate. In this study, we evaluate the effects of mechanical tension on the differentiation and extracellular matrix (ECM) production of CSCs using a flexwell system that imposed cyclic mechanical tension at 0.03 Hz with 0, 5, and 10 % strains. Mechanical stretch did not increase the release of lactate dehydrogenase (LDH) from CSCs during culture and increased GAG and elastin synthesis. And mechanical tension increased osteocalcin, osteopontin, and vimentin expression by RT-PCR analysis. It is thought that the appropriate level of mechanical stretch served as a potent positive modulator of CSC differentioation.