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EFFECTS OF SPACEFLIGHT ON EGFP-MG63 CELLS ONBOARD SHENZHOU-7

Abstract

Long-term unloading conditions during space mission continuously decreased the bone health of astronauts, which has been proved to be related closely with osteoblasts activity and function of preosteoblast's differentiation. We constructed and screened a MG63 cell line stably transfected with OSE promoter and report gene (EGFP) during ground research, and space experiment by this cell line was carried out onboard Shenzhou-7 from 25th Sep to 28th Sep, 2008. Analysis from the recovery samples have shown that results from space experiment were partly similar to that from ground research by clinostat. After 48 hours of spaceflight, degradation and disorganization of microfilaments appeared in MG63 cells, concurrently, the expression of EGFP decreased, which revealed that the OSE promoter was downregulated under microgravity. We also found that, by treated with Jasplakinolode (J7473), a kind of reagent which can induce the actin polymerization, the changes mentioned above of MG63 cells were inhibited to a certain extent. Our next explore will still focus on the molecule pathway of osteoblasts response to microgravity and its mechanism of gene regulation, in order to find out the potential molecular targets for developing new approaches to protect bone system, for further manned space exploration.