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## A NOVEL APPROACH TO MITIGATE MICROGRAVITY INDUCED BONE LOSS IN ASTRONAUTS

**Abstract**

Microgravity-induced bone loss is currently a significant and unresolved health risk for space travel. Exposure of astronauts to microgravity leads to the loss of calcium from weightbearing bones. Prolonged exposure, for example- During a journey to Mars, may present problems on return to Earth, with increased risk of fractures and premature osteoporosis in later life. In microgravity the production of osteoclasts (cells that degrade bone to initiate normal bone re-modelling) is more when compared to osteoblasts (involved in the formation and mineralization of bones). Under Earth's gravity, the production rate of both these elements (osteoclasts and osteoblasts) are equal. Also long-duration space travel can have detrimental effects on human physiology such as psychological problems, cephalic fluid shifts, neuro-vestibular problems, and cognitive alterations. Hence through this paper I would like to present a novel approach of inducing an artificial gravity environment using centripetal acceleration within the space shuttle. The entire design, parameters for maintaining astronauts physical and cognitive health will also be addressed herewith. This idea will help resolve some major health hazards for the astronauts and also achieve long duration space travel which are surely coming up in the near future.