SYMPOSIUM ON VISIONS AND STRATEGIES FOR FAR FUTURES (D4)
Space Elevators and Tethers (4)

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# COMFORTABLENESS IN SPACE ELEVATOR — PHYSIOLOGICAL CHALLENGE

**Abstract**

In riding on space elevator, several physiological changes occur caused by acute gravitational change. Especially, gravitational changes toward head (Gz) and foot (+Gz) provides significant physiological challenge. We have investigated sudden gravitational change using parabolic flight, and observed how our autonomic nervous system alters to maintain our blood pressure against fluid shift. Stabilization of autonomic nervous system was investigated by using head-out water immersion study, and stabilization of circulatory blood volume was studied by using head-down bedrest. Sudden gravitational change was buffered in a few seconds by autonomic alteration, and stabilization of autonomic nervous system was obtained in 20-30 min by endocrinological change. Circulatory plasma volume was adjusted in 5-7 days by shifting the body fluid from intravascular space to interstitial space and finally to intracellular space. Urine volume was also increased after bedrest to adjust the circulatory plasma volume. These alterations induce spaceflight deconditioning, and it will be the case of space elevator. Countermeasure to adjust these changes should be taken into account for the crewmembers of space elevator.