

Poster Session (P)  
Poster Lunch (1)

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## THE INTESTINAL MICROBIOTA CONTRIBUTES TO COLONIC EPITHELIAL CHANGES IN SIMULATED MICROGRAVITY MOUSE MODEL

### Abstract

Exposure to microgravity leads to alterations in multiple systems. But microgravity-related changes in the gastrointestinal tract and its clinical significance have not been well studied. We used hindlimb unloading (HU) mouse model to simulate microgravity condition and investigated the changes of intestinal microbiota and colonic epithelial cells. Compared to ground controls, HU affected fecal microbiota composition with a profile characterized by the expansion of Firmicutes and decrease of Bacteroidetes. The colon epithelium of HU mice showed decreased goblet cells numbers, reduced epithelial cell turnover, and decreased expression of genes involved in defense and inflammatory responses. As a result, increased susceptibility to DSS-induced epithelial injury was observed in HU mice. Co-housing of control mice with HU mice resulted in HU-like epithelial changes in control mice. Transplantation of feces from control to HU mice alleviated the epithelial changes in HU mice. The results indicate that HU changes intestinal microbiota, leading to altered colonic epithelial cell homeostasis, impaired barrier function, and increased susceptibility to colitis. These animal results emphasize the necessity for evaluating astronauts' intestinal homeostasis in distant space travels.