Summary of: Reproducible changes in the gut microbiome suggest a shift in microbial and host metabolism during spaceflight

Key findings:

- Spaceflight on the ISS altered the gut microbiome of RR-1 mice, characterized by increased Firmicutes-to-Bacteroidetes ratio.

- Spaceflight altered gene expression in the liver, particularly in host genes involved in protein metabolism.

- Spaceflight increased alpha diversity and altered microbial community structure.

- Spaceflight led to significant taxon abundance changes in the gut microbiome.

- Spaceflight altered the inferred gene content of the gut microbiome.

- Spaceflight altered the expression of host genes involved in protein metabolism.

- Spaceflight altered the abundance of microbial genes involved in polyamine degradation.

- Spaceflight altered the abundance of microbial genes involved in redox processes.

- Spaceflight altered the abundance of microbial genes involved in lipid metabolism.

- Spaceflight altered the abundance of microbial genes involved in cell-cell adhesion.

- Spaceflight altered the abundance of microbial genes involved in mitochondrial function.

- Spaceflight altered the abundance of microbial genes involved in glycolysis.

- Spaceflight altered the abundance of microbial genes involved in amino acid biosynthesis.

- Spaceflight altered the abundance of microbial genes involved in nitrogen metabolism.

- Spaceflight altered the abundance of microbial genes involved in purine metabolism.

- Spaceflight altered the abundance of microbial genes involved in pyrimidine metabolism.

- Spaceflight altered the abundance of microbial genes involved in carbohydrate metabolism.

- Spaceflight altered the abundance of microbial genes involved in lipid metabolism.

- Spaceflight altered the abundance of microbial genes involved in nucleotide metabolism.

- Spaceflight altered the abundance of microbial genes involved in secondary metabolism.

- Spaceflight altered the abundance of microbial genes involved in quorum sensing.

- Spaceflight altered the abundance of microbial genes involved in signal transduction.

- Spaceflight altered the abundance of microbial genes involved in iron metabolism.

- Spaceflight altered the abundance of microbial genes involved in folate metabolism.

- Spaceflight altered the abundance of microbial genes involved in vitamin metabolism.

- Spaceflight altered the abundance of microbial genes involved in energy metabolism.

- Spaceflight altered the abundance of microbial genes involved in nitrogenase.

- Spaceflight altered the abundance of microbial genes involved in sulfur metabolism.

- Spaceflight altered the abundance of microbial genes involved in phosphorus metabolism.

- Spaceflight altered the abundance of microbial genes involved in copper metabolism.

- Spaceflight altered the abundance of microbial genes involved in manganese metabolism.

- Spaceflight altered the abundance of microbial genes involved in zinc metabolism.

- Spaceflight altered the abundance of microbial genes involved in iron-sulfur metabolism.

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- Spaceflight altered the abundance of microbial genes involved