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SPACE NEUROSCIENCE: CURRENT UNDERSTANDING AND FUTURE RESEARCH

Abstract

Space exploration is crucial for understanding our surroundings and establishing scientific concepts to explore, monitor, and save our planet's environment. However, the response of the human nervous system in the environment of space poses numerous challenges. Brain complexity explains the vulnerability and intrinsic difficulty of recalibration after disturbance. Over the millennia, the brain has evolved to function at 1-G. Studying the brain and its physiology in different environments may shed light on multiple conditions encountered on Earth that are yet to be solved and dictate collaboration at international levels. The nervous system is affected by several stressors due to microgravity, radiation, isolation, disruption of circadian rhythm, impaired sleep dynamics, and hypercapnia associated with space travel. In this article, we aim to review several aspects related to the nervous system in weightless conditions, as well as the development and future of the emerging field of "space neuroscience.". Space neuroscience is a fascinating, embryonic field that requires significant development. The establishment of frameworks for the strategic development of space neuroscience is vital, as more research and collaboration are required to overcome these numerous and diverse challenges, minimize risks, and optimize crew performance during planetary operations.