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BIOTECHNOLOGICAL STRATEGIES FOR SUSTAINED HUMAN PRESENCE ON MARS

Abstract

As humans move beyond our natal planet, how will we shape and adapt to new environments? How can we create regenerative life support systems to help us live off the land? How can we develop technologies that are relevant for both Earth and interplanetary exploration? Biotechnology offers unique solutions to essential aspects of life support that can promote a more sustainable economy on Earth. Join us for a practical and provocative discussion of the possibilities of encouraging human, plant, and microbial life off Earth as we begin to plan long-term, deep space exploration.

This paper proposes biotechnological strategies, including production of multi-modal materials using synthetic biology for in situ resource utilisation (ISRU), to support sustained human presence on Mars, including progressive evolution of the built space environment itself to suit long-term habitation that would be less dependent upon re-supply missions from Earth.