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POSSIBILITY TO EXPAND OPPORTUNITY WITH LARGE-SCALE CENTRIFUGE FACILITY FOR
THE INTERNATIONAL SPACE STATION AND BEYOND

Abstract

In the life science experiment of the International Space Station, the research of the effect of gravity on life is one of the important items, and it has been studied in Kibo since 2008. The Cell Biology Experiment Facility (CBEF) developed by our company under a contract with JAXA contains not only the microgravity area but also the centrifuge area in its incubator. The Centrifuge provides artificial gravity to experimental samples, enabling the samples to be compared with those in microgravity environment. An incubator equipped with a large-scale centrifuge has been available since 2020. The large centrifuge can increase the number of experimental samples and accommodates larger experimental samples. Further development and expansion of experimental contents are expected by utilizing the updated capability. This paper describes the development of an incubator equipped with a large centrifuge and the utilization ideas such as simulation experiments of lunar and Martian gravity using artificial gravity, commercial use using the communication function and environmental control function, STEM education use using 1U device, or ten-cubic-centimeter-sized experimental equipment, and the possibility of food production related to habitat technology.