

MICROGRAVITY SCIENCES AND PROCESSES (A2)
Microgravity Sciences onboard the International Space Station and Beyond (6)

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HIGH QUALITY PROTEIN CRYSTAL GROWTH EXPERIMENT ONBORD “KIBO”

Abstract

Our goal is to contribute to yielding results which meet the social requirements. Protein crystallization experiment in space environment has been performed for more than 20 years. Japan Aerospace Exploration Agency (JAXA) has conducted protein crystallization experiment in International Space Station (ISS) since 2003. In this project, totally about 300 protein samples were launched by Russian space transportation system and JAXA developed the technology to obtain the high quality crystals in space. JAXA also established user-friendly support service system for users to apply to the space experiment easily. Japanese experiment module “Kibo” (JEM) was assembled ISS in 2008 and now being used. JAXA started new protein crystallization experiment “High Quality Protein Crystal Growth Experiment (JAXA PCG)” in JEM from 2009. Six space experiments will be conducted in every six months. We have already conducted three experiments onboard Kibo until now (March 2011). The protein samples are transported by Russian Progress Spacecraft to the ISS in cooperation with Federal Space Agency (Russia) and are placed in the Protein Crystallization Research Facility (PCRF) in JEM for 2-4 months. The experimental opportunities are provided for commercial users who want to get the results exclusively, for Japanese national project targeting the biological protein molecules to clarify diseases and life phenomenon, for JAXA strategic mission to get results through the space experiment, for technical development to crystallize membrane protein and protein-ligand complex and for international cooperation for Russian user and Asian nations such as Malaysia. In this presentation the latest results (1st to 3rd experiment) are introduced. Some crystals obtained in space showed the high resolution data to contribute greatly to designing new drug or new functional catalyst.