

Development of Aquatic Habitat (AQH) for biomedical research in space using small fish

S. Uchida (1), Y. Kono (1) and M. Masukawa (2)

(1) Mitsubishi Heavy Industries, Ltd., Kobe, Japan, (2) Japan aerospace Exploration Agency (JAXA), Tsukuba, Japan (satoko_uchida@mhi.co.jp) / Fax: 81-78-672-2815 / Phone: 61-78-672-2814)

As well known, small freshwater fish, such as medaka or zebrafish, have many advantages for the experimental models, such as easiness to breed, rapid development, transparent embryo and larvae, short generation time, and many useful mutant strains. These small fish are considered as the excellent vertebrate models to achieve multi-generational breeding in the International Space Station (ISS) and to study the effects of space environment on vertebrate at the molecular level for the future long term manned space program.

Japan has a long history in space experiments with fish, and we have been developed several experiment facilities for Space Shuttle use. Based on these experiences, we are studying the next generational facility, Aquatic Habitat (AQH), for long term experiments in the ISS. The AQH will have the capabilities to accommodate three generations of small fish, medaka and zebrafish, that is, 90days life support function, automatic feeding according to developmental stages, separation of generations, specimen collection in various developmental stages, continuous behavior monitoring, and so on. Furthermore, we also studied a new design concept for small-type AQH that can be employed in various situations such as recoverable satellites, in the Cell Biology Experiment Facility (CBEF) in the Japanese Experiment Module (JEM), or in other places aboard the ISS.