PLANS OF PRELIMINARY EXAMINATION AND SUBSEQUENT ANALYSES OF CAPTURED DUST SAMPLES BY SILICA AEROGEL IN THE TANPOPO MISSION.

A. Yamagishi[1], H. Hashimoto[2], M. Higashide[2], E. Imai[3], H. Kawai[4], K. Kobayashi[5], H. Mita[6], K. Okudaira[7], S. Sasaki[8], M. Tabata[2], H. Yabuta[9], Y. Yaguchi[7], H. Yano[2], S. Yokobori[1], and Tanpopo WG. [1]Tokyo Univ. of Pharm. and Life Sci. E-mail: yamagish@ls.toyaku.ac.jp. [2]JAXA. [3]Nagaoka Univ. of Tech. [4]Chiba Univ. [5]Yokohama National Univ. [6]Fukuoka Instit. of Tech. [7]Univ. Aizu. [8]Tokyo Univ. of Tech. [9]Osaka Univ.

Introduction: The Tanpopo mission is a Japanese astrobiological experiment which will be conducted on the Japanese Experiment Module (JEM) of the International Space Station (ISS) [1]. The Tanpopo mission consists of several subthemes: 1) capture of microbes in space, 2) exposure of microbes in space, 3) exposure of organic compounds in space, 4) capture of organic compounds in micrometeoroids in space, 5) evaluation of ultra low-density aerogel developed for the Tanpopo mission, and 6) capture of space debris at the ISS orbit.

In this paper, subthemes (1), (4) and (6) will be introduced as one of coming sample return missions. Silica aerogel with 0.01 g cm^{-3} density supported by higher density aerogel [2] will be used to capture micrometeoroid and space debris at LEO. Captured particles and their penetration tracks will be offered for various analyses after retrieval to Earth. These samples will be analyzed for mineralogical, organic and microbiological characteristics.

Preliminary Examination Plan: Current status of Tanpopo-Aerogel-PET preparation will be introduced. In Preliminary Examination (PE), Curation Team covers the receipt of retrieved samples (Sample Aerogel Panels), sample catalog preparation for data archiving and sample storage. Whole Documentation Team deals with penetration track mapping/measurement (e.g. incoming angle, track depth and track volume). Processing Team prepares keystones or quickstones (small pieces of aerogel) containing particles and their penetration tracks for allocation to researchers. After preliminary characterization, the samples will be properly processed in accordance with a request by each sub-team for the subsequent detailed analyses.

Capture of Microbes in Space: Microbe Sub-Team will try to capture microbes at LEO to explore the possibility of their interplanetary migration [3]. Particles potentially containing microbes will be offered for PCR analysis.

Capture of Organic Compounds in Space: Organic Sub-Team will try to detect organic compounds in micrometeoroids in space to discuss whether IDPs containing prebiotic organic compounds migrate among solar system bodies [4].

Capture of Space Debris at the ISS Orbit: Space Debris Sub-Team will collect space debris at LEO.

We have almost established the procedure of analyses on the many analog samples obtained via laboratory (two-stage light gas gun) experiments. We will expand our facilities to improve each technique and working efficiency.

References: [1] Yamagishi A. et al. 2009. *Trans. JSASS Space Tech. Jpn.* 7: Tk 49-Tk 55. [2] Tabata M. et al. 2011. *Biol. Sci. Space*. 25: 7-12. [3] Yokobori S. et al. 2009. *Life Evol. Biosph*. 39: 377-378. [4] Kobayashi K. et al. 2009. *Orig. Life Evol. Biosph*. 39: 4.