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Tanpopo: Astrobiology Exposure and Micrometeoroid Capture Experiments

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There is a long history of the microbe-collection experiments at high altitude (1). Microbes have been collected using balloons, aircraft and meteorological rockets. Spore forming fungi and Bacilli, and Micrococci have been isolated in these experiments (1). It is not clear how high do microbes go up. If the microbes might have been present even at higher altitudes, the fact would endorse the possibility of interplanetary migration of life.
Tanpopo, dandelion, is the name of a grass whose seeds with floss are spread by the wind. We propose the analyses of interplanetary migration of microbes, organic compounds and meteoroids on Japan Experimental Module (JEM) of the International Space Station (ISS) (2). Ultra low-density aerogel will be used to capture micrometeoroid and debris. Particles captured by aerogel will be used for several analyses after the initial inspection of the gel and tracks. Careful analysis of the tracks in the aerogel will provide the size and velocity dependence of debris flux. The particles will be analyzed for mineralogical, organic and microbiological characteristics. Aerogels are ready for production in Japan. Aerogels and trays are space proven. All the analytical techniques are ready.
In this presentation, we will present the recent results related to the microbiological analyses. The results suggested that the bleaching speeds and the spectra of fluorescence are different between different origins of the fluorescence: whether it is emitted from microbe or not. It is also shown that PCR analysis of the microbe can be used to determine the species.

References
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2) Yamagishi, A., H. Yano, K. Kobayashi, K. Kobayashi, S. Yokobori, M. Tabata, H. Kawai, M. Yamashita, H. Hashimoto, H. Naraoka, & H. Mita (2008) Tanpopo: astrobiology exposure and micrometeoroid capture experiments. International Symposium on Space Technology and Science (ISTS) Web Paper Archives. 2008-k-05.

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