



TANPOPO mission:

Astrobiology exposure and capture experiments of microbes and micrometeoroid

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Our group have proposed the “Tanpopo mission” to investigate possible interplanetary transfer of microbes and organic compounds on Japan Experimental Module (JEM) of the International Space Station (ISS) (Yamagishi et al., 2008). TANPOPO, dandelion, is the name of a grass whose seeds with floss are spread by the wind. We are planning to capture micro-particles including microbes and micrometeoroids at the altitude of ISS orbit. We will also plan to capture the particles orbiting ISS. Silica gel with ultra-low density will be used as a capturing medium. The silica gel is called aerogel. Silica aerogel will be exposed to space for up to one year. After retrieving the aerogel, we will investigate captured micro-particles and tracks formed, followed by microbiological, organochemical and mineralogical analyses. We will stain the tracks and particles to detect microbial DNA with DNA-specific fluorescent dyes and observe the particles and tracks with a fluorescence microscope to detect microbes (Kawaguchi et al., 2014). Particles potentially containing microbes will be used for PCR amplification of rRNA gene followed by DNA sequencing.

The exposure experiment of microbes is another theme of the Tanpopo mission. We are going to investigate the viability of aggregated microbes at ISS orbit for a long term. We will expose the dehydrated microbial cells. After exposure experiment, we will analyze the survival rate of microbial cells. *Deinococcus* spp. will be used in the exposure experiment. The focuses of my study are to evaluate the scientific feasibility based on the ground experiment (Kawaguchi et al., 2013).

I'm going talk to overview of current Tanpopo mission, the preparation experiment on the ground and Japanese astrobiology studies.

Yamagishi A., et al. (2008) *Int Symp Space Tech Sci (ISTS) Web Paper Archives*, 2008-k-05.
Kawaguchi Y., et al., (2013) *Orig Life Evol Biosph*, 43, 411-428. Kawaguchi Y., et al. (2014) *Orig Life Evol Biosph*, in press.