
Introduction - Measuring theoretical recent life activity on Mars: Earlier studies revealed that the seasonal defrosting mechanism of the Dark Dune Spots (DDS) may be interpreted by events not only of defrosting and thawing processes but may involve activity of recently living Martian Surface Organisms, the MSOs (Horváth et al. 2001, Gánti et al. 2003) [1, 2]. Looking for terrestrial counterparts for MSOs have resulted in recognitions of extremophile bacteria and according to the suggestions of Pócs et al (2004) the main characteristics of the MSOs and their terrestrial counterparts are in coherence with those of the so called Crypto-Biotic Crusts (CBCs). The most important constituent of the terrestrial CBCs are the Cyanobacteria (Pócs et al. 2004) [3]. We propose that measuring of the main actors of the CBCs, the photosynthesizing cyanobacteria on the surface of Polar Mars should be a promising way of identification of Martian life. So if our goal is to find recent life on Mars, it can be tried by measuring energy transforming processes of the probably existing cyanobacteria on Mars.

Measuring proposal: Terrestrial experiments showed that photosynthesis of classical chlorophyll-containing plants can be measured according to the fluorescence emitted by the living plants. If Martian CBC-like living organisms emit fluorescence this effect can be measured on Martian near surface by an instrument which contains the miniaturized version of the fluorescence measuring subsystem. Moreover, the multiple pieces of such subsystem should be delivered and scattered on the Martian surface by a space probe.

Earlier works of Vizi (2012a) and Vizi et al (2012b) [4, 5] has shown that a new strategy of measuring surface parameters can be carried out by using dispersed „sugar cube” sized mini-satellites, or minispace probes. These units, like earlier the penetrators planned for Mars Polar Lander, should be thrown out from a landing space probe and this way they would be distributed on a large surface area. On the surface the measuring units start measuring the light energy capture and utilization processes of MSOs by the method, mentioned earlier. The data from the „sugar cube” measuring subsystems would be collected by the orbiting probe, or should be sent parallel onto the orbiting space probe sent with the mission or earlier deposited around Mars.

Target region: The target region to show these MSO photosynthesizing units are on the Dark Dune Spot, which spring began to exhibit living signals. The dormant MSOs get sunshine and begin to work and the sugar cube measuring units should be scattered and deposited into the dark region of the DDS. Such regions can be found in the 50-85 degrees latitudes of the southern hemisphere of Mars.

Measuring method: On the Earth the photosynthesis of cyanobacteria is tightly connected to other life processes and their photosynthetic activity is measur-
able by the chlorophyll fluorescence induction. Although, phycobilines also take a part of fluorescence in these organisms this method widely used not only to detect their photosynthetic activity but also it provides valuable information on their overall physiological status (Campbell et al. 1998) [7]. Under the earthly circumstances chl. fluorescence quenching analysis allows rapid and non-invasive measurement of key phenomena of photosynthetic light capture and electron transport processes. In the case of hypothetical MSOs, if they use the light energy for their life processes, a similar system might provide a proper method theoretically for the detection some features of their hypothetical energy transformation. In case, a pigment system absorbs a given frequency range of electromagnetic radiation, like on the Earth the photosynthetic pigment molecules, some characteristics of the use and transforming of excitation energy can be detected by a similar measuring system like fluorescence induction.

**Nano-sized robots:** All of necessary measuring systems are available in small enough size. With nanotechnology the size can be kept in a cubic inch range, e.g. light sources, spectrum of LEDs, the sensors, the photo diodes. Their low energy consumption for several milliseconds flashes during 5-10 minutes of operation.

**Distribution map of NPSRDs:** Over the distribution of NPSDR (as described in previous papers of Vizi et al. 2012) [4,5] the positions of NPSDRs are necessary to know.

**Summary** We have shown new ideas coming from nano technology and presented possible types of NPSDR. We summarized ideas how to detect and measure surface characteristics on planetary surfaces. In addition, we demonstrated one specific instrumental furniture for detection of living organisms at the dark dune spots during their seasonal defrosting changes. Our proposal is to put two containers of NPSDR onto a Mars space probe. During orbital maneuvers and landing the space probe drops the NPSDR units onto the Northern or Southern Polar Region of Mars.