



First assessment of radiation effects on a biochip in the case of a mission to Mars

A. Le Postollec (1,2), M. Dobrijevic (1,2), S. Incerti (3), P. Moretto (3), M. Baqué (4), O. Vandenaabeele-Trambouze (4), G. Coussot (4) and I. Desvignes (4)

(1) Université Bordeaux 1, Laboratoire d'Astrophysique de Bordeaux, FRANCE, (2) CNRS/INSU, UMR 5804, BP 89, 33270 Floirac, FRANCE, (3) Université Bordeaux 1, CNRS / IN2P3, Centre d'Etudes Nucléaires de Bordeaux Gradignan, UMR 5797, Gradignan, FRANCE, (4) Institut des Biomolécules Max Mousseron, Université Montpellier II, Montpellier, FRANCE (aurelie.lepostollec@obs.u-bordeaux1.fr / Phone: 0033557775682)

Detecting life in the Solar System is one of the great challenges of new upcoming space missions. One way to detect organic matter on extra-terrestrial objects might be the use of biochips. This miniaturized device is composed of biological sensitive systems, such as antibodies, that are immobilized on a slide. It allows the detection of specific organic molecules designed to sign life. In the case of *in situ* measurements (from samples extracted from the planetary soil), the main concern is to ensure the survival of the biochip all along the mission time. Space radiation effects seem to be one of the critical parameters requiring detailed investigations. Molecular recognition ability of the antibodies as well as slide's alterations need to be studied under space radiation conditions.

Accordingly to a recent model of the interaction of cosmic rays with the Martian environment (Le Postollec *et al.* 2008, *submitted*), neutrons should be present at a large amount at soil level. Consequently, to study the influence of these radiations on fluorescent antibodies and dyes, we recently performed neutrons irradiation experiments on a French beam facility (AIFIRA, in Bordeaux). Freeze-dried antibodies, antibodies in solution and their corresponding fluorescent dyes were studied under two different neutron beam energies. First results on their behavior under these irradiation conditions will be presented.