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IN VITRO AND IN VIVO PRO-INFLAMMATORY ACTIVITIES OF LUNAR AND MARTIAN DUST
SIMULANTS JSC-1 AND JSC-M-1.**Abstract**

In the last few years, NASA, in collaboration with the private industry, began developing a launch vehicle capable to send humans to the moon and to deep space destinations such as Mars. During the Apollo lunar missions, astronauts experienced respiratory problems following extravehicular activities as their space suits were contaminated with lunar dust. In 1994, a scientific team (McKay et al.) from NASA developed lunar (JSC-1) and mars (JSC-M-1) dust simulants in large quantities. These dusts, which derive from volcanic ash, are of similar chemical composition, shape and size than the originals. In this study, we investigate for the first time the effects of different concentrations of a homogeneous solutions of these dust in general inflammation. The role of these dusts in neutrophils, key players in inflammation, as well as their ability to induce inflammation in vivo remain poorly studied. Our preliminary in vitro results reveal that these dust stimulants do not affect neutrophil apoptosis contrarily to what has been observed with macrophages in a recent study. The experiments dealing on the role of the stimulants on other functions are in progress. Also, using the murine air pouch model, we intend to find if JSC-1 and JSC-M-1 dust can induce inflammation in vivo, based on recruitment of neutrophil and monocyte cell populations. The specific aim of this study is to determine if can these Lunar and Mars simulants can influence neutrophil cell physiology and possess pro-inflammatory effect in vivo.