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PHARMACEUTICAL EXCIPIENT INGREDIENT STABILITY IN MICROGRAVITY CONDITIONS, PACKING AND STORING RECOMMENDATIONS IN THE DEEP SPACE MISSIONS

Abstract

In growing demands on space medicine and safety of the humans in space, Our Team is ready to examine the experiment, Five pills of Ibuprofen (a non-steroidal anti-inflammatory drug commonly used for pain relief will be attached to the outside of cubesat for 5 months and Externally Mounted on the ISS, where they will be exposed to space radiation and microgravity. These pills might have surveyed or not but it can be taken from Earth to Mars and back again to help keep astronauts healthy, so we need to know how they will be affected by one of the harshest environments known: space. It has been shown that some medications on the ISS degrade more quickly than those on Earth. The proposed solution by The JSS University,India and its collaborators is to modify the excipients, which is the non-active ingredients of the drug, including its binding agents, coatings and colours. For example, heavier compounds, such as iron oxide or titanium oxide, may serve as a protective shield for the active ingredient against the space radiation which penetrates the spacecraft walls. The excipients have been chosen not only to be radioprotective for the active ingredient, but have also been chosen based on their abundance on the Moon in anticipation of the possibility of using lunar materials in-situ (ISRU) to manufacture these drugs in the context of a future lunar settlement. The 'space-ready' formulation contains added excipients including silica, talcum, iron oxide, titanium oxide, flavours, and calcium phosphate, all of which can be found on the lunar surface. Our concept proposes that astronaut crew quarters be made of water fillable structural panels, which would provide additional water storage capacity as well as deployable radiation protection in the event of a SPE. Secondary particles created by radiation travelling through barriers and packaging material may interact with the medications inside. Several polyethylene types including boron, water, and tungsten may be effective at absorbing primary radiation and preventing secondary radiation. Boron carbide composites, in particular, are lighter than traditional aluminum shields and have better tensile qualities than high-density polyethylene . Although labeled shelf-life estimates presume pharmaceuticals are protected from the environment by their original packaging, certain spaceflight medications are repackaged in specialized containers prior to flight. This bespoke packaging saves space and weight, but it may compromise pharmaceutical stability by changing exposure to heat, light, humidity, and gases; the packaging may also interact with pharmaceuticals.