

SPACEFLIGHT ENVIRONMENTAL-TELEMETRY DATA FOR BIOLOGICAL SCIENCE

Danielle K. Lopez¹, Ryan T. Scott¹, Jamie L. Bales², Ana E. Uriarte Acuna¹, Samrawit G. Gebre³, and Sylvain V. Costes³

¹KBR, Moffett Field, CA; ²Alidyne Consulting, Melbourne, FL; ³Space Biosciences Division, NASA Ames Research Center, Moffett Field, CA

There is a critical need for better access and visualization of spaceflight environmental telemetry and mission hardware data from sensors including relative humidity, carbon dioxide, oxygen, radiation, airflow, temperature, acceleration, and acoustics. Under the stewardship of the Ames Life Sciences Data Archive (ALSDA) and GeneLab, an effort is underway to consolidate, normalize and provide accessibility of archived mission environmental data and hardware information, with the purpose of providing important context to biological data. This effort is necessary to provide scientific context of its impact upon biological and biomedical data from spaceflight missions and experiments (genomic, metagenomic, gene expression, proteomic, metabolomic, physiological, phenomics, behavioral; tabular, imaging, video).

Environmental spaceflight data is derived from dozens of sources, with various formats, and in the past year a pipeline is in development to collect, curate and present this data efficiently. In the upcoming year, a new Data Visualization Portal will utilize the standardized pipeline data to provide easy user access to compare parameters and environmental conditions between missions, locations, subjects, and durations. Environmental and hardware data enables broad accessibility and analytics, without the need for advanced data informatic expertise. Familiarity with the capabilities and limitations of a variety of existing hardware/tools is a strength that could be applied to creation of improved hardware for future ecosystems on the Moon and Mars. The intention is to make biological and environmental telemetry data maximally open-access and FAIR (findable, accessible, interoperable, reusable) for data mining-informatic approaches to support knowledge discovery necessary for low Earth orbit, cis-Lunar, Mars transit, and Mars surface missions.