

Isolation, Identification and Curation of Spacecraft-Associated Microorganisms

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Spacecraft-Associated Microorganisms

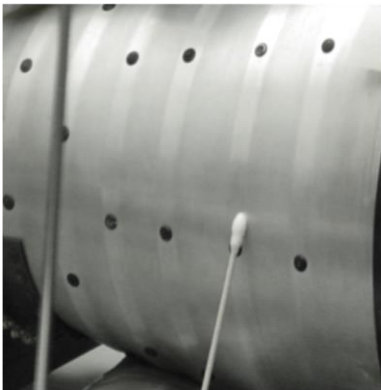
- Collection of 4000 isolates
- 7 Mars Missions
- 4 Main geographic locations
- Spacecraft and cleanroom samples
- Timeframe: 1974 to present

Purpose of the Archive Collection:

- Avoid forward contamination of Mars
- Avoid false positives for life detection
- A catalog of known organisms to compare with future planetary sample return

➤ Isolation

- Swab & Wipes surface sampling
- Heat Shock



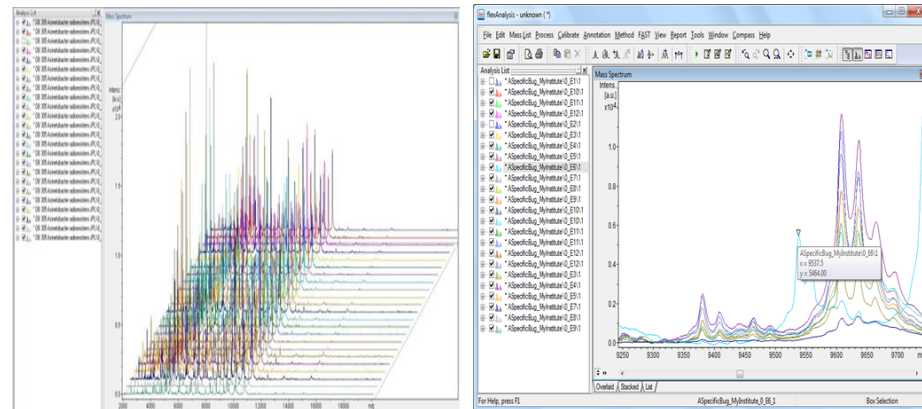
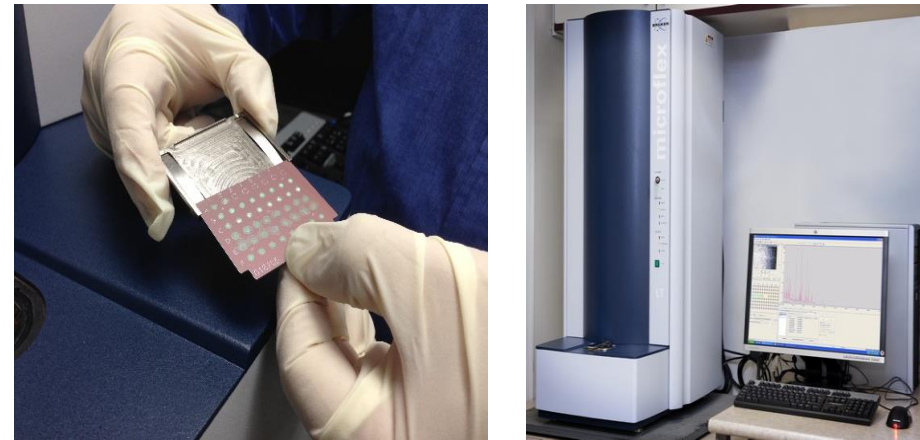
➤ Curation & Preservation

- Glycerol & Cryobeads, -80°C



➤ Identification

- Identification by MALDI-TOF mass spec
- Comparison to 16SrRNA gene sequence



Conclusions



- Spacecraft-associated organisms are not adequately covered in the standard commercial MALDI-TOF spectral database.
- Creation of a specific custom library for MALDI-TOF with 350 additional spectra has improved identification from 7% to greater than 70%
- 1600 16SrRNA gene sequences & rarefaction curve indicate we have not fully captured the diversity
- We are seeking partners to host a mirror-image collection

