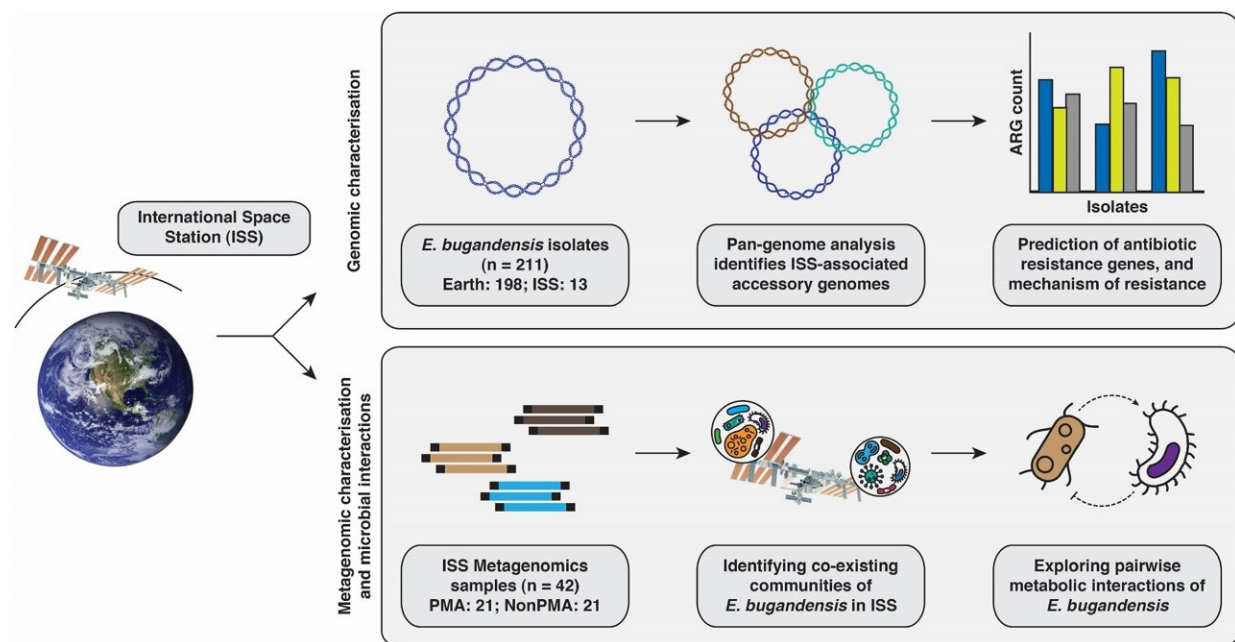


# Multi-drug resistant bacteria found on International Space Station mutate to become functionally distinct

April 17 2024, by Elizabeth E. Keller



Illustrative workflow showcasing the process of comparative genomics analysis of *E. bugandensis*, evaluating its prevalence and metabolic interactions within the microbial community, and its successful adaptation within the ISS habitat.

Credit: *Microbiome* (2024). DOI: 10.1186/s40168-024-01777-1

Principal Investigator Dr. Kasthuri Venkateswaran of NASA's Jet Propulsion Laboratory led a team that studied 13 strains of the bacterial

species *Enterobacter bugandensis* that were isolated from the International Space Station (ISS). *E. bugandensis* is a bacterium notorious for being multi-drug resistant.

Study findings indicate that under stress, the ISS isolated strains were mutated and became genetically and functionally distinct compared to their Earth counterparts. The strains were able to viably persist in the ISS over time in significant abundances. *E. bugandensis* coexisted with multiple other [microorganisms](#), and in some cases could have helped those organisms survive.

The research is [published](#) in the journal *Microbiome*.

Closed human-built environments, such as the ISS, are unique areas that provide an extreme environment subject to microgravity, radiation, and elevated carbon dioxide levels. Any microorganisms introduced to these areas must adapt to thrive. By delving into microbial dynamics in [extreme environments](#), this research opens doors to effective preventative measure for astronaut health.

**More information:** Pratyay Sengupta et al, Genomic, functional, and metabolic enhancements in multidrug-resistant *Enterobacter bugandensis* facilitating its persistence and succession in the International Space Station, *Microbiome* (2024). [DOI: 10.1186/s40168-024-01777-1](https://doi.org/10.1186/s40168-024-01777-1)

Provided by NASA

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