# Imperial College scientists test engineered microbes to produce food and supplies for space travel



Scientists from Imperial College London have launched an innovative mission testing the viability of engineered microbes to support future space travel by producing essential supplies such as food. The project centres on the use of specially designed yeasts capable of precision fermentation, a process that could enable astronauts to manufacture food, pharmaceuticals, fuels, and bioplastics while in space, potentially reducing the enormous costs and logistical challenges currently associated with carrying supplies on long-duration missions.

This initiative is headed by Dr Rodrigo Ledesma-Amaro from Imperial’s Department of Bioengineering, in collaboration with Cranfield University and industry partners Frontier Space and ATMOS Space Cargo. Their joint venture successfully sent a compact biomanufacturing laboratory into orbit aboard a recent spacecraft. This "lab-in-a-box" carries the yeast samples, allowing the team to study how these engineered microbes behave and produce substances under microgravity conditions experienced in space.

Dr Ledesma-Amaro, who is affiliated with the Bezos Centre for Sustainable Protein and the Microbial Food Hub at Imperial, explained the transformative potential of the research in a statement: "We dream about a future where humanity heads off into the dark expanses of space. But carrying enough to feed ourselves on the journey and at our destination would be unimaginable in cost and weight. We're excited that this project makes use of academic and industry expertise in physics, engineering, biotech and space science - converging on this challenge. If just a handful of cultivated cells could provide all our food, pharmaceuticals, fuels and bioplastics using freely available resources, that would bring the future closer."

This experimental unit operated autonomously in space and, after its return to Earth, the researchers will examine the impact of spaceflight variables such as microgravity, transport, and storage on the microbes' ability to function and produce the desired compounds.

Aqeel Shamsul, CEO of Frontier Space, emphasised the wider significance of this mission, stating, "This mission represents a major milestone in democratizing access to space research. Our SpaceLab Mark 1, 'lab-in-a-box' technology enables researchers to conduct sophisticated experiments in microgravity without the traditional barriers to space-based research. This project represents a significant opportunity to mature Frontier's technology, providing bio-experimentation solutions for space environments with the future space infrastructure post International Space Station."

The successful demonstration of this technology could have far-reaching consequences, potentially enabling sustainable food production and pharmaceutical manufacturing in deep space. Such advancements would support long-term human presence beyond Earth by reducing dependency on supply chains from Earth and minimising mission payload weights. This research thus marks a critical step towards autonomous biomanufacturing systems necessary for future interplanetary exploration.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.eurekalert.org/news-releases/1081279> - This article supports the claim that Imperial scientists are testing the production of food for space travel using engineered microbes. It highlights the project's aim to reduce logistical costs by using precision fermentation to create essential supplies like food and pharmaceuticals.
2. <https://www.spacedaily.com/reports/First_microbes_blast_off_testing_production_of_food_for_space_travel_999.html> - This report details the launch of a mission to test how engineered microbes can sustain future space travelers by producing food and other vital supplies in space.
3. <https://www.proteinproductiontechnology.com/post/imperial-scientists-launch-microbe-lab-to-test-food-production-in-space> - This article explains the launch of a miniature laboratory into Earth orbit to investigate the feasibility of using engineered microbes for food production in microgravity conditions.
4. <https://vegconomist.com/ingredients/space-mission-explores-microbe-based-precision-fermentation-solve-astronaut-food-challenges/> - This source discusses the use of microbe-based precision fermentation to solve food challenges in space missions by producing proteins, pharmaceuticals, fuel, and bioplastics.
5. <https://www.imperial.ac.uk/department/bioengineering/> - This link provides information about the Department of Bioengineering at Imperial College London, where Dr Rodrigo Ledesma-Amaro is based. It supports the claim about his affiliation and the department's involvement in the project.
6. <https://www.bezoscentre.imperial.ac.uk/sustainable-protein/> - This webpage is related to the Bezos Centre for Sustainable Protein at Imperial College London, where Dr Rodrigo Ledesma-Amaro is affiliated. It supports his role in initiatives focused on sustainable protein production.
7. <https://news.google.com/rss/articles/CBMisgFBVV95cUxPd2ljQWk3MUI5SEE5ejFhVWVxYVVxX1ltZjZ1MFJ5dEJOVFlBMHNTVjBNY0xkTzBFYzU1eV82RHFEUDVoa3VZbXJLSnRyQ3dHS0Q3VndleWNvbzlINzBqQnU2UnloVG5xTVNQTnNKdUhVWG5MTENnb0N3YXVqVlhVcGFxNXZpMnhGQnpDX0dHTnRKS0RnWGdvNF92RjhwTmVYUkNLemwtSmhTMm1tYl82dnh3?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data