# Imperial College launches mission to produce food and supplies in space using engineered microbes



Scientists from Imperial College London have launched a pioneering mission to assess the potential of engineered microbes in supporting long-duration space travel by producing essential supplies such as food. As human endeavours in space exploration advance towards distant planets, the challenge of carrying sufficient provisions—including food, water, and fuel—has become increasingly complex and expensive. Notably, providing sustenance for a single astronaut in orbit can cost up to £20,000 per day.

This mission focuses on utilising engineered yeasts through precision fermentation to manufacture vital resources in space, thereby potentially reducing the need to transport large quantities from Earth. The research is spearheaded by Dr Rodrigo Ledesma-Amaro from Imperial College London’s Department of Bioengineering, in partnership with Cranfield University and industry collaborators Frontier Space and ATMOS Space Cargo.

Dr Ledesma-Amaro, also affiliated with the Bezos Centre for Sustainable Protein and the Microbial Food Hub at Imperial, explained the vision behind the project. Speaking to Space Daily, he said, "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."

The experiment involved dispatching a compact, self-contained “lab-in-a-box” biomanufacturing laboratory into Earth orbit, equipped with samples of the engineered yeast. Once returned to Earth, the researchers will evaluate how factors such as microgravity, space transport, and storage impact the microbes’ ability to function.

Aqeel Shamsul, CEO of Frontier Space, added perspective on the broader significance of this technology, 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 outcomes of this investigation may have far-reaching impacts, potentially revolutionising sustainable food production and pharmaceutical manufacturing in space environments. Moreover, it could inform the development of autonomous manufacturing systems vital for future deep-space missions. The collaboration between academic researchers and industry innovators highlights a multidisciplinary approach to addressing the complex logistical challenges of space exploration.

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

## References

* <https://www.imperial.ac.uk/news/263213/first-microbes-blast-testing-production-food> - This URL corroborates the launch of a miniature lab into Earth orbit containing engineered microbes aimed at producing food through precision fermentation, led by Dr Rodrigo Ledesma-Amaro from Imperial College London, in partnership with Cranfield University and companies Frontier Space and ATMOS Space Cargo. It also confirms the estimated cost of feeding an astronaut in orbit at £20,000 per day.
* <https://www.eurekalert.org/news-releases/1081279> - This source details the mission's objective to test yeast engineered to produce food, pharmaceuticals, fuel, and bioplastics in microgravity, highlighting Dr Ledesma-Amaro's role and his affiliation with the Bezos Centre for Sustainable Protein and the Microbial Food Hub at Imperial. It also emphasizes the multidisciplinary collaboration and the significant cost of astronaut food supplies.
* <https://www.spacedaily.com/reports/First_microbes_blast_off_testing_production_of_food_for_space_travel_999.html> - This article supports the claim that Imperial scientists have launched a mission to assess the use of engineered microbes to sustain astronauts on long-duration missions by producing essential supplies such as food and pharmaceuticals in space.
* <https://www.proteinproductiontechnology.com/post/imperial-scientists-launch-microbe-lab-to-test-food-production-in-space> - This source confirms the launch of a fully automated miniature laboratory into orbit aboard a SpaceX rocket, with a focus on testing how microgravity and space travel affect the function of engineered yeast to produce vital supplies, including food, bioplastics, pharmaceuticals, and fuel.
* <https://vegconomist.com/ingredients/space-mission-explores-microbe-based-precision-fermentation-solve-astronaut-food-challenges/> - This URL verifies that the mission involves genetically engineered microbes designed to produce proteins, pharmaceuticals, and fuel via precision fermentation to address the challenges of astronaut food supply during space missions.