

Drug Manufacturing in Space - The Next Big Thing?



California-based start-up Varda Space Industries wants to capitalise on the potential of unassuming satellites in Earth's orbit for pharmaceutical development. The company intends to conduct space research and discover improved and more efficient drugs, ultimately generating substantial profits.

Varda Space Industries successfully launched its first test mission on Monday - a satellite aboard a SpaceX rocket from Vandenberg Space Force Base in California. The company has confirmed that the satellite successfully separated from the rocket.

The rocket carries a 200-pound capsule. The purpose of this capsule is to carry drug research into microgravity.

The capsule is designed to carry an experiment from the launch. Once in orbit, the capsule separates and attaches to a satellite bus, which provides the necessary power, propulsion, and communication systems for navigation in space. Then the experiment is carried out by onboard machines to create key components of pharmaceuticals while in microgravity. By operating in a weightless state, these experiments are free from the constraints imposed by Earth's gravitational pull, allowing for more efficient research and development processes.

The initial mission will concentrate on researching ritonavir, a drug commonly used for HIV treatment and also included in the antiviral medication Paxlovid to combat COVID-19. The company aims to explore the potential benefits and improvements that microgravity conditions can offer for the development and effectiveness of ritonavir and related pharmaceuticals.

Once the experiment is completed, ground engineers will assess the readiness of the capsule for return. The satellite bus will initiate the capsule's descent towards Earth if approved. The capsule will re-enter the Earth's atmosphere utilising a parachute, and the pharmaceutical materials will then be retrieved for further analysis and study.

Varda has invested approximately \$40 million in its development efforts thus far and has sufficient funds to finance at least its initial four missions, even in the event of potential failures. If their current venture proves successful, Varda has ambitious plans for rapid business expansion. They aim to regularly launch satellite flights carrying experiments for pharmaceutical companies. The ultimate goal is to discover a ground-breaking drug with superior efficacy when manufactured in space.

The company envisions a future where their flights become regular, with their capsules streaking across the night sky like shooting stars, visible to observers on the ground. Varda also aims to establish a research platform on a private space station. This would allow pharmaceutical researchers to personally travel to the station, opening up new opportunities for scientific exploration and experimentation in microgravity environments.

The capsule is scheduled for its return journey around mid-July. There are still many uncertainties surrounding this plan. Questions remain about the viability and functionality of the company's platform, the capsule's ability to withstand the return journey from space, its cost-effectiveness compared to sending research to the International Space Station, and the interest of major pharmaceutical companies in partnering with Varda.

Only time will provide the answers to these questions. Nevertheless, it is indeed quite exciting to discover the potential abundance of pharmaceutical opportunities in the future of space exploration.

Source: [CNN](#)

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