

# NASA mission sends germs into space

May 5 2009, By Michael Torrice

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Millions of microbe astronauts will travel into space Tuesday aboard a NASA satellite. These germs are part of a mission led by the NASA Ames Research Center at California's Moffett Field to study how floating in space alters a medication's effectiveness.

On earth, doctors prescribe drugs to cure infections caused by [microbes](#) such as bacteria and yeast. The [NASA](#) team's goal is to understand how these germs respond to treatment in outer space.

Previous space experiments have suggested greater amounts of drugs are needed to kill microbes aboard an orbiting spacecraft, said mission manager Bruce Yost.

Yost and his team will measure the extent of these microbes' resistance to drugs on a new satellite called PharmaSat.

"It's a big crew safety issue," Yost said. "If you have to maintain the health of people on a long [space mission](#), the flight doctors need to know how to prescribe drugs appropriately."

After decades of space travel, scientists have observed that space changes human biology. When astronauts go on long space missions, they experience muscle atrophy, loss of [bone density](#) and a weakening of their immune systems.

Scientists believe the reduced gravity and higher levels of radiation in space cause these changes. But they have little information about how

these conditions affect other organisms, such as germs, that can infect humans. One effect of space's [extreme conditions](#) on microbes could be an increased resistance to drugs.

The NASA team decided to study brewer's yeast. Although these microbes are harmless to humans, they are a model for other germs that cause disease, Yost said.

The experiment will last only 100 hours and take place within the foot-long PharmaSat satellite.

"Everyone affectionately says it's about the size of a loaf of bread," said project manager Elwood Agasid.

After launching from NASA's Wallop Flight Center in Virginia on a Minotaur 1 rocket, PharmaSat will separate from the rocket and begin its orbit 285 miles above Earth.

As the craft races through [space](#) at 17,000 mph, NASA scientists will wake the dormant yeast with a shot of food.

Once the microbes start reproducing at a healthy rate, the satellite will start adding doses of an anti-fungal drug known to kill the microbes on Earth. PharmaSat will record how many yeast survive over time and beam the data back down to scientists.

Meanwhile, scientists on the ground will perform the same experiment in a laboratory and compare the death rates of the orbiting and Earth-bound yeast.

Although scientists will stop collecting data after six months, PharmaSat will remain in orbit to test the capabilities of small orbiting satellites for future biology experiments.

But its life will be short. The satellite will re-enter the Earth's atmosphere and burn up in four years, Yost said.

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