

NASA Publishes Report about International Space Station Science

September 10 2009

Advances in the fight against food poisoning, new methods for delivering medicine to cancer cells, and better materials for future spacecraft are among the results published in a NASA report detailing scientific research accomplishments made aboard the International Space Station during its first eight years.

The report includes more than 100 science experiments ranging from bone studies to materials' research.

"This report represents a record of science accomplishments during assembly and summarizes peer-reviewed publications to date," said Julie Robinson, program scientist for the station at NASA's Johnson Space Center in Houston. "As we enter the final year of station assembly, this report highlights the capabilities and opportunities for space station research after assembly is complete."

One of the most compelling results reported is the confirmation that the ability of common germs to cause disease increases during spaceflight, but that changing the growth environment of the bacteria can control this virulence. The Effect of Spaceflight on Microbial Gene Expression and Virulence experiment identified increased virulence of space-flown *Salmonella typhimurium*, a leading cause of food poisoning. New research on subsequent station missions will target development of a vaccine for this widespread malady.

Another experiment produced a potential medical advance,

demonstrating a new and powerful method for delivering drugs to targets in the human body. Microgravity research on the station was vital to development of miniature, liquid-filled balloons the size of blood cells that can deliver medicine directly to cancer cells. The research was conducted for the Microencapsulation Electrostatic Processing System experiment.

One of the most prolific series of investigations aboard the station tests how spacecraft materials withstand the harsh space environment. The results of the Materials International Space Station Experiment already have been used to develop solar cells for future commercial station cargo ships. This experiment has significantly reduced the time needed to develop new satellite systems, such as solar cells and insulation materials, and paved the way for materials to be used in new [NASA](#) spacecraft such as the Orion crew capsule.

The report compiles experiment results collected from the first 15 station missions, or expeditions, from 2000 to 2008. Results of some of the summarized investigations are complete. Preliminary results are available from other continuing investigations.

NASA's research activities on the station span several scientific areas, including exploration technology development; microgravity research in the physical and biological sciences; human physiology research; Earth science and education.

The report details 22 different technology demonstrations; 33 physical science experiments; 27 biological experiments; 32 experiments focused on the human body; Earth observations and educational activities. In addition to science important to long-duration human spaceflights, most findings also offer new understanding of methods or applications relevant to life on Earth.

In 2008, station laboratory space and research facilities tripled with the addition of the European Space Agency's Columbus Laboratory and the Japan Aerospace Exploration Agency's three Kibo scientific modules, adding to the capabilities already provided in NASA's Destiny Laboratory. In 2009, the number of crew members increased from three to six, greatly increasing crew time available for research.

The stage is set for increased station scientific return when assembly and outfitting of the research facility is completed in 2010 and its full potential as a national and international laboratory is realized. Engineers and scientists from around the world are working together to refine operational relationships and build on experiences to ensure maximum use of the expanded capabilities.

The [International Space Station](#) Program Scientist Office at NASA's Johnson Space Center published the report. A link to the full NASA Technical Publication, which provides an archival record of U.S.-sponsored research through Expedition 15, is available at: ntrs.nasa.gov/archive/nasa/cas ... 29998_2009030907.pdf

Provided by JPL/NASA ([news](#) : [web](#))

Citation: NASA Publishes Report about International Space Station Science (2009, September 10) retrieved 9 April 2024 from <https://phys.org/news/2009-09-nasa-publishes-international-space-station.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--