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SpaceX Dragon Spacecraft with NASA, Ames Cargo Set for Return to Earth

May 16, 2014



This image of SpaceX Dragon grappled by Canadarm2 was sent down by Flight Engineer Steve Swanson to Instagram with the message, "We have a Dragon. All is good."

Image Credit: NASA

NASA Television will provide live coverage of the departure of the SpaceX Dragon spacecraft from the International Space Station beginning at 6 a.m. PDT Sunday, May 18, 2014. After leaving the space station, the capsule will splashdown in the Pacific Ocean carrying more than 3,500 pounds of NASA science samples and cargo such as four payloads supported by NASA's Ames Research Center in Moffett Field, California, including:

Seedling Growth-1 is the first in a series of joint NASA-European Space Agency (ESA) experiments to help us better understand plant growth in space. It studies how plants adapt to micro- and low-gravity environments and aims to help researchers determine the ability of plants to provide a complete, sustainable, dependable and economical means for human life support in space. The project is supported by NASA's Space Biology Project at Ames and ESA. The principal investigators are John Z. Kiss of the University of Mississippi in Oxford, Mississippi, and F. Javier Medina of the Spanish National Research Council (CFSC) in Madrid, Spain.

T-Cell Activation in Aging is an investigation of the genetic and molecular mechanisms that underlie diminished T-cell activation that occurs in the aging population and astronauts. T-cell activation is a critical event during which T-cells, which are specialized immune system cells, recognize infections within the body and initiate a defensive response. The National Institute on Aging, part

of the National Institutes of Health, is the sponsoring agency for the mission. Ames was the implementation partner and provides science team support to the principal investigator. ESA developed the payload and provides experiment hardware, payload integration and operations support for the mission. Millie Hughes-Fulford, former NASA Astronaut and researcher at Northern California Institute for Research and Education at the San Francisco Veterans Affairs Medical Center, is the principal investigator.

Micro-7 was the first spaceflight study of gene and microRNA expression in non-dividing cells. The study is investigating how spaceflight affects the response of non-dividing cells to DNA damage. The data from Micro-7 will provide insight into how gene expression regulates cellular adaptation to spaceflight and the specific role of microRNA in this process. Missions conducted in deep space—such as a mission to Mars—will expose crew members to higher levels of DNA-damaging radiation than on Earth or in low-Earth orbit. Knowledge of how cells adapt to spaceflight and whether microgravity affects cellular response to DNA damage is important for assessing future health risks for astronauts and predicting mutation rates for microorganisms. This experiment is supported by NASA's Space Biology Project at Ames and BioServe Space Technologies at the University of Colorado, Boulder. Honglu Wu of NASA's Johnson Space Center in Houston is the principal investigator.

Heart Effect Analysis Research Team conducting Fly Investigations and Experiments in Spaceflight (HEART FLIES) uses the fruit fly, *Drosophila melanogaster*, to study the effects of spaceflight on the structure and function of the heart. Investigators will evaluate heart rhythm, contractility, pumping function and heart muscle structure in both space-flown and ground-based control flies, and also will characterize the effects of spaceflight on gene expression patterns in heart tissue. This experiment is supported by Ames, Stanford University, the Sanford-Burnham Medical Research Institute, Nanoracks LLC., and Center for the Advancement of Science in Space (CASIS). HEART FLIES was competitively selected for payload transportation to the space station by the Space Florida International Space Station Research Competition. Peter H.U. Lee is the principal investigator for this experiment. Lee was at Stanford University at the time of the grant award, and now works in the Department of Surgery at Ohio State University Wexner Medical Center. Sharmila Bhattacharya of Ames, and Rolf Bodmer and Karen Ocorr of the Sanford-Burnham Medical Research Institute in La Jolla, Calif., are co-investigators.

Seedling Growth-1 was launched to the space station in March 2013 aboard the second flight of the SpaceX Dragon. T-Cell Activation in Aging, Micro-7 and HEART FLIES were launched aboard the third SpaceX resupply flight on April 18. The third Dragon capsule is set to be detached from the Earth-facing side of the station's Harmony module and unberthed through commands sent by robotic ground controllers at mission control in Houston operating the Canadarm 2 robotic arm. Dragon then will be maneuvered into place for its release scheduled for approximately 6:25 a.m.

Dragon will execute three thruster firings to move away from the station to a safe distance for its deorbit burn at 11:10 a.m. Dragon will splash down around 12:05 p.m. in the Pacific Ocean west of Baja California. Neither the deorbit burn nor the splashdown will be broadcast on NASA TV.

Dragon is the only space station resupply spacecraft designed to return to Earth intact. Among the 3,563 pounds of return cargo are science samples from human research, biology and biotechnology studies, physical science investigations and education activities. The spacecraft also will return crew supplies, vehicle hardware and spacewalk equipment.

Dragon was launched on a SpaceX Falcon 9 rocket from Cape Canaveral Air Force Station in Florida on April 18 on the company's third contracted commercial resupply mission to the station. Dragon arrived to the space station on April 20 with approximately 5,000 pounds of supplies aboard.

For NASA TV schedule and video streaming information, visit: <http://www.nasa.gov/nasatv>

For more information about Ames' contributions to the SpaceX-3 mission, visit: <http://www.nasa.gov/ames/spacex-3>

For more information about SpaceX's mission to the International Space Station, visit: <http://www.nasa.gov/spacex>

For more information about the International Space Station, visit: <http://www.nasa.gov/station>

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