



Nanoracks

ISS National Lab Request for Proposal:

"Assessing QD-cell interactions for safer biomedical use in the microgravity environment"



(Above) ESA astronaut Alexander Gerst uses a uses a pipette to transfer a protein solution into the Protein Crystal Growth Card for an experiment observing protein crystals associated with Parkinson's disease to potentially improve treatments on Earth. Credit: NASA



ISS

U.S. NATIONAL LABORATORY

Nanoracks, LLC
503 Forge River Road
Webster, TX 77598

Nanoracks Primary POC:
Scott Rodriguez
srodriguez@Nanoracks.com
832-755-0948

Nanoracks Secondary POC:
Michael D. Lewis
mlewis@Nanoracks.com
303-819-6722

I. OVERVIEW OF IMPLEMENTATION PARTNER'S OFFERINGS AND EXPERTISE

Nanoracks' facilities for the International Space Station (ISS) U.S. National Laboratory comprise a full commercial spacelab for a wide range of on-station microgravity research. Since 2009, Nanoracks has developed and installed 15 different research platforms for the ISS U.S. National Laboratory and flown over 1,300 payloads.

The company's customers range from high schools to universities, from commercial research organizations to non-ISS partners. Nanoracks' customer support services involve payload manifesting, testing, and integration; processing the payload through the NASA safety review; coordinating with NASA for on-orbit operations, and pre- and post-launch logistics, including consultation on payload design.

II. PROPOSED HARDWARE TO BE USED

Based on your requirements, Nanoracks proposes the use of existing ISS equipment, namely payload freezers for transport, and the Nanoracks-owned Plate Reader for use as an incubator and fluorescence reading capabilities. Nanoracks has performed similar activities on the ISS and has pioneered advances in this process using standard multi-well microplates and the Plate Reader and all proposed experiment components have flight heritage with successful experimentation.



Astronaut Kate Rubins performing Nanoracks Plate Reader operations on ISS

III. SUMMARY OF SERVICES

Nanoracks navigates all the necessary NASA safety documentation and ground/flight operations required to fly your experiment to space so that you can focus on your research.

Design & Build: It is proposed that standard multi-well microplates are utilized for this experiment. The Nanoracks Plate Reader will be used for the experiment, and is already operational aboard the ISS. Additionally, all support equipment for filling and sample collection have already been procured. If any additional hardware is required Nanoracks has full design and manufacturing capabilities.

Pre-Launch Ground Operations, Documentation & Testing: Nanoracks will take delivery of the payload and assure it complies with the NASA safety requirements required for flight and operation on the ISS. Nanoracks can perform last-minute payload activities at the Nanoracks facilities prior to final packaging. Nanoracks also can arrange all thermal controls during transport and on orbit with NASA. Nanoracks is responsible for delivery of the completed payload assembly to NASA for flight packing.

Launch: Nanoracks prepares payload for stowage, including proper accommodations for temperature control. NASA delivers the final stowed configuration to the launch vehicle team. On-site payload preparation facilities are available, as well as “late as possible” loading options.

On-orbit operations: Nanoracks creates protocols and schedules all ISS activities, including de-stow, unpacking, installation, and crew time to run and return the experiment. The Nanoracks Houston office runs a fully equipped ISS operations center and coordinates with the PI while the experiment is being conducted on the ISS.

Return: Nanoracks arranges the return of your payload to you from the ISS, assuring your payload is returned with the proper temperature control, in this case inside one of the available cold stowage options.

All services, requirements, and interfaces will be defined in the Interface Control Agreement (ICA), which will be developed based on the available payload data.

IV. ROUGH SCHEDULE

Activity	Date
Contract signing, experiment name, and general payload information	L -10 (10 months before scheduled launch) to No Later than (NLT) L-8.5 months
Submittal of initial manifest request	NLT L-6 months
Detailed information for Safety and Operations Documents	NLT L-6 months
Submittal of NASA Phase 0-2 Safety Data Package (SDP)	L-5.5 months
Complete hardware testing	L-5.5 to L-4 months
Submittal of procedures inputs and payload requirements	L-5.5 to NLT 3.5 months
Submittal of NASA Phase 3 Safety Data Package (SDP)	NLT L-3.5 months
NASA Phase 3 Safety Review Close Out and Final Approval	L-2 months to L-2.5 weeks
Turnover to NR for final testing and prep	L-11-13w days to NLT L-32 hours
Turnover to NASA for Launch	L-30 days to NLT L-24 hours
Flight Operations	L+1 month to L+3 months
Payload Return to Customer	L+4 months to L+12 months

V. ROUGH COST RANGE

End to End Mission Integration and Operations

Includes Return of payload samples

Cost: \$212,000



Researcher loading Nanoracks Microplate Reactors on the ground.
The Microplate Reactors have the same dimensions as a standard multi-well microplate.