

NASA Request for Information (RFI) on Developing a “NASA Space Life and Physical Sciences (SLPS) GeneLab ISS Reference Mission” that will be used to Collect, Manage, and Distribute “Omics-type” Data Collected in the Course of Space Biology Research

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This is a Request for Information (RFI) only and does not constitute a commitment, implied or otherwise, that the National Aeronautics and Space Administration (NASA) will take procurement action in this matter. The information gathered will be used by NASA to make decisions regarding the development of one or more “Design Reference Missions” for the collection, management, and distribution, or access to, Omics-type data collected in the course of space biology research on the ISS.

Responses to a series of specific questions must be submitted electronically using the NSPIRES web site by opening the NASA Research Opportunities homepage at <http://nspires.nasaprs.com> and then clicking the link through the menu listings "Solicitations" to "Open Solicitations."

Background

NASA has started a new Space Life Sciences research project called GeneLab. The GeneLab project will conduct strategic missions sponsored by NASA's Space Life and Physical Sciences Division, through its Space Biology Program, part of the Human Exploration and Operations Mission Directorate (HEOMD). A key goal of these missions is to encourage and facilitate the integration of various types of bioinformatics analytics from Space Life Sciences experiments such as genomic, transcriptomic, metabolomic, and proteomic data, also known as “omics”, in a modern bioinformatics environment. The GeneLab project will include:

- A Space Life Sciences database, that NASA is developing
- Computational tools that NASA will develop and/or deploy, and
- Improved methods to facilitate sharing of unique space life science data obtained from design reference spaceflight experiments as well as legacy data from other experiments.

NASA seeks inputs to this RFI so that it can design reference experiments needed by the Space Life Sciences community. NASA will establish an internal Science Definition Team (SDT) including only NASA Civil Servants. The SDT will use the community inputs provided by respondents to this RFI to design one or more reference experiments/investigations. NASA will subsequently hold a workshop with the Space Life Sciences community to refine the experiment(s) designed by the SDT. NASA will seek consultants from the science community and CASIS to be an integral part of the SDT efforts. NASA will use the results of the workshop to finalize the experiment/ investigation and will conduct the reference flight experiment, which will be managed and implemented by NASA to generate standard, common, public datasets. These GeneLab datasets will act as a powerful resource for scientific throughput and innovation. During the planning and implementation of the design reference mission, external community members and CASIS could be brought in to consult with NASA to maximize the results of the investigation. Once released, the results will be used to issue open solicitations for proposals from the science community for further analysis and ground based translational research

The GeneLab project plan and its goals are described at:
<http://genelab.nasa.gov/discovery-genelab-strategic-plan.html>

Responses to This RFI

The National Aeronautics and Space Administration (NASA) invites scientists, technologists, and other qualified and interested individuals to submit ideas about the content and goals of potential SLPS GeneLab ISS Reference Mission to advance the scientific priorities detailed in the National Research Council's Life and Physical Sciences Decadal Survey, entitled "Recapturing a Future for Space Exploration: Life and Physical Sciences Research for a New Era," (the Decadal Survey is available at <http://www.nap.edu>).

Inputs received in response to this RFI will be considered by NASA, which will establish an internal SDT that will design an ISS Reference Mission. Members of the first GeneLab SDT will provide NASA with scientific assistance and direction during preliminary concept definition activities for an experiment that will utilize one of 2 existing ISS hardware capabilities. The first hardware capability will involve Commercial Generic Bioprocessing Facility (CGBA) and the hardware second capability will involve the Biological Research in Canisters (BRIC) hardware. Information about this hardware and its past use in flight experiments can be found at: http://www.nasa.gov/mission_pages/station/research/experiments/CGBA.html and http://www.nasa.gov/mission_pages/station/research/experiments/708.html

The SDT will work collaboratively to design, with cooperation from the research community, one or more space experiments that will provide results of broad scientific utility. NASA will then conduct the reference experiment. After the completion of the reference experiment, NASA will place the results of the experiment in the GeneLab database and issue open solicitations for proposals to the science community for research and interpretation of the results in the GeneLab database.

Activities of the SDT will include:

- The establishment of baseline mission science objectives and a realistic scientific concept of operations for biological specimen that can be accommodated using this hardware; and
- Specifications of a strawman reference experiment payload as proof of concept; and suggestions for threshold science objectives/measurements for a preferred mission viable within resource constraints provided by NASA Headquarters.

NASA will use the products developed by the SDT to develop a NASA Science Requirements Document (SRD). The SRD will outline the primary science objectives of the baseline GeneLab reference mission and determine the investigations (e.g. strains, time-points, procedures, processes, and others) comparing spaceflight to terrestrial conditions. The SDT will be formed January 1, 2016. The reference mission SRD will be posted on GeneLab and NSPIRES websites. NASA estimates that the design reference experiment work should be completed by July 1, 2016.

Ninety days prior to the execution of the reference experiment, the specific experimental parameters and conditions defined by the NASA SDT with community inputs will be posted on the GeneLab website, and advertised via NSPIRES.

After the experiment is completed, all reports and output materials of the GeneLab SDT will be made publicly available via a technical memorandum posted on the GeneLab and NSPIRES websites. The SDT will communicate with the Space Life Sciences community and issue open solicitations regarding research and interpretation of the data gathered during the conduct of the reference mission in follow-on derivative ground-based or flight experiments. SDT members will not be eligible to submit a proposal in response to subsequent GeneLab NRAs to use the data resulting from the reference experiment. No non-public data will be used by the SDT for their work. The formal NASA charter for the GeneLab SDT will be posted to the NASA HEOMD-NSPIRES website.

Information Sought

NASA is seeking information from all interested parties in two areas through a series of questions by accessing the NSPIRES web site listed above.

This is not a solicitation announcement. If a solicitation is released it will be synopsisized in FedBizOpps and on the NASA Acquisition Internet Service. It is the potential offeror's responsibility to monitor these sites for the release of any solicitation or synopsis. This Sources Sought Synopsis is for informational and planning purposes only and is not to be construed as a commitment by the Government nor will the Government pay for any information solicited. The issuance of this Request for Information does not obligate NASA to accept any of the responses. Any costs incurred by an applicant in preparing a submission in response to this Call are the responsibility of the applicant.

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