NSF/CASIS Collaboration on Tissue Engineering and Mechanobiology on the International Space Station to Benefit Life on Earth

The Center for the Advancement of Science in Space™ (CASIS™) requests that offerors submitting a proposal to the NSF/CASIS Collaboration on Tissue Engineering and Mechanobiology solicitation read the following sections and provide the Feasibility Review Form and the Feasibility Compliance Form directly to CASIS in response to these areas. Please submit these inputs before January 15, 2025, through the instructions at https://issnationallab.org/opportunities/rfp2025-3. The Feasibility Review Form (no more than 3 pages) and the Feasibility Compliance Form (1 page) should be combined into one document for submission.

Feasibility Review Form (no more than 3 pages)

Project Summary

Please describe the proposed project. An abstract or a less technical and more generalized overview are both appropriate. It is essential for this section to include:

A. A clear statement of the hypothesis and the success criteria for the experiment

B. A brief overview of the expected International Space Station (ISS) National Laboratory experiment operations and crew interaction

C. A summary describing why the ISS National Lab is a necessary platform for this research (e.g., a need for exposure to long-term microgravity)

Operational Approach

The operational approach section provides further details of the proposed experiment that are necessary to confirm feasibility.

A. *Spaceflight Experiments*: Offerors must provide estimates or suggested approaches on the below topics (ideal proposals will provide well-researched information):

- Operational Concept: Include a complete description of the project's flight segment requirements, including sufficient information to determine size, weight, power, in-orbit timeline, and facility requirements as well as any special launch and return phase support requirements (e.g., cold stowage, orientation), if applicable.

a) Flight Hardware: Clearly delineate existing or proposed flight hardware to be used in the project. Explain plans to integrate flight hardware into the project timeline. For more information on ISS National Lab Implementation Partners and existing flight hardware and ISS research facilities, please go to https://www.issnationallab.org/research-on-the-iss/solicitations/rfp2025-3/.

- Facilities and Other Resources: Describe the role and availability of ground or space facilities or technologies necessary to complete applicable preflight work, ground controls, and space operations.

B. *Ground-Based Experiments*: Clearly delineate ground-based experiments to be performed in preparation for flight and alongside flight experiments as controls. Specifically note the relevance and research plan for ground controls. Discuss comparisons with established ground experiments or space studies. Include enough data and experimental methods for reviewers to determine feasibility.

PRELIMINARY FEASIBILITY FORM EVALUATION CRITERIA

Operational feasibility will be evaluated based on the following criteria.

The ISS National Lab Operations team, which may consult with NASA and outside technical experts as needed, conducts a technical feasibility review of proposals to ensure payload viability and overall readiness/feasibility for flight. This review is an unscored, pass-fail initial screening; however, CASIS may consider an interview with the offeror(s) to clarify technical elements of the proposal, as well as the proposed budget and schedule, to make its determination. Specifically, the technical feasibility review considers the following elements (not a comprehensive list):

- Implementation Feasibility: Robustness of the design and plan for ISS operations, suitability of the proposed hardware to meet research objectives, and the offeror's experience to carry out the investigation.
    - Projected budget and time frame: Preflight development and testing considerations, time to flight, and time to completion
- Operational Feasibility:
    - Logistics: Proposed resources including necessary facility needs for ground testing and flight operations support, use of ISS crew for research support, power and data requirements, size, weight, transportation requirements, and sample life limits
    - Hardware: Availability, limitations, and appropriate planned use of existing hardware or the costs and feasibility of proposed new hardware development
    - Hazards: Procedures, situations, and materials that could potentially be hazardous and a plan to mitigate any identified issues
    - Minimum Success Criteria: Criteria are identified with a plan to collect data and complete the experiment
- Adherence: Supplied all requested documentation and information to aid in assessment
- Questions: Follow-up questions for the offeror(s), including as appropriate:
    - Revised methods/analyses and how results will be collected, analyzed, and interpreted
    - Awareness of potential barriers and ideas about alternative approaches

FULL PROPOSAL FEASIBILITY EVALUATION CRITERIA

After the full proposal is submitted to NSF, the ISS National Lab Operations team will conduct another technical feasibility review of the full proposal. CASIS may share proposals with NASA to assist in the feasibility review process. This review will be a scored review to reflect the operations risk and will be shared with NSF.

ISS National Laboratory
CENTER FOR THE ADVANCEMENT OF SCIENCE IN SPACE

NSF/CASIS Collaboration Solicitation Feasibility Compliance Form

Proposed Project Name:	
Project Type: ☒ Tissue Engineering/Mechanobiology ☐ Transport Phenomena	
Principal Investigator (PI):	
PI Citizenship Status: ☐ U.S. Person ☐ Non-U.S. Person	**PI Country of Citizenship (if non-U.S.):**
Co-Principal Investigator (Co-PI) (if applicable):	
Co-PI Citizenship Status: ☐ U.S. Person ☐ Non-U.S. Person	**Co-PI Country of Citizenship (if non-U.S.):**
Organization Legal Name:	
Organization Status: ☐ U.S. Entity ☐ Non-U.S. Entity	**Organization Address:**
Organization Type: ☐ Commercial ☐ Academic ☐ Government ☐ Nonprofit	
Organization Unique Entity ID:	**Email Address:**
Is this research or technology subject to U.S. export laws and regulations? ☐ No ☐ Yes, explain below	
How did you hear about this research announcement? ☐ ISS National Lab website ☐ Email ☐ News article ☐ Advertisement ☐ NASA ☐ NSF ☐ ISS Research and Development Conference ☐ Other conference ☐ Other (please describe):	

CASIS has permission to share the Feasibility Review Form with select NASA personnel for the purposes of reviewing operational feasibility. ☐ Yes ☐ No

The undersigned is an Authorized Representative of the Proposing Organization whose signature certifies that the responses included on this form are accurate, factual, and current as of the date of the signature. Any changes to this information must be submitted immediately to CASIS at PM@issnationallab.org.

Signature: _____

Prepared By: _____

Title: _____

Date: _____

Project Summary

[Provide an overview of the project here. See instructions for detail on content to provide.]

Operational Approach

[Provide an overview of the project's operational concept here. See instructions for detail on content to provide.]