



**June 15, 2007
NSBRI-RFA-07-02**

**National Space Biomedical Research Institute
One Baylor Plaza, NA-425
Houston, TX 77030**

NSBRI Announcement Soliciting Postdoctoral Fellowship Applications

**A Request for Applications for the
National Space Biomedical Research Institute**

**Notices of Intent Due: July 10, 2007
Applications Due: August 1, 2007**

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NSBRI Request for Applications Soliciting Postdoctoral Fellowship Applications

Summary of Opportunity

This National Space Biomedical Research Institute (NSBRI) Request for Applications (NSBRI-RFA) is soliciting applications for the Postdoctoral Fellowship Program. Postdoctoral Fellowships will be competitively available for two years in any laboratory in the United States carrying out space-related biomedical/biotechnological research in accordance with the NSBRI's goals. **The program is open to U.S. citizens, permanent residents, or persons with pre-existing visas obtained through their sponsoring institutions that permit postdoctoral training for the project's duration. To be eligible for this program, Postdoctoral Fellows may not have more than three years of previous postdoctoral training.** Selected Postdoctoral Fellows will become a **member of an integrated countermeasure development team** of the NSBRI.

The Postdoctoral Fellowship award will be funded as a stipend of \$40,000 for the first year with a 5% increase in the second year and will include an allowance for health insurance. Additional funding will be provided for travel to a mandatory NSBRI meeting of Postdoctoral Fellows at the annual NSBRI/NASA Investigators' meeting, a research team meeting, and a domestic scientific meeting of the Postdoctoral Fellow's choice. The Postdoctoral Fellow will also be expected to spend 3-5 days in Houston and at the NASA Johnson Space Center to become familiar with the research facilities and programs available at that institution (costs also covered by NSBRI). The time period for the Johnson Space Center visit will be arranged by the Fellowship Program and will occur during the summer of 2008.

A budget is not necessary for completion of an application. Funding is not provided for administrative costs, supplies or equipment. The Mentor is responsible for supervision of the NSBRI Postdoctoral Fellow and for providing necessary funds for supplies and equipment. After Postdoctoral Fellowships have been awarded, the NSBRI will work with the funded institutions to execute the awards, which will include development of a budget for funding. **Indirect costs will not be awarded to the funded institution.** Additionally, the NSBRI's traditional cost sharing of 10% of the funded award is welcomed, but not required, from institutions who receive awards for postdoctoral training.

Postdoctoral Fellowship Applicants must prepare proposals with the support of a Mentor and institution (university, national lab, etc.), and all proposals will be evaluated by a peer-review panel. Mentors should have previous experience training postdoctoral fellows and/or graduate students. **It is the responsibility of the Postdoctoral Fellowship Applicant to arrange for a Mentor.**

The research project will be a part of a countermeasure development team focused on advancing the research toward an applied intervention. Each Postdoctoral Fellowship Applicant must identify the countermeasure readiness level (CRL) and/or technology readiness level (TRL) the research proposal addresses. Postdoctoral Fellows should refer to Figures 1 and 2 in Appendix A for detailed descriptions of the CRLs and TRLs.

In order to facilitate electronic submission from the Institution at which the Postdoctoral Fellow will conduct the research, please note that the NSPIRES proposal submission system requires that the Mentor be identified as the Principal Investigator and the trainee be identified as the Postdoctoral Fellow.

In this NSBRI-RFA,

- Appendix A provides an introduction and overview of the goals, objectives, and research implementation strategies of NSBRI.
- Appendix B contains descriptions of the opportunity and eligibility, specific instructions for submitting a Notice of Intent, and instructions for proposal submission.
- Appendix C contains the standard instructions for responding to NSBRI Requests for Applications.
- Appendix D contains copies of the certifications required to be followed with any signed application.

The NSBRI's scientific and educational goals are to fund research and development that will result in the delivery of countermeasures to ensure the health of astronauts, and to apply findings from the research to benefit life on Earth. The NSBRI is committed to maintaining a strong, openly competitive, peer-reviewed research program. The Institute also aims to inspire the next generation of space life scientists. Proposals submitted in response to this NSBRI-RFA must address the research emphases described in this document (see Appendix B for more details). Those that do not will be returned without review.

Proposals that synergistically bridge multiple disciplines for the purpose of modeling the effects of microgravity on the human body, aid in the development and testing of countermeasures, or develop technologies that enable research in one or more NSBRI research areas are strongly encouraged.

All proposals will be evaluated for overall scientific and technical merit by a peer-review panel. Relevance to NSBRI's programmatic needs and goals will also be evaluated by NSBRI Management. The NSBRI's obligation to make award(s) is contingent upon the availability of appropriated funds from which payment can be made and the receipt of proposals that the NSBRI determines are acceptable for award under this NSBRI-RFA.

Inclusion of Women and Minorities in Research Involving Human Subjects – NASA and the NSBRI have adopted the NIH policy regarding this matter. Women and members of minority groups and their subpopulations must be included in NSBRI-supported biomedical and behavioral research projects involving human subjects, unless a clear and compelling rationale and justification are provided that inclusion is inappropriate with respect to the health of the subjects or the purpose of the research.

Participation in this NSBRI-RFA is open to all categories of organizations, industry, educational institutions, other nonprofit organizations, NASA laboratories, and other agencies of the U.S. government.

An electronic Notice of Intent from Postdoctoral Fellowship Applicants is requested, but not required, by July 10, 2007. Proposals must be submitted electronically by **August 1, 2007, 5:00 p.m. Eastern Time.** (See Appendix B of this NSBRI-RFA for specific instructions for these activities.)

The following items apply only to this NSBRI-RFA:

Solicitation NSBRI-RFA Identifier: NSBRI-RFA-07-02

Application Format Required: Electronic application using NASA's NSPIRES System
(See Appendix B for details)

Notices of Intent Due (not required): July 10, 2007

Proposals Due: August 1, 2007, 5 p.m. ET

Selection Announcement: Fall 2007

Funding Begins: Approximately 30-90 days following notification of selection

Selecting Official: Director, National Space Biomedical Research Institute

Information about the NSBRI and its existing research program is available from:

Associate Director
National Space Biomedical Research Institute
One Baylor Plaza, NA-425
Houston, TX 77030-3498
Telephone: 713-798-7412 ■ Fax: 713-798-7413
Email: director@www.nsbri.org

Information about the NSBRI Postdoctoral Fellowship Program is available from:

Sonia Rahmati Clayton, Ph.D., Project Coordinator
NSBRI Postdoctoral Fellowship Program
Email: postdoc@www.nsbri.org
Telephone: 800-798-8244

All prospective Applicants to this NSBRI-RFA are advised that the highest priority in all of NASA's programs is given to safety and mission assurance, occupational health, environmental protection, information technology, export control, and security. NASA's safety priorities are to protect (i) the public, (ii) astronauts and pilots, (iii) the NASA workforce (including employees working under NASA instruments), and (iv) high-value equipment and property. All proposals submitted in response to this solicitation are expected to comply with this policy.

NSBRI points of contact will be identified in selection letters to begin the funding process. Potential Postdoctoral Fellowship Applicants should read with care the program descriptions that are of interest and focus their proposals on the specific research emphases defined in this NSBRI-RFA.

Your interest and cooperation in participating in this effort is appreciated.

NSBRI Request for Applications Soliciting Postdoctoral Fellowship Applications

Introduction and Overview: Goals, Objectives and Research Implementation Strategies of NSBRI

NOTE: It is critical for Postdoctoral Fellowship Applicants to read carefully all of the instructions in this NSBRI-RFA. Each Appendix includes guidelines, requirements, and instructions for preparing and submitting proposals, and defines the administrative policies governing the particular components described in this NSBRI-RFA.

I. Introduction to NSBRI

NSBRI is a NASA-initiated and NASA-funded, nonprofit research consortium charged with developing biomedical countermeasures for potential health problems that could occur in astronauts either during long-duration spaceflight or on their return to Earth. The NSBRI's current program, aligned with the Vision for Space Exploration, consists of approximately 70 science and technology projects organized into research teams.

The NSBRI invites ground-based research applications to join an existing team in one of the following research areas:

1. *Bone Loss* – Addressing bone loss and weakening during spaceflight, and the inherent fracture risks.
2. *Cardiovascular Alterations* – Determining the effect of long-duration spaceflight on the heart and blood vessels and designing novel therapies to combat prolonged deconditioning.
3. *Human Performance Factors, Sleep and Chronobiology* – Investigating maintenance of high cognitive performance and vigilance despite environmental stress and sleep disturbances.
4. *Muscle Alterations and Atrophy* – Focusing on the loss of skeletal muscle mass, strength and endurance that accompanies spaceflight.
5. *Neurobehavioral and Psychosocial Factors* – Investigating methods and tools that can be utilized to enable crews to cope with stress, isolation and compatibility.
6. *Nutrition, Physical Fitness and Rehabilitation* – Developing methods to maintain health and fitness before, during and after spaceflights.
7. *Radiation Effects* - Determining the risks various types of radiation have for deleterious consequences, with an emphasis on acute effects, and mitigating these effects through countermeasure development, including pharmaceutical and nutritional interventions.
8. *Sensorimotor Adaptation* – Addressing the problems of space motion sickness and disorientation during flight and the postflight problems of balance and gaze disorders.

9. *Smart Medical Systems* – Developing new methods of non-invasive medical monitoring, diagnosis and therapy for use on space missions.
10. *Technology Development* – Developing small, low-power, and noninvasive instrumentation and other technological products to address physiological problems and research needs.

Each of the research teams consists of a set of coordinated and complementary projects focused on a common theme. Team management and coordination is the responsibility of the **Team Leader**. A Team Leader, assisted by an Associate Team Leader, heads each research team. Team Leaders play a pivotal role in guiding the Institute’s research program and in the ultimate success of the Institute. Their expertise and “hands-on” approach to research management add value across projects and across teams. The Team Leader is guided by the Bioastronautics Roadmap (BR, see Appendix A, Section III.), which is the cornerstone for developing the team’s integrated strategic research plan, the key to accomplishing the Institute’s mission.

II. NSBRI Mission and Infrastructure

NSBRI is responsible for the development of countermeasures and risk-mitigation strategies to alleviate the deleterious effects of long-duration spaceflight and for the support of applied space biomedical research directed toward this specific goal. Its mission is to lead a national effort in integrated, critical path space biomedical research that supports the Vision for Space Exploration by focusing on the enabling of long-term human presence in, development of, and exploration of space. This is accomplished by:

- designing and testing effective countermeasures to address the biological and environmental impediments to long-term human spaceflight;
- defining the molecular, cellular, organ-level, and integrated responses and relationships that ultimately determine these impediments, where such activity is essential for the development of novel countermeasures;
- establishing biomedical support technologies to maximize human performance in space, reducing biomedical hazards to an acceptable level, and delivering quality medical care;
- transferring and disseminating the biomedical advances in knowledge and technology to the general benefit of mankind; and
- ensuring open involvement of a diverse scientific community, industry, and the public at large in the Institute’s activities and fostering a robust partnership with NASA, particularly through NASA’s Johnson Space Center.

Institute Infrastructure

The NSBRI is governed by a consortium of twelve institutions: Baylor College of Medicine; Brookhaven National Laboratory; Harvard Medical School; The Johns Hopkins University; Massachusetts Institute of Technology; Morehouse School of Medicine; Mount Sinai School of Medicine; Rice University; Texas A&M University; the University of Arkansas for Medical Sciences; the University of Pennsylvania Health System; and the University of Washington. The Institute’s Headquarters are located in Houston, at Baylor College of Medicine.

This is an open solicitation. Consortium membership is not a requirement for Postdoctoral Fellowship Program participation.

An independent Board of Scientific Counselors is responsible for assuring excellence in the Institute's research program through independent external peer review. An External Advisory Council is responsible for advising Institute Management and the Board of Directors (comprised of, but not limited to, representatives from the senior management of each of the 12 NSBRI consortium-member institutions) concerning program strategy, tactical implementation and effectiveness. NSBRI also has a User Panel of former and current astronauts and flight surgeons responsible for assuring that the research program is focused squarely on astronaut health and safety. An Industry Forum of representatives from space- and biomedically-related industries advises and assists the NSBRI concerning Earth- and space-based applications for Institute research.

In addition to its research program, the NSBRI has developed a robust education and outreach program that takes advantage of the Institute's core research activities. The Institute coordinates its research activities with NASA through a joint NASA/NSBRI Steering Committee and other NASA/NSBRI strategic and tactical working groups.

III. The Bioastronautics Roadmap (BR)

In order to identify and make publicly known the biomedical risks of spaceflight and the research questions that must be answered to reduce those risks, NASA has developed the Bioastronautics Roadmap (BR). The BR is an interdisciplinary tool to assess, understand, mitigate and manage the risks to humans that are associated with long-term exposure to the space environment. It assumes an overarching strategy that integrates requirements, risks, risk factors, research and technology questions, tasks, deliverables, and risk mitigation with the intent of directing biomedical research in support of human spaceflight, especially human missions of exploration.

The BR is based in part on recommendations from internal NASA experts, NSBRI scientists, advisory committees representing the United States science community, task forces, and published reports (e.g., the National Research Council Space Studies Board's *A Strategy for Research in Space Biology and Medicine in the New Century*); the Aerospace Medical Advisory Committee; the NASA Task Force on Countermeasures; the International Space Life Sciences Working Group's publications on Radiation, Bone, Muscle, Cardiovascular, Human Factors, and Neuroscience Workshops; and the NASA Medical Policy Board Document.

The ultimate goal of the BR is to protect the health and safety of spaceflight crews by allowing NASA and the community of scientists to better define and focus research that is required for development and validation of operational health care "deliverables" in preventing, treating and rehabilitating spaceflight changes, and in creating and supporting appropriate habitation and medical care systems.

The current BR identifies 45 risks and 462 questions. A more extensive overview, as well as a list of all the risks and research and technology questions for the BR, should be reviewed by potential proposers at <http://bioastroroadmap.nasa.gov/index.jsp>.

Postdoctoral Fellowship Applicants must examine and understand the BR and specify in the proposal the rationale and evidence underlying the risks and research and technology questions the proposed research will address. An example is shown in Table 1 and can be used as a template for the Table requested as part of your proposal in Appendix B, Section V.B.3.e. NSBRI will perform a similar assessment to understand how the proposed research addresses the BR risks and research and technology questions. **Proposals that do not identify which BR risks and questions are being addressed will be returned without review.**

TABLE 1: EXAMPLE ONLY – Please complete a BR Form for your proposal.

| Hypotheses | Risk # (from BR) | R&T* Question Number (Bolded) and Question (from BR) | Specific Aim |
|---|---|---|---|
| In the hindlimb unloaded (HLU) rat model, the combined administration of zoledronate with parathyroid hormone affords greater protection against femur fracture, relative to treatment with either agent alone; all agents whether administered alone or in combination will enhance bone quality and reduce fracture risk, as compared to non-treated control animals. | Risk #1 Accelerated Bone Loss and Fracture Risk | 1d. What biophysical modalities, nutritional modifications, and pharmacological agents (alone or in combination) will most effectively minimize the decrease in bone mass due to extended hypogravity exposure? [ISS 1, Lunar 5, Mars 1] | #1: Measure bone mass and mineral density in HLU rats treated with zoledronate in the absence or presence of parathyroid hormone. |
| | Risk #1 Accelerated Bone Loss and Fracture Risk | 1b. Will a period of rapid bone loss in hypogravity be followed by a slower rate of loss approaching a basal bone mineral density (BMD)? What are the estimated site-specific fracture risks as one approaches basal BMD? [ISS 2, Lunar 5, Mars 1] | #2 Evaluate mechanical strength of femur in HLU rats treated with zoledronate in the absence or presence of parathyroid hormone. |
| Additional hypotheses as appropriate. | | | |
| *R&T = Research and Technology | | | |

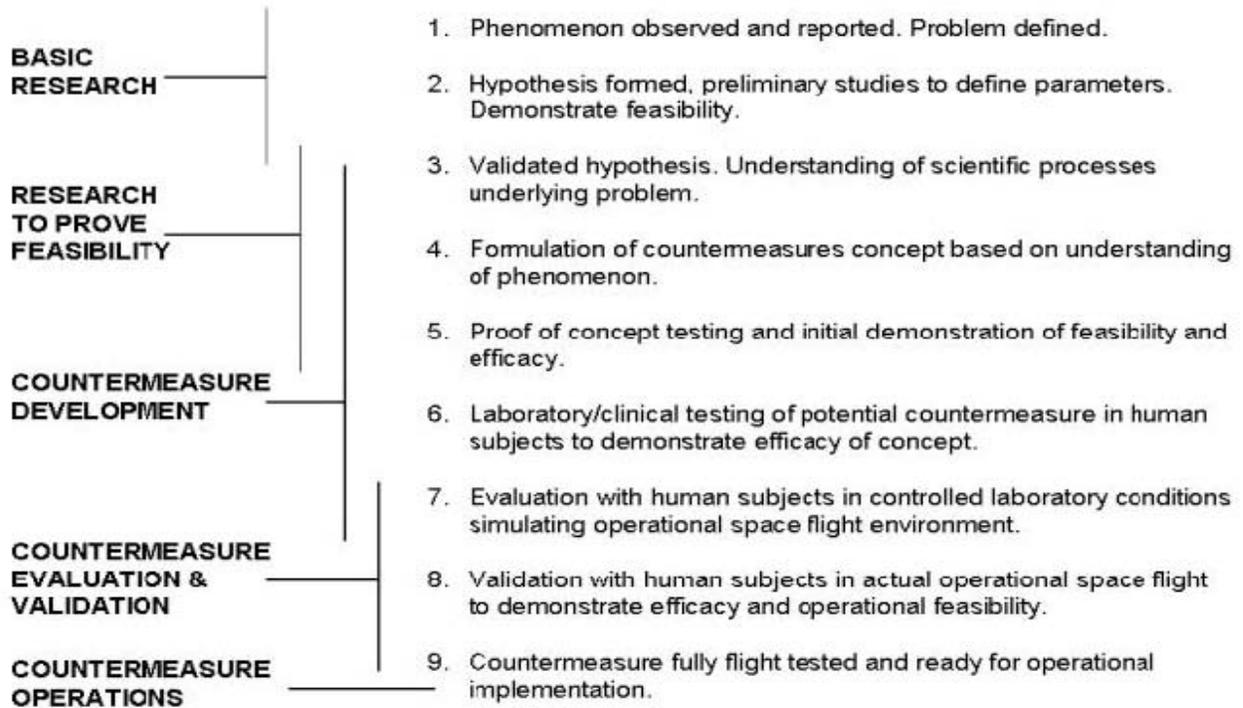
IV. Explanation of Countermeasure Readiness Level and Technology Readiness Level

Countermeasure Readiness Level (CRL)

The use of the CRL scale allows NASA and the NSBRI to: 1) define, assess and quantify the level of “countermeasure readiness;” 2) determine and describe how each funded research project fits into the countermeasure development “flow;” and 3) monitor progress in countermeasure development. This section describes this scale and how it is used. **The CRL of the proposed research must be identified in the application.**

Figure 1 illustrates the CRL scale. It describes an incremental research program ranging from fundamental studies that suggest potential countermeasures to applied studies that allow the systematic evaluation and validation of countermeasures ready for operational implementation. Countermeasure development usually progresses through systematic research. Research flows through various levels of countermeasure readiness.

Figure 1. Countermeasure Readiness Level Scale



Technology Readiness Level (TRL)

Technology Readiness Level is a systematic measurement system that supports assessments of the maturity of a particular technology and the consistent comparison of maturity between different types of technology. In short, a TRL is a technology milestone. (See Figure 2, next page.) **Technology projects must identify the TRL of the proposed research.**

Figure 2. Technology Readiness Level Scale

| <u>Level</u> | <u>Definition</u> |
|--------------|---|
| TRL1 | Basic principles observed |
| TRL2 | Technology concept and/or application formulated |
| TRL3 | Analytical and experimental critical function/proof-of-concept |
| TRL4 | Component and/or breadboard validation in lab |
| TRL5 | Component and/or breadboard in relevant environment |
| TRL6 | System/subsystem model or prototype demonstration in relevant environment |
| TRL7 | Subsystem prototype in a space environment |
| TRL8 | System completed and flight qualified through demonstration |
| TRL9 | System flight proven through mission operations |

V. Bibliography

1. **National Space Biomedical Research Institute Website.** <http://www.nsbri.org/> Contains information on the Institute's science, technology and education programs, including detailed team strategic plans and project summaries for all current and completed projects.
2. **Space Life Sciences Directorate Website.** <http://slsd.jsc.nasa.gov/>
3. **NASA Vision for Space Exploration.** Document available at: http://www.nasa.gov/pdf/55584main_vision_space_exploration-hi-res.pdf
4. **NASA Task Book (Program Tasks and Bibliography).** The Living Task Book and Task Book Archives are available at: http://taskbook.nasaprs.com/peer_review/index.cfm
5. **Space Life Sciences Data Archive (LSDA).** An online database containing descriptions and results of completed NASA-sponsored flight experiments. Descriptions are included of experiments, missions, procedures, hardware, biospecimens collected, personnel, and documents. Biospecimens that are available for research purposes are described in detail. A limited number of experiments contain final reports and spreadsheet data suitable for downloading. Data from human subjects are unavailable online for reasons of privacy. Internet address: http://lsda.jsc.nasa.gov/lsda_home.cfm
6. **Small Clinical Trials: Issues and Challenges.** Institute of Medicine, National Academy Press, Washington, DC. <http://www.nap.edu/books/0309073332/html/>

7. **Sex and Gender: Exploring the Biological Contributions to Human Health.** *NIH Guidelines on the Inclusion of Women and Minorities as Subjects in Clinical Research*, 59 Fed. Reg. 14508 (1994).
8. **Safe Passage, Astronaut Care for Exploration.** Institute of Medicine, National Academy Press, Washington, DC, (2001).

**NSBRI Request for Applications Soliciting
Postdoctoral Fellowship Applications**

Specific Details Related to the Request for Applications

NOTE: The program is open to U.S. citizens, permanent residents, or persons with pre-existing visas obtained through their sponsoring institutions that permit postdoctoral training for the project's duration. Please note that current restrictions at locations having high, security-clearance requirements may impede full participation in some learning experiences by persons who have certain visa classifications. To be eligible for this program, previous postdoctoral training must be limited to three years or less.

I. Research Opportunity – General Information

To carry out the NSBRI's primary mission of identifying, designing and developing effective countermeasures to address the biological and environmental impediments to human spaceflight, the NSBRI focuses its research program on the primary needs of long-duration missions (e.g., several months on the International Space Station and exploration-class missions to the moon and Mars). These missions pose the greatest challenge to present and future space travelers, and meeting these challenges with appropriate countermeasures lies at the core of the NSBRI's responsibility.

Potential physiological changes that may occur during prolonged spaceflight include, among others, significant loss of muscle and bone mass, decreased dietary intake of nutrients, metabolic and endocrine alterations, important changes in cardiovascular function, and deleterious effects on sensorimotor performance. By addressing long-term missions, increased crew safety, health and performance will be realized for shorter-duration spaceflights.

NSBRI research is conducted in partnership with NASA using an **integrated team approach**. The teams focus on high-priority biomedical research problems, and investigators work together, within and between teams, to address complex risks that often require interdisciplinary expertise and resources. The value added in the integrated team approach leads to more effective outcomes-driven research than what is obtainable by a single project alone.

The NSBRI has an essential enabling role for NASA: providing capabilities for countermeasures development research. The Institute engages scientists, engineers, and clinicians and uses institutional resources to form a biomedical research community. Countermeasures research conducted by NSBRI's research community is integrated with the engineering and operational expertise of NASA to effectively manage health risks for long-duration human spaceflight.

The CRL and/or TRL that will result from the funding and conduct of the proposed research must be identified in the proposal. For further information, refer to Appendix A, Section IV.

II. NSBRI Team-Specific Research Focus and Opportunity

Applications submitted to the NSBRI in response to this NSBRI-RFA must address one of the research areas discussed below. Proposals that impact more than one area should be directed to only one primary research area. Studies that use integrated methods are particularly encouraged.

It is recommended that Postdoctoral Fellowship Applicants carefully review the NSBRI website for information on the team(s) relevant to a proposal. These webpages are referenced in the following subsections, which are provided to guide proposers to the key problems and issues that are central to each research area. In all cases, proposals must represent questions and be relevant to priorities enumerated in the BR at <http://bioastroroadmap.nasa.gov/index.jsp>.

Proposals in problem modeling, space medicine and technology that are relevant to countermeasure development within the scope of the NSBRI mission are invited but must address one of the research areas discussed below. The NSBRI seeks innovative projects of two years in duration and of varying scope that will produce clear deliverables. Applicants are encouraged to define clear milestones and to collaborate with experts, as appropriate, to maximize the likelihood of success and impact of their proposed research.

1. NSBRI Bone Loss Team

The Bone Loss Team studies the processes involved in bone loss related to microgravity, the development of countermeasures to prevent bone loss, and methods for evaluating the rate of loss and the impact on fracture risk. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Bone.html>.

2. NSBRI Cardiovascular Alterations Team

The Cardiovascular Alterations Team is determining the effect of long-duration spaceflight on the heart and blood vessels and designing novel therapies for combating prolonged deconditioning. These strategies include training regimens as well as pharmacologic and nutritional interventions. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Cardio.html>.

3. NSBRI Human Performance Factors, Sleep and Chronobiology Team

The Human Performance Factors, Sleep and Chronobiology Team is developing ways to reduce human mistakes and optimize mental and physical performance during long-duration spaceflight. The loss of 24-hour day/light cycle, weightlessness, a confined environment, and work demands make sleep difficult in space. Cumulative sleep loss increases the risk of accidents and possible mission failure. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Sleep.html>.

4. NSBRI Muscle Alterations and Atrophy Team

The Muscle Alterations and Atrophy Team's objective is to develop methods to prevent or reduce muscle loss on space missions. While astronauts exercise in space, current exercise regimens alone are not sufficient to prevent potentially deleterious changes that occur in skeletal muscle during spaceflight. The Team works to identify effective physical countermeasures (i.e., exercise prescriptions) and to combine this strategy with other countermeasures, such as improved nutrition and pharmacological interventions. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Muscle.html>.

5. NSBRI Neurobehavioral and Psychosocial Factors Team

The Neurobehavioral and Psychosocial Factors Team is concerned with methods crews use to deal with stress, isolation, confinement, and the challenges of long-duration space missions. In addition to identifying neurobehavioral and psychosocial risks to crew health, safety, and productivity, Team objectives include developing methods to monitor cognitive function and behavior and countermeasures to enhance performance, motivation, and quality of life. Leadership style, crew composition, organization, and communication are also being investigated to optimize crew effectiveness and mission success. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Psycho.html>.

6. NSBRI Nutrition, Physical Fitness and Rehabilitation Team

The Nutrition, Physical Fitness and Rehabilitation Team is addressing the quality and quantity of dietary intake, exercise, and rehabilitation to reduce or eliminate muscle atrophy and bone loss, and to improve altered cardiovascular function. The Team is also examining countermeasures to reduce the biomedical risks of radiation, circadian alterations, and other factors associated with long-duration human space missions. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Nutrition.html>.

7. NSBRI Radiation Effects Team

Extended missions will expose astronauts to greater levels and more varied types of radiation. High levels of radiation may kill cells, damage tissue and cause mutations; other effects of acute exposure include prodromal syndrome, skin reactions and hematologic disorders. Through cross-cutting research projects, NSBRI is determining the risks of various types of radiation for deleterious consequences, with an emphasis on the area of acute effects, and the ability to mitigate these effects through the development of countermeasures, including pharmaceutical and nutritional interventions. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Radiation.html>

8. NSBRI Sensorimotor Adaptation Team

The Sensorimotor Adaptation Team is developing potential preflight and inflight countermeasures to allow crew members to adjust more rapidly to gravitational changes that can result in disorientation, motion sickness and a loss of sense of direction. These disturbances can impact operational activities including approach and landing, docking, remote manipulation,

extra-vehicular activity and post-landing normal and emergency egress. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Neuro.html>.

9. NSBRI Smart Medical Systems Team

The Smart Medical Systems Team is developing and applying new technologies for physiological and medical monitoring and clinical care that integrate novel hardware, intelligent algorithms and models, and new therapeutic approaches applicable for remote health care in the space environment and on Earth. The Team works closely with the Technology Development Team and the Space Medicine group at Johnson Space Center. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at http://www.nsbri.org/Research/Med_Sys.html.

10. NSBRI Technology Development Team

The Technology Development Team focuses on developing technology to influence and monitor the physiologic adaptation to weightlessness or reduced-gravity environments. Projects focus on designing lightweight, compact research tools and on developing simple, minimally-invasive and non-invasive methods of gathering health-related data that are relevant in space, on planetary surfaces such as a lunar outpost, and have Earth-based applications. Team information and the Team Strategic Plan for countermeasures research and development, including research goals and priorities, are located at <http://www.nsbri.org/Research/Tech.html>

III. Award Information

Selected proposals are expected to be funded for two years, with an assumed start date of October 1, 2007. This date is flexible, however, and will be negotiated with each selected Postdoctoral Fellow. The Postdoctoral Fellowship award will be funded as a stipend of \$40,000 for the first year with a 5% increase in the second year, and will include an allowance for health insurance. Additional funding will be provided for travel to a mandatory NSBRI meeting of Postdoctoral Fellows at the annual NSBRI/NASA Investigators' meeting, a research team meeting, and a domestic scientific meeting of the Postdoctoral Fellow's choice. The Postdoctoral Fellow will also be expected to spend 3-5 days in Houston and at the NASA Johnson Space Center to become familiar with the research facilities and programs available at that institution (costs also covered by NSBRI). The time period for the Johnson Space Center visit will be arranged by the Fellowship Program and will occur during the summer of 2008. The mechanism of support will be an NSBRI sub-cooperative agreement with funds provided by NASA through a cooperative agreement (Cooperative Agreement NCC 9-58) with NASA's Lyndon B. Johnson Space Center.

IV. Eligibility

A. Eligibility of Applicants

The program is open to U.S. citizens, permanent residents, or persons with pre-existing visas obtained through their sponsoring institutions that permit postdoctoral training for the project's duration. To be eligible for this program, Postdoctoral Fellows may not have more than three

years of previous postdoctoral training.

Research proposals will be accepted from all categories of organizations, public and private, and for profit and nonprofit, such as universities, colleges, hospitals, laboratories, units of state and local governments, and eligible agencies of the Federal Government. In most cases, only approved applications from U.S. institutions will be selected for funding. Postdoctoral Fellowship Applicants may collaborate with universities, Federal Government laboratories, the private sector, and state and local government laboratories. In all such arrangements, the applying entity is expected to be responsible for administering the project according to the management approach presented in the proposal.

The applying entity must have in place a documented base of ongoing, high-quality research in science and technology or in those areas of science and engineering clearly relevant to the specific programmatic objectives and research emphases indicated in this Request for Applications. Present or prior support by NASA or the NSBRI of research or training in any institution or for any investigator is neither a prerequisite to submission of an application nor a competing factor in the selection process.

B. Additional Guidelines Applicable to Foreign Applicants

The program is open to U.S. citizens, permanent residents, or persons with pre-existing visas obtained through their sponsoring institutions that permit postdoctoral training for the project's duration. Please note that current restrictions at locations having high, security-clearance requirements may impede full participation in some learning experiences by persons who have certain visa classifications. All proposals must be in English and comply with all other submission requirements stated in the NSBRI-RFA.

V. Application Procedures for the NSBRI Postdoctoral Fellowship Program

A. Source of Application Materials

All information needed to submit an electronic proposal in response to this solicitation is contained in this RFA and in a companion document entitled "Guidebook for Proposers Responding to a NASA Research Announcement (NRA)" (hereafter referred to as the *Guidebook for Proposers*) that is located at:

<http://www.hq.nasa.gov/office/procurement/nraguidebook/>.

In cases where the Guidebook for Proposers and this RFA conflict, the RFA language shall take precedence.

Proposal submission questions will be answered and published in a Frequently Asked Questions (FAQ) document. This FAQ will be posted on the NSPIRES solicitation download site alongside this RFA, and will be updated periodically between submission release and the proposal due date.

B. Content and Form of Proposal Submission

1. NSPIRES Proposal Data System

a) NSPIRES Registration

This RFA requires that the proposer register key data concerning their intended submission with the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES) located at <http://nspires.nasaprs.com>. Potential Applicants are urged to access this site well in advance of the proposal due date(s) of interest to familiarize themselves with its structure and enter the requested identifier information. It is especially important to note that every individual named on the proposal's *Cover Page* (see further below) must be registered in NSPIRES and that such individuals must perform this registration themselves; that is, no one may register a second party, even the Mentor of a proposal in which that person is committed to participate. This data site is secure, and all information entered is strictly for NSBRI use only. In NSPIRES, the Mentor is identified as the Principal Investigator (PI) and the Trainee is identified as the Postdoctoral Fellow.

Before beginning an online application, the Postdoctoral Fellow must ensure that:

- 1) The Organization to which the Postdoctoral Fellow is applying is registered with NSPIRES through an Authorized Organizational Representative (AOR)
- 2) The Mentor (PI) is registered with NSPIRES, and is affiliated with the Organization to which the Postdoctoral Fellow is applying
- 3) The Mentor (PI) knows the name of the Authorized Organizational Representative (AOR) of the Organization, and the AOR is registered with NSPIRES
- 4) The Postdoctoral Fellow is registered with NSPIRES

Every organization that intends to submit a proposal in response to this RFA, including educational institutions, industry, nonprofit institutions, NASA Centers, and other U.S. Government agencies, **must be registered in NSPIRES prior to submitting a proposal**. Such registration must be performed by an organization's electronic business point-of-contact (EBPOC) in the Central Contractor Registry (CCR).

NSPIRES help topics may be accessed through the NSPIRES on-line help site at <http://nspires.nasaprs.com/external/help.do>. For any questions that cannot be resolved with the available on-line help menus, requests for assistance may be directed by email to nspires-help@nasaprs.com or by telephone to 202-479-9376, Monday through Friday, 8 a.m. to 6 p.m. Eastern Time.

b) Electronic Submission

Proposals must be submitted electronically, and all proposers are required to use NSPIRES. NSBRI Postdoctoral Fellowship proposals must be submitted electronically by one of the officials at the Mentor's (PI) organization who is authorized to make such a submission. It is strongly recommended that the Postdoctoral Fellow work closely with his/her Mentor to ensure the proposal is submitted by the due date and time listed in this solicitation. Proposals

will not be accepted after the listed due date and time.

NSPIRES accepts fully electronic proposals through a combination of data-based information (e.g., the electronic *Cover Page* and its associated forms) and an uploaded PDF file that contains the body of the proposal. The NSPIRES system will provide a list of all elements that make up an electronic proposal, and the system will conduct an element check to identify any item(s) that is(are) apparently missing or incomplete. Note that a failed element check will not preclude submission, but rather it will serve as a warning that a proposal may be incomplete. Proposers are particularly encouraged to begin their submission process early. Proposers submitting a Notice of Intent (NOI) will have the option of building a proposal based on stored NOI information within the NSPIRES database.

Requests for assistance in accessing and/or using NSPIRES may be directed by email to nspires-help@nasaprs.com or by telephone to 202-479-9376, Monday through Friday, 8 a.m. to 6 p.m. Eastern Time. Frequently Asked Questions (FAQs) may be accessed through the Proposal Online Help site at <http://nspires.nasaprs.com/external/help.do>. Tutorials of NSPIRES are available at <http://nspires.nasaprs.com/tutorials/index.html>.

2. Notice of Intent to Propose

To facilitate planning for the review process, Applicants are requested to submit a Notice of Intent through NSPIRES by following the online instructions. **Notices of Intent must be electronically submitted by July 10, 2007**, through the NSPIRES website (<http://nspires.nasaprs.com>).

The Mentor (PI) must initiate the proposal for the Postdoctoral Fellow in NSPIRES. After logging in to NSPIRES, the Mentor will:

- 1) Select the "Proposals" link
- 2) Select the "Create NOI" link
- 3) Select "NSBRI Announcement Soliciting Postdoctoral Fellowship Applications" from the list of open solicitations
- 4) Create the NOI Title
- 5) Link the proposal to the Mentor's Organization
- 6) Save the NOI
- 7) On the "View NOI" page, select the "Proposal Team" link
- 8) Select the "Add Team Member" button
- 9) Search for the name of the Postdoctoral Fellow, select the Postdoctoral Fellow
- 10) On the "Add Team Member" page, Assign Role/Privileges to the Postdoctoral Fellow
- 11) Select "Postdoctoral Fellow Role"
- 12) Grant Edit privileges to the Postdoctoral Fellow
- 13) Select NO to the two questions that follow the section entitled "U.S. Government Agency & International Participation"
- 14) Click "Save"

After granting edit privileges, the Postdoctoral Fellow must complete the NOI application. The Mentor must submit the NOI to NSBRI after the Postdoctoral Fellow has completed

the application.

Please refer to the NSPIRES tutorial at <http://nspires.nasaprs.com/tutorials/index.html> for on-line help. All information entered will remain private until the electronic submission is completed. Please note that Notices of Intent are requested, but not required for submission of a Postdoctoral Fellowship Application. Failure to submit a Notice of Intent will not impact the selection process.

3. Instructions for Preparation of Proposals

As with the NOI, the NSPIRES system will guide proposers through submission of all required proposal information. Please note that previously submitted NOI information will be automatically transferred to the proposal. Please refer to the on-line NSPIRES tutorials at <http://nspires.nasaprs.com/tutorials/index.html> for help.

Proposals must be prepared by the Postdoctoral Fellow in conjunction with their Mentor. Proposals will be submitted by the Mentor (PI) and an official of the Mentor's organization after the Mentor (PI) has released the prepared proposal to the institution official (AOR). It is strongly recommended that the Postdoctoral Fellow work closely with the Mentor to ensure the proposal is submitted by the due date and time listed in this solicitation. Proposals will not be accepted after the listed due dates.

Only the Mentor can initiate the creation of a proposal. To create the proposal from a submitted NOI, the Mentor will:

- 1) Login to NSPIRES and click on "Proposals"
- 2) Click on the "Create Proposal" button in the upper right hand corner of the screen
- 3) Select "NOI" to prepare a proposal from the NOI submission
- 4) Follow the online instructions to save the NOI as a Proposal.
- 5) The Postdoctoral Fellow will then be able to complete the proposal application by following the step-by-step instructions provided in NSPIRES.

To initiate a new proposal without having submitted an NOI, the Mentor must create the new proposal, and assign the Postdoctoral Fellow as a team member with edit privileges as described in the NOI section. The Postdoctoral Fellow will then be able to access and create the proposal application.

Please note that the Proposal Summary, Business Data, Program Specific Data, and Proposal Team are required Cover Page Elements for a proposal. A budget is not required for this solicitation, and the budget forms do not need to be filled out. The proposal summary should be between 100-300 words and understandable by the layman reader.

NSPIRES allows for the upload of several proposal components as individual documents. However, to ensure proper proposal transmission, please provide only **one** PDF attachment upload ordered as follows:

1. *Mentor Support Statement (See V.B.3.a below)*

2. *Biographical Sketches for the Mentor and Postdoctoral Fellow (See V.B.3.b below)*
3. *Resource Facilities and Equipment (See Appendix C)*
4. *Research Plan (See V.B.3.d below)*
5. *Bioastronautics Roadmap Form (see V.B.3.e below)*
6. *Special Matters - Animal Care or Human Subjects certifications, if applicable (see V.B.3.f below)*
7. *References and Citations (See V.B.3.g below)*
8. *Appendices and Reprints (See V.B.3.h below)*

The proposal components listed above must be uploaded as a single PDF file. The PDF upload must not be password protected or locked in any way. As a courtesy, the NSPIRES system performs a “check” of the proposal components upon submission. NSPIRES is used by multiple programs for proposal submission, and only the components outlined in this solicitation are required for compliance. Checks referring to proposal components not mentioned above, or requesting proposal components be uploaded separately (such as budget justification), can be ignored.

The following supersedes the information provided in the *Guidebook for Proposers*.

a) Mentor Support Statement

The Mentor must provide a statement that indicates how the Postdoctoral Fellow will be supported if the fellowship is granted and why the Postdoctoral Fellow would benefit from this opportunity.

b) Biographical Sketches

Biographical Sketches must be provided for the Postdoctoral Fellow and the Mentor. Biographical Sketches for each should not exceed two pages. An NIH-style Biographical Sketch format is acceptable. See Appendix C for more information.

c) Resource Facilities and Equipment

See Appendix C for more information.

d) Research Plan

The length of the Research Plan cannot exceed 12 pages using standard (12 point) type. Text should have the following margins: left = 1.5”; Right, top, bottom = 1.0”. Referenced figures must be included in the 12 pages of the project description; however, figure captions can use a 10 point font. The proposal should contain sufficient detail to enable reviewers to make informed judgments about the overall merit of the proposed research and about the probability that the Postdoctoral Fellow will be able to accomplish the stated objectives with current resources and the resources requested. The hypotheses and specific aims of the proposed research must be clearly stated. **Proposals that exceed the 12-page limit for the research plan will be declined without review.** Literature cited and other proposal sections are not considered part of the 12-

page project description, however, reviewers are not required to consider information presented as appendices or to view and/or consider web links in their evaluation of the proposal.

e) Bioastronautics Roadmap Form

Proposers must include a Table as part of their proposal mapping these risks and questions to hypotheses and research aims. This Table should follow the research plan as part of the main proposal upload. An example Table is shown in Appendix A, Section III of this RFA.

f) Special Matters (Specific information on animal or human subjects protocol approval required, if applicable)

NSBRI utilizes just-in-time practices for approval of the use of human subjects or animals. For proposals employing human subjects and/or animals, assurance of compliance with human subjects and/or animal care and use provisions is required within 90 days of notice of award. Please select “pending” or “approved” for the IRB/IACUC question on the Proposal Cover Page. If the IRB/IACUC certification is already approved at proposal submission, attach a copy of the certification as part of the proposal upload and select “approved”. Otherwise, select “pending”.

After award, a statement must be provided to NSBRI from the Applicant institution which identifies the selected proposal by name and which certifies that the proposed work will meet all Federal and local requirements for human subjects and/or animal care and use. This includes relevant documentation of Institutional Review Board (IRB) approval and/or approval by the Institutional Animal Care and Use Committee (IACUC).

Policies for the protection of human subjects in NASA-sponsored research are described in the NASA Policy Directive (NPD) 7100.8D “*Protection of Human Research Subjects:*”
http://nodis.hq.nasa.gov/displayDir.cfm?Internal_ID=N_PD_7100_008D_&page_name=main&search_term=7100%2E8D%20

Animal use and care requirements are described in the NASA Code of Federal Regulations (CFR) 1232 (*Care and Use of Animals in the Conduct of NASA Activities*):
<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=2184a825efdce39c35bde4673d5d8158&rgn=div5&view=text&node=14:5.0.1.1.22&idno=14>

Additional Requirements for Research Employing Human Subjects and/or Animals

With regard to research involving human subjects, NASA and the NSBRI have adopted the National Institutes of Health (NIH) policy. Women and members of minority groups and their subpopulations must be included in NASA-supported biomedical and behavioral research projects involving human subjects, unless a clear and compelling rationale and justification is provided showing that inclusion of these groups is inappropriate with respect to the health of the subjects or the purpose of the research.

The NSBRI will require current IRB or IACUC certification prior to each year’s award.

g) References and Citations

References cited are not considered part of the 12-page project description. However, reviewers are not required to consider information presented as appendices or to view and/or consider web links in their evaluation of the proposal.

h) Reprints and Appendices

Reprints and Appendices, if any, do not count toward the project description page limit and are to be included following all other sections of the proposal. **(Reviewers are not required to consider information presented in appendices.)**

C. Submission Dates

Solicitation Announcement Identifier: NSBRI-RFA-07-02

Notices of Intent Due: July 10, 2007, 5 p.m. Eastern Time

Proposals Due: August 1, 2007, 5 p.m. Eastern Time

Estimated Selection Announcement: Fall 2007

Selecting Official: Director, National Space Biomedical Research Institute

D. Letters of Reference

Three letters of reference for Postdoctoral Fellowship Applicants must be received at the address below within one week following the submission deadline. Postdoctoral Fellowship Applicants will be notified via email when each letter of reference is received by NSBRI. **Applications without all three required letters received within one week of the submission due date will be considered incomplete and may be returned without review.**

National Space Biomedical Research Institute
RE: Postdoctoral Fellowships Reference Letters
One Baylor Plaza, NA-425
Houston, TX 77030-3498
713-798-7412

VI. Review and Selection Process

Upon receipt, applications will be reviewed for compliance with the requirements of this Request for Applications. This includes the following:

1. Submission of complete applications as specified in this RFA. Proposals must be responsive to the areas of program element emphasis described in this NSBRI-RFA and include a research plan that is **not more than 12 pages in length.**
2. Submission of all other appropriate forms, letters, and institutional and Mentor electronic signatures as required by this NSBRI-RFA and NSPIRES.

Note: Non-compliant applications will be withdrawn from the review process and returned without further review.

Compliant applications submitted in response to this NSBRI-RFA will undergo an intrinsic scientific or technical merit review by a peer-review panel.

Criteria for Evaluation of Applications

Applications will be evaluated on the basis of three criteria: (i) scientific merit and program relevance of the proposal, (ii) research mentor and training environment, and (iii) research background and qualifications of the candidate. Final selections for funding of proposals will be made by the NSBRI Director. Applicants are encouraged to review detailed project summaries for current and completed NSBRI research projects at <http://www.nsbri.org>. The technical summaries appear in the “Research Areas” section.

Development of a Selection Recommendation

A selection recommendation will be developed based on the criteria as described above.

Deficiencies in any of the criteria factors may prevent selection of an application. The development of selection recommendations is the responsibility of the peer-review panel. Final selections for funding of proposals will be made by the NSBRI Director. Only grants will be awarded as a result of this NSBRI-RFA.

VII. Travel and Reporting Requirements

Travel Requirements

Each year, Postdoctoral Fellows selected in response to this NSBRI-RFA will be expected to attend the following meetings: a mandatory meeting of Postdoctoral Fellows at the annual NSBRI/NASA Investigators’ meeting in the Houston area, a research team meeting, and a domestic scientific meeting of the Postdoctoral Fellow’s choice. During the first summer of the fellowship, the Postdoctoral Fellow will also be expected to spend 3-5 days in Houston and at the NASA Johnson Space Center. The Johnson Space Center visit will be arranged by the Fellowship Program. Funding, as available, will be provided to cover the costs associated with these meetings.

Publication in Peer-Reviewed Journals

It is expected that results from funded research will be published in peer-reviewed journals as the work is completed. **Published papers must acknowledge NSBRI support.**

Annual Report

The NSBRI uses Annual Reports to assess progress relative to stated research objectives and hypotheses as declared in the original grant proposal by the Postdoctoral Fellow. It is imperative that the reports indicate how the investigation relates to BR research and technology questions.

An Annual Report is due to the NSBRI 30 days before the end of the first year of funding to communicate the status of the completed research and to identify peer-reviewed publications to date. A format outlining the report requirements will be provided. Submission of the first year annual report is required before the funding for the second year will be issued.

Final Report

A Final Report is required that addresses the entire scope of the project and is linked to BR risks

and research and technology questions. The report also includes peer-reviewed publications and intellectual property disclosures resulting from the NSBRI-supported work. This report must be submitted to the NSBRI within 60 days after the end of the Fellowship.

Formative Assessment

NSBRI will be actively engaged in the ongoing assessment of the Postdoctoral Fellowship Program to assure that the program has been implemented as planned and to make recommendations for enhancement. Formative assessments will include, but are not limited to, interviews with Postdoctoral Fellows and Mentors.

Follow-up

To assess the impact of Postdoctoral Fellowships on the career advancement of young scientists and to provide an active network of investigators in space biomedical research and development, the NSBRI will request brief, periodic updates on the status of NSBRI Postdoctoral Fellows throughout their careers. These updates will be facilitated by the NSBRI Postdoctoral Fellowship Project Coordinator and include interviews with participants.

INSTRUCTIONS FOR RESPONDING TO NSBRI REQUESTS FOR APPLICATIONS

(a) General.

(1) Proposals received in response to an NSBRI Request for Applications (NSBRI-RFA) will be used only for evaluation purposes. The NSBRI does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NSBRI-RFA, to be used as the basis of a solicitation or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.

(2) A solicited proposal that results in an NSBRI award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that the NSBRI and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

(3) NSBRI-RFAs contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NSBRI-RFAs.

(4) A cooperative subagreement will be used to accomplish an effort funded in response to an NSBRI-RFA. The NSBRI will coordinate the implementation of the award instrument. Contracts resulting from NSBRI-RFAs are subject to the Federal Acquisition Regulation (FAR) and the NASA FAR Supplement. Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1).

(5) The NSBRI has a mandatory format for responses to NSBRI-RFAs. All applications must be submitted utilizing the NSPIRES System. For further information, please see Appendix B, Section III.

(6) To be considered for award, a submission must, at a minimum, present a specific project within the areas delineated by the NSBRI-RFA; contain sufficient technical information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA or NSBRI solicitation.

(b) NSBRI-RFA-Specific Items. Several proposal submission items appear in the NSBRI-RFA itself: the unique NSBRI-RFA identifier; dates for proposal deadlines;

instructions for submission of proposals; electronic submission format; and sources for more information. Items included in these instructions may be supplemented by the NSBRI-RFA.

(c) The following information is needed to permit consideration in an objective manner. NSBRI-RFAs will generally specify topics for which additional information or greater detail is desirable.

(1) Proposal Cover Page

- (i) The legal name of the organization and specific division or campus identification if part of a larger organization;
- (ii) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;
- (iii) Type of organization: e.g., profit, nonprofit, small business, woman-owned, socially and economically disadvantaged, etc.;
- (iv) Name and telephone number of the Mentor (PI) and business personnel who may be contacted during evaluation or negotiation;
- (v) Identification of the NSBRI-RFA, by number and title, to which the proposer is responding;
- (vi) Desired starting date, and duration of project;
- (vii) Date of submission;
- (viii) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization (unless the signature appears on the proposal itself); and
- (ix) Signature of a Mentor for Postdoctoral Fellowship Applications.

(2) Restriction on Use and Disclosure of Proposal Information. Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following notice at the beginning of the Research Plan (which is in addition to the specified page limits) and specify the information subject to the notice by inserting an appropriate identification in the notice. In any event, information contained in proposals will be protected to the extent permitted by law, but the NSBRI assumes no liability for use and disclosure of information not made subject to the notice.

Notice

Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged (“Information”). It is furnished to the NSBRI in confidence with the understanding that it will not, without permission of the Offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this Information to the extent provided in the contract (or other agreement). This restriction does not limit the Government’s right to use or disclose this Information if obtained from

another source without restriction. The obligations in this Section shall not apply with respect to any Information which:

- (a) is disclosed in a printed publication available to the public, is described in a patent anywhere in the world, is otherwise in the public domain at the time of disclosure, or becomes publicly known through no wrongful act on the part of NSBRI;
- (b) is known to NSBRI or becomes known to NSBRI through disclosure by sources other than the Offeror having the right to disclose such Information;
- (c) is disclosed pursuant to the requirement of a governmental agency or any law requiring disclosure thereof;
- (d) is generally disclosed to third parties by the Offeror without similar restriction on such third parties; or
- (e) is approved for release by written authorization of the Offeror.

(3) Abstract. Include a concise 4,000 character abstract describing the objective and the method of approach.

(4) Project Description. The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance; relation to the present state of knowledge; and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NSBRI-RFA. Any substantial collaboration with individuals other than the Mentor, or use of consultants, should be described. Subcontracting significant portions of a research project is discouraged.

(5) Personnel. The Mentor is responsible for supervision of the work. A short biographical sketch of the Postdoctoral Fellow and the Mentor, a list of principal publications and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal.

(6) Facilities and Equipment. Describe available facilities and major items of equipment relevant to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tools that are proposed for use. Include evidence of its availability and the cognizant Government points of contact.

(7) Security. Proposals should not contain security classified material. If the research requires access to, or may generate, security classified information, the submitter will be required to comply with Government security regulations.

(8) Current Support. For other current projects being conducted by the Postdoctoral Fellow and Mentor, provide title of project, sponsoring agency, percent effort, and project starting and ending dates.

(9) Special Matters. Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(10) Length. Unless otherwise specified in the NSBRI-RFA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Proposals may not exceed 12 pages. Necessary detailed information, such as reprints, should be included as attachments.

(11) Withdrawal. Applications may be withdrawn at any time before award. Offerors are requested to notify the NSBRI if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

(12) Selection for Award.

(12.1) When an application is not selected for award, the Applicant will be notified. The NSBRI will explain generally why the application was not selected. Applicants desiring additional information may contact the selecting official who will arrange a debriefing.

(12.2) When an application is selected for award, negotiation and award will be handled by the NSBRI in the funding installation. The application is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

(13) Cancellation of NSBRI-RFA. The NSBRI reserves the right to make no awards under this NSBRI-RFA and to cancel this NSBRI-RFA. The NSBRI assumes no liability for canceling the NSBRI-RFA or for anyone's failure to receive actual notice of cancellation.

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER
RESPONSIBILITY MATTERS**

PRIMARY COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 14 CFR Part 1269.

A. The Applicant certifies that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not, within a three-year period preceding this application/application proposal, been convicted or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or Local) with commission of any of the offenses enumerated in paragraph A.(b) of this certification; and
- (d) Have not, within a three-year period preceding this application/proposal, had one or more public transactions (Federal, State, or Local) terminated for cause or default; and

B. Where the Applicant is unable to certify to any of the statements in this certification, he or she shall attach an explanation to this application.

C. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lowered Tier Covered Transactions (Subgrants or Subcontracts)

- a) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- b) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

CERTIFICATION REGARDING LOBBYING

As required by S 1352 Title 31 of the U.S. Code for persons entering into a grant or cooperative agreement over \$100,000, the Applicant certifies that:

- (a) No Federal appropriated funds have been paid or will be paid, by or on behalf of, the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, in connection with making of any Federal grant, the entering into of any cooperative, and the extension, continuation, renewal, amendment, or modification of any Federal grant or cooperative agreement;
- (b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting an officer or employee of any agency, Member of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (c) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subgrants, contracts under grants and cooperative agreements, and subcontracts), and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by S1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**CERTIFICATION OF COMPLIANCE WITH THE NASA REGULATIONS
PURSUANT TO
NONDISCRIMINATION IN FEDERALLY ASSISTED PROGRAMS**

The (institution, corporation, firm, or other organization on whose behalf this assurance is signed, hereinafter called "Applicant") hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352), Title IX of the Education Amendments of 1962 (20 U.S. 1680 et seq.), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S. 794), and the Age Discrimination Act of 1975 (42 U.S. 16101 et seq.), and all requirements imposed by or pursuant to the Regulation of the National Aeronautics and Space Administration (14 CFR Part 1250) (hereinafter called "NASA") issued pursuant to these laws, to the end that in accordance with these laws and regulations, no person in the United States shall, on the basis of race, color, national origin, sex, handicapped condition, or age be excluded from participating in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant receives federal financial assistance from NASA; and hereby give assurance that it will immediately take any measure necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of federal financial assistance extended to the Applicant by NASA, this assurance shall obligate the Applicant, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant for the period during which the federal financial assistance is extended to it by NASA.

This assurance is given in consideration of and for the purpose of obtaining any and all federal grants, loans, contracts, property, discounts, or other federal financial assistance extended after the date hereof to the Applicant by NASA, including installment payments after such date on account of applications for federal financial assistance which were approved before such date. The Applicant recognizes and agrees that such federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign on behalf of the Applicant.