

# Protein Data Bank Management (PDB Mgmt)

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## Program Solicitation

NSF 08-507

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### National Science Foundation

Directorate for Biological Sciences



### National Institutes of Health

National Institute of General Medical Sciences

National Library of Medicine

National Cancer Institute

National Institute of Neurological Disorders and Stroke

National Institute of Diabetes and Digestive and Kidney Diseases



### U.S. Dept. of Energy

Office of Biological and Environmental Research

**Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

January 16, 2008

**Full Proposal Target Date(s):**

March 19, 2008

## REVISION NOTES

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In furtherance of the President's Management Agenda, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

In response to this program solicitation, proposers may opt to submit proposals via [Grants.gov](http://Grants.gov) or via the [NSF FastLane](#) system.

Eligible organizations are as described in the text below. Although the PDB is expected to be multi-organizational, a single organization must serve as the lead with all other organizations as subawardees. Proposals to this program may not be submitted as collaboratives.

## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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**Program Title:**

Protein Data Bank Management (PDB Mgmt)

**Synopsis of Program:**

The goal of this solicitation is to ensure the continuing, highest possible quality of management for the central, U.S. component of the Protein Data Bank (PDB). The Protein Data Bank has achieved global recognition as the sole, authoritative repository for macromolecular structure information. To secure the continued success of this international resource, the U.S. supporting agencies are committed to ensuring that the management of the U.S. component is of the highest quality, providing a reliable, capable, and effective partner for its counterparts overseas. This competition for PDB management is designed to fulfill that commitment.

Proposals submitted in response to this solicitation must describe a plan for PDB management that is forward-looking and provides an effective framework for anticipating and responding to rapidly changing technologies and to the constantly changing needs, expectations, and composition of the user community. Proposers should: present a compelling rationale and vision for the management organization including its vision for the future of PDB; describe a strategy for collaborating with other national and international partners, resource providers, and community groups; address the full data life cycle management needs and requirements; describe mechanisms to ensure that PDB will be a community resource for research, education, and training; and describe a plan for leadership, administration, and community input and oversight that ensures that the management organization will be responsive to the community and successful in achieving its vision for the Protein Data Bank.

**Cognizant Program Officer(s):**

- Peter H. McCartney, telephone: (703) 292-8470, email: [biopdb@nsf.gov](mailto:biopdb@nsf.gov)
- John Norvell, National Institute of General Medical Sciences, telephone: (301) 594-0533, email: [norvellj@nigms.nih.gov](mailto:norvellj@nigms.nih.gov)
- Valerie Florance, National Library of Medicine, telephone: (301) 594-4882, email: [florancev@mail.nlm.nih.gov](mailto:florancev@mail.nlm.nih.gov)
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- Salvatore Sechi, National Institute of Diabetes and Digestive and Kidney Diseases, telephone: (301) 594-8814, email: [SechiS@extra.niddk.nih.gov](mailto:SechiS@extra.niddk.nih.gov)

**Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):**

- 47.074 --- Biological Sciences
- 81.049 --- Office of Biological and Environmental Research
- 93.396 --- National Cancer Institute
- 93.847 --- National Institute of Diabetes and Digestive and Kidney Diseases
- 93.853 --- National Institute of Neurological Disorders and Stroke
- 93.859 --- National Institute of General Medical Sciences
- 93.879 --- National Library of Medicine

**Award Information**

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**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** 1 One award in Fiscal Year 2009 is anticipated

**Anticipated Funding Amount:** \$31,500,000 - One award of up to \$31,500,000 total costs (direct plus indirect) for 5 years is anticipated, pending the availability of funds. The supporting agencies, at their discretion, may choose to provide the

opportunity for one-time renewal for an additional 5 years subject to performance and pending the availability of funds.

## Eligibility Information

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### Organization Limit:

Proposals may only be submitted by the following:

- Academic institutions located and accredited in the U.S., U.S. non-profit research organizations that are directly associated with educational or research activities, and consortia of such organizations with appropriate research and educational facilities are eligible to submit proposals in response to this solicitation. When a consortium of organizations submits a proposal, it must be submitted as a single proposal with one organization serving as the lead and all other organizations as subawardees.

### PI Limit:

None Specified

### Limit on Number of Proposals per Organization:

None Specified

### Limit on Number of Proposals per PI:

None Specified

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf>)

### B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Not Applicable

### C. Due Dates

- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

January 16, 2008

• **Full Proposal Target Date(s):**

March 19, 2008

## Proposal Review Information Criteria

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**Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

## Award Administration Information

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**Award Conditions:** Standard NSF award conditions apply.

**Reporting Requirements:** Standard NSF reporting requirements apply.

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## I. INTRODUCTION

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Information regarding the three dimensional structure of macromolecules enables research progress in a far-reaching spectrum of fields including biophysics and biochemistry, molecular and cellular biology and metabolism, differentiation and development, disease processes, drug development and design, antiviral agents, cancer, neuroscience, bioprocess engineering and biotechnology, bioremediation, biofuels development, nanotechnology, biomimetic engineering, chemistry, materials science, and a host of others. Recognizing the value to science and society of preserving and providing for the broadest possible access to this information, the National Science Foundation, the Department of Energy, the National Institute of General Medical Sciences, the National Library of Medicine, the National Cancer Institute, the National Institute of

Neurological Disorders and Stroke, and the National Institute of Diabetes and Digestive and Kidney Diseases work together to provide support for the Protein Data Bank (PDB).

The rate at which new structural information is being gathered is continuously increasing with improvements in the underlying methods, development of new strategies and approaches, and increased investments by all sectors of society, including the Federal government through research and infrastructure support and focused programs such as the Protein Structure Initiative, and others. This rapidly growing body of structural information represents a significant opportunity for research progress. Capitalizing on this opportunity requires that this information be available in a reliable, authoritative, and accessible form. This is the mission of the Protein Data Bank. This solicitation is intended to ensure that PDB will continue to be the premier, authoritative, international resource for macromolecular structure information by ensuring the continuing, highest possible quality of management for the central, U.S. component.

The Protein Data Bank has achieved global recognition as the sole, authoritative repository for macromolecular structure information. The PDB is an international undertaking with the U.S. sites working closely with partners in Japan and the United Kingdom through the World Wide Protein Data Bank (wwPDB; see [www.pdb.org](http://www.pdb.org)). To secure the continued success of this international resource, the U.S. supporting agencies are committed to ensuring that the management of the U.S. component is of the highest quality, providing a reliable, capable, and effective partner for its counterparts overseas.

## II. PROGRAM DESCRIPTION

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The goal of this solicitation is to ensure the continuing, highest possible quality of management for the central, U.S. component of the Protein Data Bank. This goal is being pursued through this open competition for support for PDB management responsibilities. The Protein Data Bank is a valuable resource with proven potential to enable progress in research and education across a wide spectrum of science, engineering, and medicine. This competition for management is intended to enable the PDB to live up to its full potential.

Proposers must address all of the following responsibilities for PDB management in responding to this solicitation. In addressing these responsibilities, proposers should not view the management goal as simply maintaining current functionality and instead should view the goal as continually anticipating and responding to rapidly changing technologies and to the constantly changing needs, expectations, and composition of the user community.

### 1. Rationale and vision

- a. Describe the rationale and vision of the proposed management organization for PDB.
- b. Provide a mission statement for the management organization.
- c. Provide an overview of the scope of activities of the management organization.
- d. Provide an outline of the logical and conceptual structure of the proposed PDB information resource and a general outline of its physical implementation, including the role of the key, participating institutions (details of the cyberinfrastructure plan and management plan should be provided in appendices as described in Section V).
- e. Provide an overview of the roles of structural biologists, computer and information scientists, social scientists, educators, and others in the proposed management organization.

### 2. Partners and collaborators

- a. The PDB is a global resource and, as such, is part of a network of resource providers, collaborators (both national and international), and community groups.
  - i. Describe proposed collaborations/interactions with other resource providers to enhance the value of PDB information, for example by providing reciprocal links and searching capabilities between PDB and other relevant resources.
  - ii. Describe proposed collaborations with other partners, within and outside the U.S., to provide for PDB operations. Note that award funds may be used to support U.S. investigators and students to work in international settings and foreign investigators and students to work in the U.S. However, foreign collaborators must secure support for their activities at their own institutions or at other non-U.S. locations from their own national sources.

iii. Describe proposed relationships and interactions with community groups, professional societies, etc.

### 3. Data/Information life cycle management

#### a. Data/Information Acquisition and Documentation

- i. Describe proposed submission mechanisms including provisions for ensuring appropriate data and metadata content and formats. Describe criteria and mechanisms for ensuring completeness and accuracy.
- ii. Describe proposed annotation procedures and how these may provide appropriate contextual information, facilitate search and integration capabilities, and provide for quality control and validation. Describe the skills necessary for annotation and plans to provide a project workforce with those skills.

#### b. Data/Information Maintenance

- i. Describe provisions for backup (on and off-site), fail-over in the event a primary site goes down, and disaster recovery.
- ii. Describe plans and strategies for forward migration (including software and hardware refresh cycles) that accommodates new technologies, advanced information science concepts, and expanding user needs and expectations, without risking reliable data preservation and access.
- iii. Describe provisions for systems security and protection, and data quality control, validation, assurance, and history/provenance retention.

#### c. Data/Information Dissemination

- i. Describe proposed user interfaces for both human and machine access.
- ii. Describe the expected user community and how access for the full community will be provided. Describe whether and how the user community is expected to grow and how such growth will be accommodated.
- iii. Describe the capabilities to be provided for discovering, visualizing, understanding, and analyzing data/information (details of the hardware and software resources and tools to be provided to achieve these capabilities should be described in the cyberinfrastructure appendix; see proposal preparation instructions below).

#### d. Data/Information Disposition

- i. Describe how decisions will be made about what to keep over what period of time, and indicate who will make such decisions.
- ii. Describe a termination plan to be used in the event that the proposed management team ends its participation for any reason (including as the result of decisions by either the management team or the supporting agencies).

### 4. Preparing for the future

- a. Describe the vision of the management team for the future of PDB. Outline strategies for achieving that vision, including strategies that scale to meet anticipated increases in deposition rates and complexity, and user volume, diversity, and needs.
- b. Describe strategies and mechanisms to be used in adapting to new methods for structure determination, evaluation, and comparison.
- c. Although this is an infrastructure award, it is recognized that a limited (i.e., <5% of total project budget) research and development activity is needed to anticipate new technologies, strategies, and concepts and to plan for their implementation. Describe the organization and goals of the research and development component, if one is planned. Describe the skills necessary for such research and development activities and plans to provide a project workforce with those skills.

### 5. Outreach and Education

- a. Community resource: The PDB must be managed as a resource by, for, and of the community.
  - i. Define the expected communities of depositors, users, and others and explain how their needs and

expectations will be met and how they will participate. The inclusion of scientists, educators, and students who are not themselves practicing structural biologists in this community of expected users is required.

- ii. Outline mechanisms for community input in planning and implementation (details of advisory boards and committees should be described in the management plan appendix; see proposal preparation instructions below).
  - iii. Describe mechanisms for obtaining depositor/user feedback for evaluation and assessment, and for responding to that input.
- b. Education and training: The Protein Data Bank provides resources and capabilities that can be used to create new educational opportunities, provide for a capable workforce for the future, promote the integration of research and education, and enhance the appreciation for and understanding of science by the general public
- i. Describe the education, training, and public outreach goals for PDB and how these will be pursued.
  - ii. Describe strategies to be used for promoting the integration of research and education.
  - iii. Describe the assessment methods to be used to evaluate the effectiveness and impact of the education and training activities.

#### 6. Leadership and Management Plan

Strong central leadership is critical to the success of the management organization both for maintaining a clear vision and for balancing activities across the full range of PDB responsibilities. For these reasons, proposals involving multiple organizations must be received as a single submission with one organization acting as the lead and all others as subawardees.

- a. The director of the management team should have a broad vision, good familiarity with the appropriate range of science and technology, and the ability to lead and integrate diverse teams of project participants. The director must be a recognized leader in research and education with proven managerial skills from prior experience leading and managing large project teams to achieve shared goals. Proposals should either identify an individual designated as director or describe a recruitment and selection process to obtain a qualified individual who will fulfill these expectations.
- b. A characteristic feature of PDB management is the need to pursue a wide range of activities simultaneously. This requires an effective management plan with clear lines of responsibility.
- c. The Protein Data Bank must be a resource that is by, for, and of the broad range of research, education, training, and other communities it serves. This requires a comprehensive and responsive plan for community input and oversight, including mechanisms for: actively reaching out and interacting with the community; obtaining input and feedback from users and potential users; and obtaining advice and providing for oversight from fully representative external advisory boards.

### III. AWARD INFORMATION

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One award of up to \$31,500,000 total costs (direct plus indirect) for up to 5 years is anticipated, pending the availability of funds. The initial term of the award is expected to be up to 5 years. The supporting agencies, at their discretion, may choose to provide the opportunity for one-time renewal for an additional 5 years subject to performance and pending the availability of funds.

### IV. ELIGIBILITY INFORMATION

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#### Organization Limit:

Proposals may only be submitted by the following:

- Academic institutions located and accredited in the U.S., U.S. non-profit research organizations that

are directly associated with educational or research activities, and consortia of such organizations with appropriate research and educational facilities are eligible to submit proposals in response to this solicitation. When a consortium of organizations submits a proposal, it must be submitted as a single proposal with one organization serving as the lead and all other organizations as subawardees.

**PI Limit:**

None Specified

**Limit on Number of Proposals per Organization:**

None Specified

**Limit on Number of Proposals per PI:**

None Specified

**Additional Eligibility Info:**

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## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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### A. Proposal Preparation Instructions

**Letters of Intent(required):**

Letters of Intent (LOI) are required and must be submitted via Fastlane. Letters will be used by the program to guide the selection of reviewers and must include the following information:

- Name and affiliation of Principal Investigator
- Name(s) and affiliation(s) of Co-Principal Investigator(s)
- Name(s) and affiliation(s) of Senior Personnel
- Name(s) of other participating organizations
- Brief description (250 words or less) of the proposed management project describing intellectual merit and broader impacts and outlining the roles of each of the participating organizations

See the Proposal and Award Preparation Guide ([NSF 07-140](#)) for the definition of Senior personnel.

Note: For purposes of brevity, Letter of Intent Preparation Instructions limit the number of Senior Project Personnel and Participating Organizations that can be included in the LOI only. There are no such limitations in the Full Proposal.

**Letter of Intent Preparation Instructions:**

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- A Minimum of 0 and Maximum of 4 Other Senior Project Personnel are allowed
- A Minimum of 0 and Maximum of 4 Other Participating Organizations are allowed
- Submission of multiple Letters of Intent is not allowed

**Full Proposal Preparation Instructions:** Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Paper copies of the GPG may be obtained from the NSF Publications



Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov). Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (<http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf>). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

Eligible organizations are as described in Section IV. Although the PDB is expected to be multi-organizational, a single organization must serve as the lead with all other organizations as subawardees. Proposals to this program may not be submitted as collaboratives.

The following exceptions and additions apply to proposals submitted to this Program:

#### **Cover Sheet:**

- **FastLane Users:** Select this program solicitation number from the pull down list. Entries on the FastLane Cover Sheet are limited to the principal investigator/project director (PI) and a maximum of 4 co-principal investigators/project directors (co-PIs). Additional members of the leadership team should be listed on the Project Summary page and entered into FastLane as Senior Investigators (this latter provision allows their biographical sketches to be included in the FastLane proposal). For more FastLane instructions see section D below.
- **Grants.Gov Users:** The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. NSF allows one principal investigator/project director (PI) and a maximum of 4 co-principal investigators/project directors (co-PIs) to be identified on a proposal. Instructions for adding additional senior project participants are provided in Section V.5 of the NSF Grants.gov Application Guide.

**Title:** The title of the proposal must begin with "PDB Management:"

**Project Summary (1 page):** The summary must consist of three parts: (1) At the top of the page, a list providing the title of the project, the name of the PI and the lead organization, and the names of co-PIs and other senior project personnel along with their organizational affiliations; (2) a succinct summary of the intellectual merit of the proposed management strategy, including rationale and vision, partners and collaborators, data life cycle management, preparing for the future, and project leadership and management; and (3) a description of the broader impacts of the proposed activities including plans to improve access, reliability, and usability of PDB information, increase diversity of participation and access, and enhance outreach and educational activities. Proposals that do not separately address both intellectual merit and broader impacts will be returned without review.

**Project Description (maximum 25 pages):** The following exceptions and additions to the Project Description requirements of the GPG or NSF Grants.gov Application Guide apply to this program:

- **Results from Prior Support** – Describe prior research and management activities of the PI and co-PIs that are directly relevant to this management proposal.
- **Intellectual merit and broader impacts** – Provide specific plans to address each of the following categories of responsibilities listed below and detailed above in Section II (Program Description) of this solicitation.
  - Rationale and vision
  - Partners and collaborators
  - Data life cycle management
  - Preparing for the future
  - Education and outreach
  - Project leadership and management (details of the management plan should be provided in appendix A2 of the Supplementary Documentation section as described below)

**References Cited** – Indicate with an asterisk any cited publications from prior research funded by any of the supporting agencies (listed on the cover page of this solicitation) for the PI or co-PIs when following the guidelines for all references cited.

**Biographical Sketches** – Provide biographical sketches for the PI, co-PIs and Senior Personnel listed on the Project Summary page.

**Current and Pending Support** – Provide this information for the PI, co-PIs and Senior Personnel listed on the Project Summary page. Address any potential overlap between the federally funded projects that are listed and the proposed management activities.

**Budget** – Follow the instructions in the GPG or NSF Grants.gov Application Guide for preparing the budget. Multi-institutional proposals must be submitted through the lead organization with a single budget including all other participating organizations as subawardees (see GPG guidelines, Chapter II.D.3). Proposals in response to this solicitation may not be submitted as collaboratives. Provide a detailed budget justification separately for the lead organization (up to three pages) and for each subawardee budget (up to three pages each).

Funds for facility construction or renovation may not be requested. Funds from this program may not be used to support independent, individual research projects of the participants.

**Special Information and Supplementary Documentation:** In addition to the applicable items described in the GPG, include the following appendix information, clearly labeled, as Supplementary Documentation. **(No other appendix material will be allowed.):**

- Appendix A1, Key Personnel (maximum 3 pages): Provide a list of the key leadership personnel with a brief description of what each person brings uniquely to the management organization.
- Appendix A2, Management Plan (maximum 4 pages): Provide a detailed management plan describing key leadership positions, reporting relationships, means of communication and interaction among members of the team and with the community, oversight and accountability mechanisms, external advisory committees, etc. Do not list individual names of the advisory committee, but list the number of members, describe the range of expertise and diversity needed to constitute an effective committee, and describe procedures for selection of committee members.
- Appendix A3, Cyberinfrastructure plan (maximum 5 pages): Describe the hardware and software systems and technologies to be used, the computation, networking and access capabilities, and capacity to be provided, user help services, and the provisions for reliable preservation, fail-over capability, and disaster recovery. Describe initial goals and procedures for setting future goals for system response time, capacities for access, analysis and downloads, and system down-time (planned and unplanned).
- Appendix A4, Data and software sharing policies (maximum 3 pages): List the categories of data and software to be made available for sharing. Provide a clear statement of management of intellectual property rights and how the management organization plans to share information, data, tools, and resources that result from the activities supported under this award and that result from activities regardless of the source of support. Describe policies for open source software. Describe how tools and resources will be made accessible and usable by the broader community.
- Appendix A5, Project plan (maximum 5 pages): Provide a detailed plan, including tasks, primary responsibilities, deliverables, milestones, and timeline with completion dates for the startup phase (if appropriate) and first year project activities. Provide an outline plan for project years 2-5. Identify risks to the project plan and describe plans for managing those risks.

**Single Copy Documents** – The following information is required in addition to that covered by the provisions of the GPG or the NSF Grants.gov Application Guide:

- Conflicts of Interest list: Provide a list, in a single alphabetized table, with the full names of all people with conflicts of interest for the PI, co-PIs and Senior Personnel listed on the project summary page. Conflicts to be identified are (1) Ph.D. thesis advisors or advisees, (2) collaborators or co-authors, including post-docs, for the past 48 months, and (3) any other individuals or organizations with which the investigator has financial ties (please specify the type of conflict for each listing in the table).

## B. Budgetary Information

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**Cost Sharing:** Cost sharing is not required under this solicitation.

## C. Due Dates

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- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

January 16, 2008

- **Full Proposal Target Date(s):**

March 19, 2008

#### **D. FastLane/Grants.gov Requirements**

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- **For Proposals Submitted Via FastLane:**

Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

**Submission of Electronically Signed Cover Sheets.** The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

- **For Proposals Submitted Via Grants.gov:**

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: <http://www.grants.gov/CustomerSupport>. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: [support@grants.gov](mailto:support@grants.gov). The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

**Submitting the Proposal:** Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

#### **VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES**

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Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

##### **A. NSF Merit Review Criteria**

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All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These

considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

#### **What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

#### **What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

NSF staff also will give careful consideration to the following in making funding decisions:

#### ***Integration of Research and Education***

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

#### ***Integrating Diversity into NSF Programs, Projects, and Activities***

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

#### **Additional Review Criteria:**

- How will the vision and rationale described in the proposal contribute to the goal of ensuring the highest possible quality of management for the Protein Data Bank?
- Does the proposal describe a plan for partnering and collaboration that will ensure the Protein Data Bank serves as a global resource operating effectively within a network of other resource providers to provide maximum benefit to a broad range of users and communities?
- How effective are the plans for management of all aspects of the data life cycle?
- How effective will the strategy proposed for preparing for the future be in ensuring that the Protein Data Bank remains a premier information resource at the leading edge of technology and innovation?
- How effective will the proposed outreach and education plans be in increasing the breadth of participation and access for Protein Data Bank at all levels, ensuring a capable workforce for the future and enhancing public appreciation for and understanding of science?
- How effective will the management plan be in providing leadership and accountability for Protein Data Bank, close communication and interaction with the relevant community(ies) and stakeholders, and the flexibility to respond to changes in technologies and in the needs of the relevant community(ies)?

## **B. Review and Selection Process**

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Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review, or Site Visit Review.

Proposals will first be evaluated by both external mail-in and panel review. The results of this evaluation will then be used by the program to select proposals for a site visit review by an external evaluation panel.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

### B. Award Conditions

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An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); \* or Federal Demonstration Partnership (FDP) Terms and Conditions \* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

\*These documents may be accessed electronically on NSF's Website at [http://www.nsf.gov/awards/managing/general\\_conditions.jsp?org=NSF](http://www.nsf.gov/awards/managing/general_conditions.jsp?org=NSF). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=aag](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag).

### C. Reporting Requirements

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For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational) publications; and, other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

## VIII. AGENCY CONTACTS

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General inquiries regarding this program should be made to:

- Peter H. McCartney, telephone: (703) 292-8470, email: [biopdb@nsf.gov](mailto:biopdb@nsf.gov)
- John Norvell, National Institute of General Medical Sciences, telephone: (301) 594-0533, email: [norvellj@nigms.nih.gov](mailto:norvellj@nigms.nih.gov)
- Valerie Florance, National Library of Medicine, telephone: (301) 594-4882, email: [florancev@mail.nlm.nih.gov](mailto:florancev@mail.nlm.nih.gov)
- Dan Gallahan, National Cancer Institute, telephone: (301) 435-5226, email: [gallahad@mail.nih.gov](mailto:gallahad@mail.nih.gov)
- Randall Stewart, National Institute of Neurological Disorders and Stroke, telephone: (301) 496-1917, email: [stewartr@ninds.nih.gov](mailto:stewartr@ninds.nih.gov)
- Salvatore Sechi, National Institute of Diabetes and Digestive and Kidney Diseases, telephone: (301) 594-8814, email: [SechiS@extra.niddk.nih.gov](mailto:SechiS@extra.niddk.nih.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).
- Lauren Kitchen, BIO/DBI, telephone: (703) 292-8470, fax: (703) 292-9063, email: [BIOPDB@nsf.gov](mailto:BIOPDB@nsf.gov)

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: [support@grants.gov](mailto:support@grants.gov).

Investigators are encouraged to contact the program with questions about appropriateness for this solicitation before submitting a proposal.

## IX. OTHER INFORMATION

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The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, MyNSF (formerly the Custom News Service) is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at <http://www.nsf.gov/mynsf/>.



Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

*Facilitation Awards for Scientists and Engineers with Disabilities* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
  
- **For General Information** (NSF Information Center): (703) 292-5111
  
- **TDD (for the hearing-impaired):** (703) 292-5090
  
- **To Order Publications or Forms:**
  - Send an e-mail to: [pubs@nsf.gov](mailto:pubs@nsf.gov)
  - or telephone: (703) 292-7827
  
- **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton  
Reports Clearance Officer  
Division of Administrative Services  
National Science Foundation  
Arlington, VA 22230

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