

Program Solicitation

08-563

Replaces Document(s):

NSF 05-577



National Science Foundation

Directorate for Biological Sciences

Full Proposal Target Date(s):

August 12, 2008

Second Tuesday in August, Annually Thereafter

August 11, 2009

August 10, 2010

REVISION NOTES

This Program Solicitation replaces [NSF 05-577](#). Significant changes in this solicitation include:

- changing the program title from “Biological Databases and Informatics” to “Advances in Biological Informatics”;
- increasing emphasis on informatics proposals and decreased emphasis on database creation;
- adding language that stresses the need for a biological emphasis in the proposals;
- emphasis on transformative research proposals;
- updating the list of suggested topics;
- removing the limit on number of proposals from a single investigator;
- including request for workshop proposals;
- the acceptance of collaborative proposals; and
- requiring development, management, and sustainability plans in the project description.

Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

As announced on May 21, 2009, proposers must prepare and submit proposals to the National Science Foundation (NSF) using the NSF FastLane system at <http://www.fastlane.nsf.gov/>. This approach is being taken to support efficient Grants.gov operations during this busy workload period and in response to OMB direction guidance issued March 9, 2009. NSF will continue to post information about available funding opportunities to Grants.gov FIND and will continue to collaborate with institutions who have invested in system-to-system submission functionality as their preferred proposal submission method. NSF remains committed to the long-standing goal of streamlined grants processing and plans to provide a web services interface for those institutions that want to use their existing grants management systems to directly submit proposals to NSF.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Synopsis of Program:

The Advances in Biological Informatics (ABI) program seeks to encourage new approaches to the analysis and dissemination of biological knowledge for the benefit of both the scientific community and the broader public. The ABI program is especially interested in the development of informatics tools and resources that have the potential to advance, or transform, research in biology supported by the Directorate for Biological Sciences at the National Science Foundation.

Cognizant Program Officer(s):

- Peter McCartney, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, 615 N, telephone: (703) 292-8470, email: dbiabi@nsf.gov
- P. Bryan Heidorn, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, 615 N, telephone: (703) 292-8470, email: dbiabi@nsf.gov
- Lita M Proctor, telephone: (703) 292-8470, email: dbiabi@nsf.gov

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

- 47.074 --- Biological Sciences

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 20 to 25

Anticipated Funding Amount: \$20,000,000 Total estimated funding is approximately \$20 million annually, subject to the availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Organizations ineligible under this solicitation to submit proposals (federal government laboratories, federally funded research and development centers, for-profit organizations, and state and local governments) may not receive subawards from this program. Investigators who are employed at ineligible organizations may participate as collaborators but their research support must be provided from non-NSF sources. Those investigators who hold a joint appointment with an eligible organization may participate through that affiliation except that they may not receive salary from the NSF funds. International collaboration is encouraged; however, financial support for any non-U.S. participant organization must be provided from within the participant's country or other non-NSF sources.

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

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information

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

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

August 12, 2008

Second Tuesday in August, Annually Thereafter

August 11, 2009

August 10, 2010

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria apply.

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

Biological processes at all scales from molecules to ecosystems are mediated through the encoding, exchange, and interpretation of information. Advances in the biological sciences are enabled by our capacity to recognize, manage, represent, and analyze the structure in biological data through the use of modern digital media and computational tools. Developing an integrated understanding of cell function, regulatory systems, or ecological responses to environmental change are just a few examples of biological research areas that involve large amounts of data generated through observation, experiment, and modeling.

The Directorate for Biological Sciences (BIO), through the Division of Biological Infrastructure (DBI), supports the design, development, implementation, and use of information resources and tools for which a need has been identified by the biology community. All fields of science supported by BIO are eligible for support under the ABI program. The ABI program seeks to encourage new approaches to the deployment of biological knowledge that renders the data and information therein of greater value to the scientific community. The ABI program is especially interested in proposals that offer potentially transformative outcomes through the development of informatics tools and resources that (1) offer novel and significant advances in the use of biological data and/or (2) will enable and stimulate advances through their impact on a significant segment of the biological research community supported by the NSF BIO Directorate.

As per the NSF Proposal and Award Policies and Procedures Guide, Chapter 1.B, BIO does not provide support for research with disease related goals, including work on the etiology, diagnosis and treatment of physical and mental disease, abnormality, or malfunction in human beings or animals. Animal models of such conditions and the development and testing of drugs and other procedures for their treatment also are not eligible for support.

The submission of duplicate or substantially similar proposals concurrently for review by more than one program without prior NSF approval may result in the return of such proposals without review. Research proposals to BIO cannot be duplicates of proposals to any other Federal agency for simultaneous consideration. The only exceptions to this rule applicable to the ABI program are proposals from PIs who are beginning investigators (individuals who have not been a principal investigator (PI) or co-principal investigator (co-PI) on a federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants). For proposers who qualify under this exception, the box for "Beginning Investigator" must be checked on the proposal Cover Sheet.

II. PROGRAM DESCRIPTION

The Advances in Biological Informatics program seeks to support research that enables investigators to make use of biological data and information for the discovery of new knowledge and the advancement of the field of biology. The Program supports a range of activities along a continuum, from the formative, theoretical development of new algorithms, data structures, and tools specific to the curation of biological information, through the development of new information resources to the enhancement of established resources needed by whole communities of biological researchers. However, the highest priority of the ABI program as reflected in this solicitation is on supporting proposals that address the formative stages of this continuum. Examples include new tools which scale well to complex biological data, theoretical research on data structures, design of easy-to-use interfaces and tools for data input, manipulation, analysis and extraction, and planning and prototype development of new types of biological data- or knowledge-bases. Research supported by ABI must lead to the solution of problems in biology. Multidisciplinary research is encouraged and requires prior coordination with the program manager.

The ABI program encourages research on and/or the development of the following:

- New data types, algorithms, and methods for recognizing and understanding complexity and connectivity in biological systems across multiple scales of organization from molecules to ecosystems;
- Algorithms, software or ontologies related to the retrieval, integration, and use of heterogeneous biological information, for example, data-mining, search, portals, semantic integration or visualization;
- Tools that can facilitate biological research work-flows, analytic pathways, or integration between the field and the laboratory, or between observation, experiments and models;
- Software and methods for making use of new technologies for the acquisition, communication or visualization of biological data;
- New methods and tools for the construction, operation, and utilization of biological databases, including research into database architectures and infrastructures, data standards designed to be extendable to different biological domains, and data structures for new types of biological information; and
- Informatics tools and approaches that bridge interdisciplinary differences in concepts and data between biology and other sciences.

The above examples are by no means exclusive. Any proposal that is designed to meet the goals of the Program will be considered. The Program especially encourages imaginative and novel proposals to develop transformative research tools and resources that will open up completely new ways of managing and utilizing large amounts and disparate kinds of biological information.

The ABI program encourages proposals which conduct collaborative and planning activities such as workshop series, network retreats, exchange visits, and the development of virtual organization frameworks. Those activities which promote interaction between the computational sciences and biology communities, as well as innovative networking strategies that foster research collaborations or enable new research directions, are especially encouraged. Activities which increase participation of colleagues at small institutions, minority-serving institutions, community colleges, and secondary school teachers are also recommended.

Recognizing that the use of computational and informatics tools and the creation of databases to disseminate results have become increasingly integral to activities supported by all BIO programs, the ABI program will place a higher priority on proposals that create computational / informatics tools and database architectures which are applicable to multiple biological domains. Proposals to build databases largely geared towards the public dissemination of sub discipline-specific biological research results or tools which operate on specialized sets of data should be submitted to the relevant BIO programs that support that research.

III. AWARD INFORMATION

Estimated Number of Awards: 20 to 25

Anticipated Funding Amount: Approximately \$20 million annually, subject to the availability of funds.

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds, the quality of submissions, and the anticipated benefits to biology. Both standard and continuing grants will be awarded. The specific grant type will be determined on a proposal by proposal basis. The anticipated date of awards for proposals submitted by the August target date each year is late January of the following year.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

- Organizations ineligible under this solicitation to submit proposals (federal government laboratories, federally funded research and development centers, for-profit organizations, and state and local governments) may not receive subawards from this program. Investigators who are employed at ineligible organizations may participate as collaborators but their research support must be provided from non-NSF sources. Those investigators who hold a joint appointment with an eligible organization may participate through that affiliation except that they may not receive salary from the NSF funds. International collaboration is encouraged; however, financial support for any non-U.S. participant organization must be provided from within the participant's country or other non-NSF sources.

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:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the guidelines specified 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. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-PUBS (7827) or by e-mail from nsfpubs@nsf.gov.

The following information provides instructions that supplement the GPG.

Project Description (maximum length 15 pages):

Proposals should address the project goals, the anticipated product(s) of the work, and implications for biological informatics with specific reference to the anticipated impact on the community served by the proposed developments.

Proposals should discuss plans for making the products of research, e.g. software and databases, available to the biological sciences research community.

Proposals should identify the biological user community and provide evidence of the biology community's desire for the proposed work. Proposals should also explicitly state how the proposed work will expand the capabilities of the biology research community.

Proposals should include a detailed software or database development plan, data schema, protocol standards, including design and metadata standards, when appropriate. This section should include proposed architecture and implementation schedule. Existing community driven standards should be utilized where they exist. To improve broader impact, preference is given to proposals that provide community access to source software, data and methods.

Proposals should include a management plan which identifies the personnel responsible for all major tasks with time schedules for all members of the team for the duration of the project; annual milestones for judging productivity and progress; means of communication and data management within the project team; training and outreach activities, including field, laboratory, and museum experiences for trainees, leadership development for key team members, and integration of new team members; and plans for coordination with other projects. The management plan should also provide a clear statement of management of intellectual property rights and how the project plans to share information, data, tools, and resources that result from the activities supported by the NSF award, and that result from activities at the project regardless of the source of support. Be specific about the nature of the results to be shared, and the timing and means of release. Describe how tools and resources that may have broad applicability will be made accessible and usable by the broader community of biologists and by those in other disciplines.

Proposals should provide a sustainability plan which presents a well-developed plan for the long-term (i.e., beyond the term

of NSF support for this project under the planned award) preservation of data and tools for which the project has responsibility (i.e., deliverables generated by the project). Describe the process the project will use in selecting which deliverables are appropriate for long-term preservation. Alternative models for long-term sustainable financial support of important community information resources should also be addressed. These plans may include the use of resources provided through NSF cyberinfrastructure initiatives as well as other resources that provide opportunities for economies of scale. Programs such as SBIR should be referenced where appropriate.

In accordance with the broader impact review criterion, proposals should describe specific plans to address broader impacts of the proposed activity (see Section VI of this solicitation for additional information and a link to examples).

Note: Inclusion of a web site to provide additional information about the proposed project is not allowed. Reviewers will be advised to review what is presented in the 15 pages and not to consider additional information provided on a web site. For further information, see GPG Chapter II.C.2d(ii).

Budget:

For major equipment or software materials, a particular model or source and the current or expected price should be specified whenever possible. This section should also include details of other sources of support for the project, such as government, industry, or private foundations. Funds for facility construction or renovation may not be requested.

Facilities, Equipment, & Other Resources (maximum length 2 pages):

Include a brief description of available facilities, including space and computational equipment available for the project. Where requested equipment or materials duplicate existing items, explain the need for duplication.

Special Information and Supplementary Documentation:

In addition to any applicable documentation described in the GPG, projects requiring collaborative effort by an individual not employed at the submitting institution or subawardee's institutions should submit a signed letter of commitment from the individual. Besides indicating a willingness to collaborate, the letter should provide a brief outline of the goals of the collaboration and estimate the time and effort the individual expects to devote to the collaboration. Biographical sketches are not required for such individuals, unless requested by NSF. A collaborator whose primary purpose is advisory (e.g., service on a committee that will provide advice to the project) does not need to provide such a letter. No general letters of support or endorsement are allowed.

Single Copy Documents:

A conflict of interest document – Prepare a list, in the form of a single alphabetized table, consisting of the full name (last, first, MI) of all people having a conflict of interest with any senior personnel and others whose biographical sketches are included in the proposal. Conflicts to be identified are (1) Ph.D. thesis advisors or advisees, (2) collaborators or co-authors for the past 48 months including postdoctoral mentors and mentees, and (3) any other individuals or institutions with which the senior personnel has financial ties.

In addition to the conflict of interest document, other correspondence to the program not intended to be sent to reviewers such as a list of potential reviewers can be sent through the Single Copy Document section of FastLane.

Proposers are reminded to identify the program solicitation number (Populated with NSF Number at Clearance) 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.

B. Budgetary Information

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

C. Due Dates

• **Full Proposal Target Date(s):**

August 12, 2008

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August 11, 2009

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D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this program solicitation through use of the NSF FastLane system. Detailed instructions regarding the technical aspects of proposal preparation and submission via FastLane are available at: <http://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. 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>.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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

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>.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

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.

B. Review and Selection Process

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

In addition, reviewers of proposals to ABI will focus on the following issues:

- responsiveness to the program scope;
- responsiveness to demonstrated need within the biological research community
- potential to advance biological research;
- effectiveness of the proposal in describing technical advances and new scientific discoveries;
- soundness and openness of the management plan;
- soundness of the plan for sustainability of databases or software after the NSF award period;
- quality of the training environment for junior scientists and/or mid-career scientists wishing to retool (if applicable); and
- commitment to promoting participation of members of under-represented groups.

Where appropriate, reviewers will also consider:

- cohesiveness and soundness of the planned coordination for a multi-investigator project;
- efficiency and cost-effectiveness of the proposed approach for infrastructure development; and
- extent to which the project leverages resources or facilities supported through fundamental cyberinfrastructure investments by NSF such as supercomputing centers, data repositories, grid environments, or software development centers.

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

A. Notification of the Award

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

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 Research 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/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@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.

C. Reporting Requirements

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.

For all collaborative awards, a single, integrated report for the entire project must be appended to the individual report submitted by each awardee.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Peter McCartney, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, 615 N, telephone: (703) 292-8470, email: dbiabi@nsf.gov
- P. Bryan Heidorn, Program Director, Directorate for Biological Sciences, Division of Biological Infrastructure, 615 N, telephone: (703) 292-8470, email: dbiabi@nsf.gov
- Lita M Proctor, telephone: (703) 292-8470, email: dbiabi@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

IX. OTHER INFORMATION

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, National Science Foundation Update is a free e-mail subscription service 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 when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

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>.

Support for biological informatics activities that address a specific biological research question or for operation of cyberinfrastructure used by a specific user audience should be sought from programs that serve those research communities. Several research programs within the BIO Directorate support database applications within the context of research projects.

In addition, the [Science and Engineering Information Integration and Informatics program](#) in the Information and Intelligent Systems Division (IIS) of the Directorate for Computer and Information Science and Engineering (CISE) supports computer science research on integration of information and informatics applications in all sciences. With the SEIII program, NSF intends to support a group of projects that will advance the understanding of technology to enable scientific discovery, and that will creatively integrate research and education for the benefit of technical specialists and the general population. In determining where to seek support, recognize that biological informatics research and developments occur over a continuum, from database systems research to database application maintenance and data curation. The support of fundamental database research rests with the [Information and Data Management program](#) in IIS/CISE. Support of software application maintenance and data management rests with the appropriate BIO Directorate research program.

The [Office of Cyberinfrastructure \(OCI\)](#), in conjunction with BIO and other Directorates, periodically support programs closely related to ABI including advanced computing infrastructure, long-term data preservation, data interoperability, software development, and other topics.

Finally, NSF periodically offers [foundation-wide initiatives](#) that may compliment the informatics and cyberinfrastructure goals of ABI. Cyber-Enabled Discovery and Innovation (CDI) is one such program for proposals which create revolutionary science and engineering research outcomes made possible by innovations and advances in computational thinking. These proposals should also define a bold multidisciplinary research agenda that, through computational thinking, promises paradigm-shifting outcomes in more than one field of science and engineering.

ABOUT THE NATIONAL SCIENCE FOUNDATION

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.

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