

Microbial Observatories (MO) and Microbial Interactions and Processes (MIP)

Program Solicitation

NSF 04-586

Replaces Document 03-571



National Science Foundation

Directorate for Biological Sciences

Division of Molecular and Cellular Biosciences

Full Proposal Target Date(s):

August 23, 2004

First Monday in August

thereafter, up to and including August 6, 2007

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Microbial Observatories (MO) and Microbial Interactions and Processes (MIP)

Synopsis of Program:

Microorganisms are the oldest, most diverse and most abundant forms of life on Earth. However, the identity, physiology and interactions of the vast majority of these microbes, as well as the processes they mediate in the environment, remain unknown or poorly understood. Advances in molecular biology, genomics and bioinformatics, and cultivation technologies herald a new age of exploration of the microbial world. The Microbial Observatories (MO) and Microbial Interactions and Processes (MIP) activities will support research to discover and characterize novel microorganisms, microbial consortia, communities, activities and other novel properties, and to study their roles in diverse environments.

The Microbial Observatories activity is a continuation of MO competitions held since 1999 (for a list of prior awards, see <http://www.nsf.gov/bio/pubs/awards/mo.htm>). The long-term goal of this activity is to develop a network of sites or "microbial observatories" in different habitats to study and understand microbial diversity over time and across environmental gradients. Projects supported are expected to establish or participate in an established, Internet-accessible knowledge network to disseminate information resulting from these activities. In addition, educational and outreach activities such as formal or informal training in microbial biology, and activities that will broaden the participation of underrepresented groups in microbial research and education are expected.

Microbial Interactions and Processes (MIP) expands the range of the MO competition to support microbial diversity research projects that need not be site-based, and that are smaller and/or shorter in duration than MO projects. This expanded activity will fund integrative studies that explore novel microorganisms, their interactions in consortia and communities, and aspects of their physiology, biochemistry and genomics in relationship to the processes that they carry out in the environment.

Cognizant Program Officer(s):

- Matthew D. Kane, Program Director, Directorate for Biological Sciences, Division of Molecular & Cellular Biosciences, 655 S, telephone: (703) 292-7186, fax: (703) 292-9061, email: mkane@nsf.gov

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

- 47.074 --- Biological Sciences

Eligibility Information

- **Organization Limit:** None Specified.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 10 awards each for MO and MIP per year.
- **Anticipated Funding Amount:** \$6,500,000 annually pending availability of funds.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard 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.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Full Proposal Target Date(s):**
August 23, 2004
First Monday in August
thereafter, up to and including August 6, 2007

Proposal Review Information

- **Merit Review Criteria:** National Science Board approved criteria apply.

- **Award Conditions:** Additional award conditions apply. Please see the full text of this solicitation for further information.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

Of the tens of millions of species of living organisms on Earth, only about 1.75 million have been scientifically described. The vast majority of undescribed species are prokaryotic (bacteria, archaea) and eukaryotic microorganisms (algae, protozoa, fungi). This reservoir of organismal diversity remains largely unexplored despite a range of colonizable habitats, biochemical and molecular processes, genomic variation, and consortial/symbiotic behavior far greater than that shown in larger, multicellular organisms. Prokaryotic and eukaryotic microbes are key elements of food webs, may inhibit or trigger significant ecological events (e.g. harmful algal blooms), and are responsible, directly or indirectly, for the health or diseases of larger organisms. Microorganisms produce numerous bioactive compounds, some of which are the basis for novel pharmaceuticals or other commercially useful products. Microbial communities are known to play fundamentally important roles in biogeochemical cycles. Studies of microbial evolution at the genetic and genomic levels provide important clues about how microbial attributes appear, and are exchanged among cells and species in nature. To discover and understand the diversity of microorganisms, their interactions and novel processes remain major challenges in biology.

In September 2002, a workshop was held for PIs that had been funded by the Microbial Observatories and Life in Extreme Environments (LExEn) programs. The chief recommendations from that workshop (for full report see: <http://simo.marsci.uga.edu/MainWeb/pages/MOLExEnWorkshop.pdf>) were that the MO activity should be continued, but that a complementary opportunity for smaller microbial diversity projects that were not necessarily site-based was also critically needed. In response to that recommendation, in FY 2003 the MO activity was broadened to include Microbial Interactions and Processes (MIP).

II. PROGRAM DESCRIPTION

The guiding themes of the Microbial Observatories (MO) and Microbial Interactions and Processes (MIP) program are: (1) discovery of large numbers of as yet undescribed microorganisms and microbial consortia from diverse habitats; and (2) characterization of novel biochemical, metabolic, physiological, genomic and other properties and processes of newly described or poorly understood microbes and microbial communities. Both MO and MIP proposals must describe how the work will make a substantial impact on scientific understanding of the diversity of microorganisms and microbial communities and their role in diverse environments. By contrast, explicitly discouraged are those that lack a dimension beyond species discovery and routine phylogenetic characterization, or those addressing the molecular and cellular biology of a microorganism in the absence of a direct environmental context.

Examples of additional aspects of microbial diversity research that **either MO or MIP** proposals might address include but are not limited to:

- Studies to determine the phylogenetic, physiological, metabolic and genomic properties and mechanisms responsible for microbial growth, adaptation and survival in natural environments;
- Studies of the mechanistic basis of interactions among microbes in communities and multispecies biofilms, and of microbes with co-habiting non-microbial species, including mechanisms for the exchange of genetic material;
- Studies of the diversity of microbial processes for anaerobic and aerobic flow of energy and cycling of nutrients, including aquatic, soil/rhizosphere, and sediment ecosystems;
- Patterns of microbial distribution in time and space, and in response to specific environmental gradients; and
- Integrative studies of the diversity, physiology, biochemistry and genomics of microorganisms and microbial communities and the processes that they carry out in the environment.

Development and application of genomics, functional genomics and proteomics approaches to these studies are encouraged. Proposals in either the MO or MIP category that show evidence of collaborative arrangements between academic and/or commercial groups to conduct more detailed investigations on particular microbes or microbial communities also are encouraged.

The MO and MIP program encourages laboratory-to-laboratory interactions between U.S. and foreign organizations or institutions to address program goals. NSF funds may be requested to support foreign investigators and students to work in U.S. laboratories and for U.S. investigators and students to work in international laboratories. However, foreign counterparts should secure support for their projects from their own national programs.

The NSF Division of Molecular and Cellular Biosciences expects to hold an annual meeting of all MO and MIP awardees engaged in microbial discovery activities. The purpose of this meeting will be to facilitate an exchange of ideas and information; to promote interaction among investigators and sites; and to build links between research programs with related or complementary objectives. Each project should include sufficient funds in its budget request to cover the costs for one representative [preferably the Principal Investigator and/or Co-Principal Investigator(s)] to attend this meeting.

Principal Investigators may not submit to other NSF programs or competitions for simultaneous review the same proposal or proposals that significantly overlap. See the [Grant Proposal Guide](#) for further information.

MO proposals should also include aspects of the following elements:

- Five year exploration of a particular site or habitat for previously undescribed microbes; and, where necessary, developing methods to sample, quantify, monitor, culture and experimentally manipulate previously undescribed microbes and microbial consortia;
- Establishment or participation in an established Internet-accessible knowledge network to disseminate the information resulting from this activity, including Internet-accessible databases to facilitate the exchange of information among persons and groups likely to be interested in these findings, and through which more detailed investigations on particular microbial species or assemblages may be conducted, either at the site or elsewhere; and
- Educational and outreach activities, such as formal/informal training for persons interested in microbial biology research, and activities that will broaden the participation of underrepresented groups.

Investigators with access to long-term environmental data and existing infrastructure - including long-term ecological research sites, biological field stations, marine and freshwater laboratories, or other similar facilities - are encouraged to submit proposals to the MO category. However, funds may not be requested or used for construction or renovation of facilities.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

The NSF expects to fund approximately 10 awards in each category per year, depending on the quality of submissions and the availability of funds. **For MO projects**, awards are expected to be for five years, and total award size (all years, whether single institution or collaborative) is expected to range between \$500,000 and \$2,000,000. **For MIP projects**, awards are expected to be for up to four years and total award size is expected to range up to \$500,000. All awards will be made as grants subject to specified reporting procedures.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions:

Proposals submitted in response to this program announcement/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/cgi-bin/getpub?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.

The following information/guidelines supplement the GPG. Please note that the title for Microbial Observatories proposals should begin with "MO:" and the title for Microbial Interactions and Processes proposals should begin with "MIP:"

Project Description for MO Proposals. For MO proposals, the project description should describe the strategies, protocols and timetables to be used in experimental procedures, as well as in collecting, preparing, documenting and distributing the microbes to be examined in sufficient detail to allow informed judgement by expert reviewers. Also include: type(s) of site(s) and how it relates to the questions posed; methods for collecting, processing, vouchering and storing samples of biological materials such as soil, water or sediment, specimens, tissues or DNA; the data to be recorded at the times of sampling; the repository for collections and accompanying data sets; the means by which collection and experimental data, along with other products, will be made available to the research community and other users.

Management Plan for MO Proposals. Each MO proposal should include a management plan of up to 3 pages in length in the Supplementary Documents section of the proposal. This section is in addition to the 15 pages of Project Description. The Management Plan should detail the duties and responsibilities of participants, including identification of a research team leader (usually the lead PI) and the operation of associated partners and knowledge networks. If the research is to be conducted in whole or in part on one or more organized sites for environmental research, then the Plan must describe how the MO research will be coordinated with other activities at the site(s), and that approval of the Director(s) of the site(s) has been secured. The Management Plan should also indicate that all relevant permits and permissions have been, or will be obtained prior to an award. Arrangements made with existing stock centers or community databases for distributing research resources and data resulting from the MO projects must be described. Any costs associated with their distribution should be requested in MO proposals unless the other parties agree in writing to bear such costs. Specific arrangements made with other parties for the further exploration of selected types of discoveries should be spelled out. Any supporting documents regarding items discussed in the Management Plan should also be included in the "Supplementary Docs" section of the FastLane submission.

Electronic Products. Describe the electronic database and other information (e.g., catalogs, descriptions, phylogenetic analyses, associated genetic, biochemical, molecular and environmental data, or other innovative products) that will result from the project. In projects that involve existing research sites, discuss the use of existing electronic networks in databasing and dissemination of the research results. Description of database and information provision over the Internet should include networking protocols, the integration of the specimen databases with other electronic information resources, and the means by which the availability of the products of the research will be sustained into the future. Letters from directors of computer centers or other units that house Internet servers may document the last item. Include letters in the "Supplementary Docs" section of the FastLane submission.

Coordination among MO Projects. If an MO project is already funded for work at the proposed site or a related habitat, (check the NSF FastLane website for award listings), the PI should provide a plan for coordinating activities with the funded project. If two or more proposals with substantially overlapping goals and scope remain in consideration for funding after initial merit review, the PIs of those proposals may be asked to collaborate, and to submit a coordination plan prior to the final funding decision.

Projects involving work in foreign countries. For studies in countries other than the United States, include in the project description a discussion of established collaborations with scientists and students from the host country, and how these individuals will be involved in the project, as well as the arrangements for the in-country housing of specimens and data. Arrangements to allocate specimens between host country organization(s) or institution(s) and U.S. organization(s) or institution(s) may be made, but type specimens and quality representative specimens should remain in the host country. Prior to an award, PIs must provide confirmation that they have obtained necessary research agreements and all legally required collecting, import, and export permits. These documents include those needed not only to remove specimens from the field, but also those required to export or import them across national boundaries, including compliance with CITES regulations. Provide letters of collaboration and/or collecting-permit documents in hand at time of submission in the "Supplementary Docs" section of the FastLane submission.

Projects in the oceans and U.S. Great Lakes. Proposals that require the scheduling of NSF-UNOLS ship time must include a completed NSF-UNOLS Request Form (NSF Form 831). The UNOLS form may be obtained from the NSF Division of Ocean Sciences Ship Operations Program or directly from the UNOLS website (at <http://www.unols.org/>). If the project requires time aboard non-UNOLS vessels, the proposal budget must reflect the direct cost of ship time. Use of UNOLS or other ship time also requires that permits to enter sovereign waters, in compliance with international laws of the sea, be obtained with the assistance of the U.S. Department of State if the researchers plan to collect specimens in any nation's sovereign waters. The Ship Operations Program of the NSF can assist in these negotiations. Contact information can be found on the NSF website for the Directorate for Geosciences, Division of Ocean Sciences at <http://www.geo.nsf.gov/oce>.

Projects in Antarctica or Greenland. Proposals that involve field work in Antarctica must include information about the logistic and operational requisites of the proposed research, and any environmental impacts. Instructions on proposal preparation for research in Antarctica are provided in the Program Announcement and Proposal Guide for the Antarctic Program of the Office of Polar Programs (OPP), currently NSF 04-559 (<http://www.nsf.gov/pubsys/ods/getpub.cfm?nsf04559>). Obtain information on working in Antarctica from the OPP prior to preparation of a proposal. All research projects in Greenland must be approved in advance by the Government of Denmark. Applications for projects in which U.S. citizens and U.S. nationals are involved in any way (logistic, operational and/or financial support) shall be submitted to the Danish Government through diplomatic channels (i.e., through the U.S. Department of State and the American Embassy, Copenhagen) to the Danish Ministry of Foreign Affairs. The Arctic Research Program of OPP can assist in the submission of these applications, and should be contacted for instructions prior to preparation of a proposal.

BIO Proposal Classification Form (PCF). Complete the BIO PCF, available on the NSF FastLane system. The PCF is an on-line coding system that allows the Principal Investigator to characterize his/her project when submitting proposals to the Directorate for Biological Sciences. Once a PI begins preparation of his/her proposal in the NSF FastLane system and selects a division, cluster, or program within the Directorate for Biological Sciences as the first or only organizational unit to review the proposal, and saves the cover sheet, the PCF will be generated and available through the Form Preparation screen. Additional information about the BIO PCF is available in FastLane at <http://www.fastlane.nsf.gov/a1/biopcf.htm>.

Vertebrate Animals. If the proposed research includes the collection of vertebrate animals, the Principal Investigator must respond to the required documentation for proposals involving vertebrate animals (see GPG for more information). Provide documentation in the "Supplementary Docs" section of the FastLane submission.

Letters and Permits. Provide information such as letters of collaboration, collecting permits, and environmental impact statements in the "Supplementary Docs" section of the FastLane submission.

Proposers are reminded to identify the program announcement/solicitation number (04-586) in the program announcement/solicitation block on the proposal Cover Sheet. 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 in proposals submitted under this Program Solicitation.

Other Budgetary Limitations:

Each project should include sufficient funds in its overall budget request to cover the costs for at least one representative [preferably the Principal Investigator and/or Co-Principal Investigator(s)] to attend the MO & MIP annual meeting.

C. Due Dates

Proposals must be submitted by the following date(s):

Full Proposal Target Date(s):

August 23, 2004

First Monday in August
thereafter, up to and including August 6, 2007

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal 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. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

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. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). 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 he/she is qualified to make judgments.

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 and original 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?

NSF staff 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 Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc and/or panel review.

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.

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 Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

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 Division 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.A. 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 (NSF-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 agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at <http://www.gpo.gov>.

Special Award Conditions:

Special specimen collection conditions apply. The awardee shall ensure that award activities carried on both inside and outside the U.S. and its territories and possessions are coordinated, as necessary, with appropriate Government authorities, and that appropriate licenses, permits or other necessary approvals are obtained prior to undertaking proposed activities. NSF does not assume responsibility for awardee compliance with the laws and regulations of the country in which the work is to be conducted.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

The Principal Investigator shall provide a summary in the "Special Requirements" section of each annual and final project report of all licenses, permits or other necessary approvals associated with specimen collection. The information should include all relevant details, such as the granting authority, date acquired, duration and results.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. 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. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, 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.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Matthew D. Kane, Program Director, Directorate for Biological Sciences, Division of Molecular & Cellular Biosciences, 655 S, telephone: (703) 292-7186, fax: (703) 292-9061, email: mkane@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-873-6188, email: fastlane@nsf.gov
- email: biofl@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF *E-Bulletin*, which is updated daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's *Custom News Service* (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

In addition to the Research in Undergraduate Institutions (RUI) activity described below, NSF offers a variety of research opportunities relevant to microbial biology. An annotated directory of these programs can be found at: <http://www.nsf.gov/bio/mcb/microbe/list.htm>.

The Research in Undergraduate Institutions (RUI) activity supports research by faculty members of predominantly undergraduate institutions through the funding of (1) individual and collaborative research projects, (2) the purchase of shared-use research instrumentation, and (3) Research Opportunity Awards for work with NSF-supported investigators at other institutions. RUI proposals are evaluated and funded by the NSF programs in the disciplinary areas of the proposed research. The Program Announcement is available on the NSF website at: <http://www.nsf.gov/pubsys/ods/getpub.cfm?nsf00144>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation

does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

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
 - or telephone: (703) 292-7827

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PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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