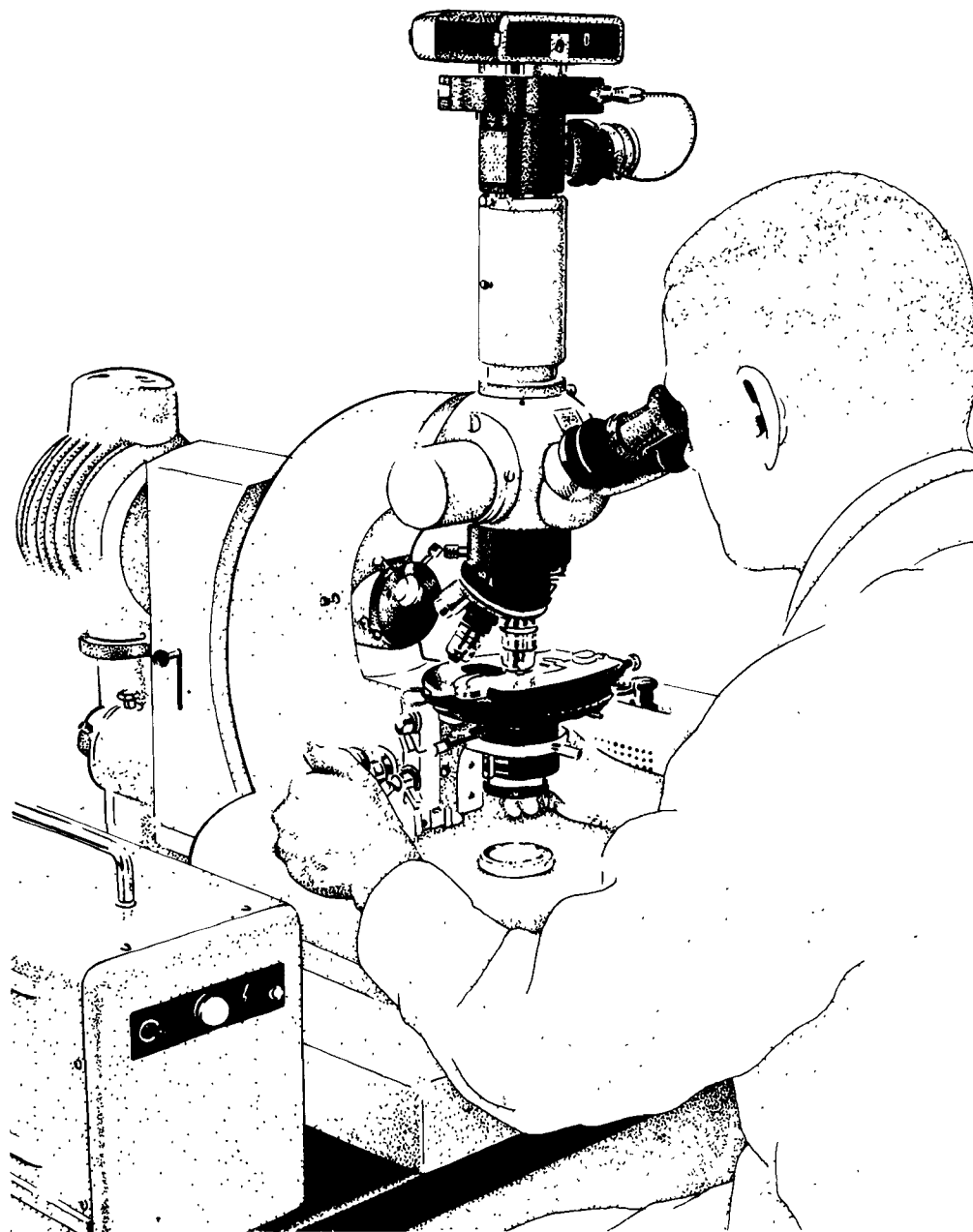




# Solicitation for Research Grant Proposals



---

## ***Exploratory Research Grants***

### **Introduction**

The U.S. Environmental Protection Agency (EPA) is responsible for implementing laws designed to mitigate or prevent environmental pollution. Central to the execution of its responsibility is the need for reliable, high quality scientific and technical information. Recognizing that some of the information needed to address current or emerging problems is not available, the Agency has established a long term, exploratory research program.

As part of this long term research effort, EPA's Office of Research and Development (ORD) established the Research Grants Program within the Office of Exploratory Research (OER) in 1980. The objective of this program is to develop an effective means to stimulate extramural scientists to work on EPA's technical problems, to complement existing EPA programs and to provide a stronger creative base for mission-oriented research needed for the Agency's regulatory and enforcement purposes. To date, through its Research Grants Program, OER has supported over 500 research projects in various priority areas as identified by the Agency's program planning mechanisms and ORD's Research Committees. This year, ORD's research priorities are in four major areas:

- human health risk assessment methods: development and application;
- ecological risk assessment methods: development and application;
- total exposure assessment methods: development and application;
- risk reduction research concerned with reducing or eliminating the release of toxicants to the environment.

Grants are an important means by which EPA underwrites research on environmental topics in the academic sector. Therefore, this document solicits investigator-initiated proposals to address ORD's priority research needs. This solicitation relates only to the research grants procedures as administered by the ORD's Office of Exploratory Research and outlines the procedures for applying for grant assistance. Participation in the research grants assistance program does not preclude individuals or institutions from engaging in EPA-sponsored research supported through

---

cooperative agreements or contracts with ORD laboratories. Those interested in these aspects of EPA's research and development programs are encouraged to consult directly with officials at the EPA laboratories. A list of these laboratories appears in Appendix A.

This solicitation describes the principal areas of interest and specific research needs in these program areas:

- Environmental Biology
- Environmental Health
- Environmental Engineering
- Environmental Air/Water Chemistry and Physics

Although this document emphasizes certain needs in the aforementioned research areas, it is by no means all inclusive. Every scientifically meritorious proposal will be accorded full and fair consideration. The legislative and administrative limitations of this program require, however, that applications must be germane to EPA's mission.

## **Application Procedures**

In the past, the Research Grants Program has accepted applications that responded to the regular annual solicitation. This year, in addition, applications will be accepted which respond to more narrowly defined proposal requests, the Request for Applications (RFA). Application procedures for both mechanisms are outlined below.

### *Regular Grants*

Application forms, instructions, and other pertinent information are available in the EPA Research Grant Application/Information Kit. It is recommended that interested investigators review the material in this kit before preparing an application for assistance. The kits are available from:

Grants Operations Branch  
Grants Administration Division (PM-216)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

or

Research Grants Staff  
Office of Exploratory Research (RD-675)  
Office of Research and Development  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

---

Fully-developed research proposals, prepared in accordance with instructions in the Application for Federal Assistance Form No. 5700-12, should be sent to:

Grants Administration Division (PM-216)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

A pre-addressed mailing label is provided in the Application/ Information Kit.

If this solicitation is the basis for submitting a proposal, the fact may be entered on line 3 of Form 5700-12.

One copy of the application with original signatures plus eight copies are needed. Informal, incomplete, or unsigned proposals will not be considered.

While applications are accepted year round, proposals will be evaluated at regular (approximately semi-annual) intervals (see table below). Applicants should contact the appropriate Science Review Administrator, whose name appears at the end of each program area description, for dates of the next scheduled peer review panel meetings.

<i>Solicitation Publication</i>	<i>Application* Closing Date(s)</i>	<i>Panel Review Meeting</i>	<i>Relevancy Review</i>	<i>Earliest Date for Notification of Award</i>
<i>September</i>	<i>Feb. 15th</i>	<i>Apr/May</i>	<i>June/July</i>	<i>August</i>
	<i>Aug. 15th</i>	<i>Oct/Nov</i>	<i>Dec/Jan</i>	<i>February</i>

*\*While applications are accepted year round, to be considered by a specific review panel, applications should be received no later than six weeks prior to the scheduled review meeting date.*

#### *Special Targeted Grants*

Often the Agency needs to expand or explore a new research area in which current Agency efforts are either minimal or non-existent. In this context, targeted grants will be awarded to focus solely toward advancing the state of knowledge in a narrowly defined area. While still exploratory, these grants will be aimed at determining whether a more formal research effort should be established, and if so, in what direction. The Office of Exploratory Research addresses this targeted grant need by issuing a special solicitation called the "Request for Applications" (RFA). The RFA is a mechanism by which a formal announcement is

---

released describing a high priority initiative in a well-defined scientific area. Applicants will be invited to submit research applications for a one-time competition using the standard application for Federal Assistance Form No. 5700-12. One copy of the application with original signatures plus eight copies are to be mailed directly to:

Research Grants Staff  
Office of Exploratory Research (RD-675)  
Office of Research and Development  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

Funds for this special mechanism are generally set aside for a specified number of awards (expected to be five to ten awards per RFA). The deadlines for receipt of applications are identified in the announcement. All responses received are reviewed by specially convened *ad hoc* peer review panels. The two Request for Applications issued by OER this fiscal year are printed in Part II of this Solicitation.

### **Eligibility**

A research grant application will be considered when a fully developed proposal is submitted on the required Application for Federal Assistance Form 5700-12, provided that

- The proposed project is for research (as opposed to development, demonstration, surveys, or preparation of materials and documents)
- The proposed project directly pertains to EPA's mission
- The proposed project addresses fundamental aspects of environmental problems
- The applicant is eligible to apply under the Federal laws that authorize EPA to award research grants

Nonprofit institutions and state or local governments are eligible under all existing authorizations. Profit-making firms are eligible only under certain laws, and then under restrictive conditions, including the absence of any profit from the project.

Potential applicants who are uncertain of their eligibility should study the restrictive language of the law governing the area of research interest. This information is provided in the Research Grant Application/Information Kit. All applicants must provide a minimum of 5% of the total project cost. These costsharing funds may not be taken from other Federal sources.

---

Investigators at minority institutions or those who have not previously received support are encouraged to submit applications (See Minority Programs Section).

**Review  
Process**

All applications will initially be reviewed by the Agency to determine their legal and administrative acceptability.

Acceptable applications will then be reviewed by the appropriate peer review panel. This review is designed to evaluate and rank each proposal according to its scientific and/or technical merit as a basis for recommending Agency approval or disapproval. Each peer review panel is composed primarily of non-EPA scientists and engineers who are acknowledged experts in their respective disciplines.

The panels use the following criteria in their review:

- Quality of research plan (including theoretical and/or experimental design, originality, and creativity)
- Qualifications of principal investigator and staff including knowledge of subject area
- Potential contribution to scientific knowledge
- Availability and adequacy of facilities and equipment
- Budgetary justification

Proposals which receive a panel's approval based upon scientific merit are further evaluated by EPA officials for relevance to the Agency's mission and budget appropriations. It is iterated that scientifically approved applications must be germane to EPA's mission to be funded. A summary of the scientific review and recommendation of the panel(s) will be provided to each applicant.

**Environmental  
Health**

The major objective of the Environmental Health Research Program is to obtain and provide a scientific basis upon which the Agency can make regulatory decisions concerning human health risk assessment after exposure to environmental pollutants. The principal concern is to determine whether, and to what extent, exposure to various pollutants contribute to environmentally related health risks.

Areas of interest include but are not limited to:

- Improved Models and Methodologies for Human Risk Assessment
  - Development of methods to assess the risk of environmental contaminants for a variety of health

---

endpoints other than cancer (including reproductive, developmental, behavioral immunological, neurological and cardiovascular disorders, renal disease, chronic bronchitis and emphysema).

- Develop short-term assays which mimic the metabolism and/or the molecular, cellular or biochemical process being affected by specific toxicants.
  - Development of more extensive *in vivo* and *in vitro* assays for all classes of potentially toxic chemicals considered relevant to humans at risk.
  - Studies of pharmacokinetics to determine the body burden and effects of ingested and otherwise contacted chemical and physical toxic agents.
  - Studies to determine the adverse effects of environmental toxicants on the immune function, and ways to enhance immune response.
  - Studies to determine the effect of predisposing factors (e.g., genetic, hormonal, nutritional factors, biological rhythm, previous exposure, disease state, etc.) on reaction to toxic agents.
  - Developments of methods to program the results obtained with validated testing strategies into an artificial intelligence to predict toxicity based on structural activity relationships.
- Risk Assessment and Predictions
- Studies directed toward improved extrapolations from high-to-low doses and from animal models to humans; long-term animal studies of chronic exposure to provide basis for high-to-low dose extrapolations.
  - Development of more sensitive techniques for measuring chemical and physical toxic agents and their metabolites in biological media.
  - Develop risk extrapolation methods incorporating information and mechanisms of action, pharmacokinetics, and information from interspecies responses to related endpoints.
  - Studies to identify the potential routes of exposure in biological systems to chemical and physical toxic agents, and the possible different toxicities manifested following exposure by these diverse routes.
  - Studies of multiple exposure models to determine possible synergistic, additive, and antagonistic effects of toxic agents.

---

—Studies that define the rates and mechanisms of chemical reactions at the cellular level of important toxic agents in the environment.

—*In vivo* and *in vitro* studies for developing and validating rapid, reproducible, and sensitive screening tests that can be used to assess potential toxicity.

- Risk Assessment in Human Populations

—Identification of target populations and effects on these target populations at risk from exposure to toxic agents. The nature and range of susceptibility should be included.

—Development of biological markers in populations to improve early detection of exposure and future chronic diseases, and to estimate their sensitivity vs. specificity.

—Development of methods to better correlate relationships between exposures and health effects resulting from chronic long-term exposure or where the interval between exposure and effect is extended. Consideration should be given to subtle effects such as genetic or behavioral toxicity as well as morbidity or mortality.

For further information, please contact:

George R. Simon, Ph.D.  
Science Review Administrator (RD-675)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460  
(202) 382-7445

## **Environmental Biology**

The Environmental Biology Research Program supports a broad range of projects in the areas of ecosystem effects, aquatic ecosystem modeling, biotechnology monitoring, environmental risk assessment, marine studies and biodegradation in water and soil environments. One objective of this program is to provide information that, in combination with exposure data, allows the prediction of the environmental risk of pollution on individual organisms and on ecosystems.

Areas of interest include but are not limited to:

- Ecological Risk Assessment

—Methods to assess and predict environmental risks resulting from single-chemical or complex mixture exposures to wetland ecosystems.

—Develop comparative risk assessment procedures to estimate the risk associated with disposal of



---

wastes containing mixtures of chemicals. Specifically, additivity rules to assess the environmental effects of complex mixtures based on single chemical dose-response relationships using bioassay and short-term effects tests to reflect relationships between hazards and exposures.

- Techniques that will permit testing and validation of laboratory findings and model verification under field conditions especially in the areas of biological availability and effects of contaminants.
- Determining the pathways, interactions, and impacts of genetically engineered microorganisms which enter environmental systems. Of particular interest are applications for environmental monitoring and ecological risk assessment
- Screening methods for predicting exposure, fate and eco-toxicity of chemicals, including chemical mixtures at low concentrations. The development of systems and models (including the structure-activity concept) through which persistence, bioaccumulation, eco-toxicity, and biodegradation may be predicted.

- Ecosystem Structure and Function

- The cycling, including sorption/desorption of pollutants and biodegradation products with long time constants in biological systems and ecological processes.
- The relationship of ecological genetics and natural selection processes as they are influenced by the impact of pollutants upon ecosystem properties
- The differential importance of components of ecosystems to the whole. Studies are solicited which assess the vulnerability of ecosystem components to natural and anthropogenic damage and the relative ecosystem resiliency and recovery.
- Modeling studies to develop new qualitative and quantitative methodologies for environmental applications to ecological processes in order to predict pollutant effects.
- Studies of pollution impacts on biotic resources in cold-climate ecosystems including the tundra and estuarine areas.

- Ecological and Toxicological Effects

- Studies delineating the effects of gaseous and particulate air pollution (e.g., acid rain) on forests, crops, and receiving waters and their biota.

- 
- Studies to examine the mechanisms by which major pollutants combine to alter plant growth and produce pathological symptoms in plants.
  - Studies on the sublethal effects of toxic chemicals and their biodegraded products on the behavior of animals.
  - Modes by which organisms (i.e., fish, algae and plants) are exposed to chemicals in freshwater and marine sediments.
  - Studies defining the role of bacteria in the movement, transfer and destruction of pollutants in soil and water.
  - Effects of chemicals on wildlife, including effects on populations and individuals.
  - Ecological significance of the loss, due to exposure to toxic chemicals, of a portion of a natural population.

For further information, please contact:

Clyde C. Bishop, Jr.  
Science Review Administrator (RD-675)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460  
(202) 382-7445

## **Environmental Engineering**

The Environmental Engineering Research Program supports fundamental research needed to provide solutions to pollution control problems outside the scope of the Agency's response-directed research program. New, innovative toxic substances control and waste management techniques are sought to provide cost-effective risk reduction through advanced multi-media (solid, liquid, gaseous) pollution control technology.

Areas of interest include but are not limited to:

- Proof-of-concept research in high-risk, high-potential technical areas.
  - Biodegradation of toxic substances; the treatment of complex mixtures of pollutants to reduce toxicity.
  - In-plant unit process operations minimizing or eliminating toxics generation and release to the environment.
  - Biotechnology advances for the degradation of toxic and/or hazardous wastes in contaminated water, ground water, and sediments and for

- 
- improving biological process treatment and mitigation of environmental pollution problems.
  - Development of improved techniques to prevent ground-water degradation and to clean up ground-water contamination.
  - Prevention technology to minimize adverse human health and ecological effects resulting from accidental releases of toxic materials.
  - Pilot-scale evaluation and cost performance testing of innovative technologies.
    - Improved thermal destruction (incineration) or other treatment techniques, e.g., biological or chemical, for the final disposition of hazardous materials.
    - Handling and disposal of hazardous solid wastes, including detoxification, solidification, and otherwise fixing organic waste before disposal in secure landfills.
    - Innovative approaches for reduction of indoor air pollution.
    - Improved techniques for low cost capture of particles less than 10 micrometers; including condensation aerosols, in retrofit applications, prior to existing stack.
    - Innovative techniques to control and/or remove toxic air emissions and VOC from industrial and/or combustion sources, including vent and flue gases.
    - Simultaneous control of particulate matter, NO<sub>x</sub> and SO<sub>x</sub> in combustion and/or post combustion processes.
    - Municipal water and wastewater sludge volume reduction and final disposal practices which lower concentrations of pathogens, heavy metals, and synthetic organics; recovery techniques for metals from industrial sludges.
    - Clean-up techniques (e.g., in-situ treatment) for contaminated soils, structures, surface and groundwater, and asbestos.
  - Fundamental thermal destruction/combustion research: leading to less pollutant production and to better incineration of hazardous waste.
    - Investigation of flame reactions, propagation, and quenching mechanisms.
    - Investigation of selective and non-selective catalysts for control of NO<sub>x</sub> and organic particulate matter in high temperature combustion processes.

---

—Predictive models for products of incomplete combustion in hazardous waste incineration.

For further information, please contact:

Donald F. Carey, B.S. Ch.E.  
Science Review Administrator (RD-675)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460  
(202) 382-7445

**Environmental  
Air/Water  
Chemistry and  
Physics**

The Environmental Chemistry and Physics of Air/Water Programs support research leading to the basic scientific tools for establishing the levels at which pollutants occur or might occur in the environment under different conditions. The program includes projects in analytical chemistry, studies on chemical reactions and their rates and on the physics of the movement of pollutants in air, water, and soil. The resulting tools and information will allow the estimation of total exposure needed for risk assessment.

This program is divided into:

- I. RESEARCH ON AIR POLLUTION*
- II. RESEARCH ON POLLUTION OF FRESHWATER, MARINE/ESTUARINE WATERS, GROUND-WATERS, SOILS AND SEDIMENTS*

Areas of interest include but are not limited to:

- I. AIR POLLUTION*
  - Exposure Monitoring Systems and Advanced Analytical Methods
    - Development of exposure monitoring systems, instruments or devices for continuous and discontinuous sampling of inhalable particulates, for volatile organic compounds, and/or for indoor air pollution studies.
    - Development of advanced analytical methods for the direct analysis of organic compounds in the gaseous and solid phases, for the rapid screening of samples for the presence of classes of organic compounds, and for the development of new sensitive and selective detectors for gas and liquid chromatography.
  - Indoor Air
    - Studies on potentially hazardous indoor air pollutants. Research should determine the

---

species and ranges of exposure concentrations for statistically significant samples of various indoor settings.

- **Transport and Fate Studies**

- Studies of the physical structure and chemical composition of fine particulates. Studies on how these particulates are formed, transported, and removed from the atmosphere
- Studies of the chemical and physical transformations of specific toxic and hazardous compounds (and their intermediates) in ambient air. Studies should include the elucidation of chemical mechanisms as well as focus on novel measurement methods for identifying these compounds in ambient air.
- Assessment and quantification of the role of solid aerosols in atmospheric reactions.
- Studies to assess whether anthropogenic emissions into the atmosphere have a significant effect on local or global climate.

- **Modeling Studies**

- Continued development and refinement of receptor model and source apportionment techniques for estimating the concentrations of ambient pollutants attributable to specific sets of emission categories.
- Development of reliable models for predicting ground based pollutant concentrations in complex terrain from single and multiple sources.
- Studies on meteorological processes which figure prominently in mathematical models of air pollution.
- Development of models capable of quantifying pollutant concentrations or deposition rates over urban, mesoscale and large areas. Probabilistic modeling of atmospheric phenomena is important.

For further information, please contact:

Louis G. Swaby, Ph.D.  
Science Review Administrator (RD-675)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 2046

---

**II. RESEARCH ON POLLUTION OF FRESHWATER, MARINE/ESTUARINE WATERS, SOILS, GROUND-WATERS, AND SEDIMENTS.**

- **Studies of transport and transformation processes in the surface and subsurface environment in order to predict the impact of surface conditions on ground-water systems.**
  - Research is needed to identify and characterize the major transport and transformation mechanisms of wastes and other contaminants introduced into soil systems.
  - Research on the mechanism of and conditions for biological transformation in the subsurface including methods for identifying and characterizing subsurface microorganisms.
- **Studies of the transport and fate of toxic chemicals in lakes, rivers, and estuarine waters with emphasis on providing information required for use in predictive exposure models.**
  - Theoretical and experimental characterizations of adsorbing surfaces, the chemical nature of adsorbed species, the microbiological action at surfaces, and the environmental factors controlling the reaction rates of adsorbed species.
  - Studies on the rates and mechanisms for abiotic transformations of toxic chemicals in natural waters including the reactions involving naturally-occurring materials such as humic substances, and inorganic species such as trace metals and hydrogen peroxide.
- **Development of predictive water quality models and techniques of varying complexity for application to toxic substances, nutrients, anoxic conditions, and resuspension of dredged material after aquatic disposal.**
  - Develop more efficient numerical methods for the solution of mathematical models.
  - Develop formal procedures to assign uncertainty to estimates provided by models, and for comparing the results from models of different complexity.
- **Research in chemistry and physics to develop advanced analytical and monitoring techniques for increasing sample through-put, sensitivity and selectivity, and for field use.**

- 
- Develop methods for identifying and quantifying non-volatile compounds in complex mixtures, adsorbed or complexed inorganic species and the complexing agents, for separating and concentrating non-volatile organics adsorbed to other materials, and for new sensitive and selective detectors for gas and liquid chromatography.
  - Develop new methods for screening a variety of samples for toxic substances and classes of organics and for monitoring waste streams.
  - Develop geophysical monitoring techniques applicable to the measurement of flow and migration rates of groundwater and leachate and for monitoring contamination of estuarine and ocean areas receiving waste discharges.

For further information, please contact:

Louis G. Swaby, Ph.D.  
Science Review Administrator (RD-675)  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460  
(202) 382-7445

---

## ***Minority Research Grant and Student Fellowship Programs***

### **Minority Institutions Assistance (MIA)**

The U.S. Environmental Protection Agency has initiated a special assistance program entitled the Minority Institutions Assistance (MIA) program. The objective of the program is to award grant funds for the support of exploratory research by faculty and to support undergraduate/graduate fellowships for students enrolled at eligible institutions. The principal purpose of this program is to provide Federal assistance to Historically Black Colleges and Universities (HBCU's) as directed by Executive Order 12320, issued on September 15, 1981.

#### **Terms and Restrictions for Research Assistance**

- Consideration will be given only to applications submitted by institutions subject to Executive Order No. 12320, and identified by the Secretary of the Department of Education as Historically Black Colleges and Universities.
- In contrast to the regular grants program, preapplication assistance is available upon request. A potential investigator may submit a preproposal for informal scientific review and determination of its relevance to Agency research goals.
- The Application Form (5700-12), instructions and procedures are the same as those used for EPA's regular research grants, except that "MIA" should be typed in item (3) on the face page to identify the program to which the application is directed
- All of the topic areas described previously for the regular research grant program are applicable to the MIA program.

#### **Terms and Restrictions for Student Fellowship Assistance**

- Consideration will be given only to applicants who are enrolled full-time and in good standing with an eligible institution (HBCU).
- The applicant must be a senior or graduate student with a cumulative Grade Point Average (GPA) of 3.0 or higher on a scale of 4.0.
- All applications will be reviewed and evaluated for the following: (1) individual's orientation towards and commitment to a career in the Physical Sciences



---

(Chemistry, Physics, Math, Engineering), Biological Sciences, Environmental Sciences, Computer Sciences; (2) Grade Point Average (GPA) verified by college transcript; (3) applicants' statement of objectives and personal goals; (4) recommendations by the sponsor and faculty; and (5) employment experience related to the field of study.

- These Student Fellowship applications must be properly executed on EPA Forms. Failure to complete all forms with appropriate signatures will delay processing or disqualify the application. Each application must enter "MIA" in the upper lefthand corner of the face page, EPA Form 5770-4.
- Applicants must be citizens of the United States, or its possessions, the U.S. Virgin Islands or Puerto Rico.
- The Environmental Protection Agency reserves the right to limit the number of awards to a particular college or university.

For further information, please contact:

Walter H. Preston  
Ombudsman, MIA  
U.S. Environmental Protection Agency (RD-675)  
401 M Street, SW  
Washington, DC 20460  
(202) 382-7445

or

Clyde C. Bishop, Jr.  
Science Review Administrator

---

## ***Part II: Request for Applications***

### ***Announcement***

*REQUEST FOR APPLICATIONS: RFA # HR-01-87*  
*TITLE: Mechanisms of Immune Alterations Induced by*  
*Environmental Pollutants*  
*U.S. Environmental Protection Agency*  
*APPLICATION RECEIPT DATE: December 17, 1986*

#### ***I. BACKGROUND INFORMATION***

The Environmental Protection Agency (EPA) is responsible for protecting the human population from the potential toxic effects of pollutants. This responsibility is best achieved when the mechanism(s) underlying toxic effects are understood. There are a number of documented effects of environmental pollutants on the immune system in animals. There is a need to understand the mechanisms of these effects to better evaluate the potential human health risks resulting from exposure.

#### ***II. GOALS AND SCOPE***

The purpose of the RFA is to: investigate immunologic mechanisms (e.g., immunologic regulation, modulators, etc.) by which environmental xenobiotics (e.g., drugs, chemicals—benzene, etc.) alter the cellular and molecular aspects of the immune system of a host at risk.

A successful proposal will delineate the cellular and molecular mechanisms associated with alterations in immunocompetence/immunoregulation. Examples of areas that could be studied include:

- increased susceptibility to infectious agents,
- alterations in immunoregulatory circuits/factors,
- alteration of cellular and molecular functional components of specific and/or non-specific immunity,
- alteration in immune ontogeny,
- effects on differentiation of lymphoid cells.

A proposal submitted in any of the above areas will be considered equally responsive to this RFA.

#### ***III. MECHANISMS OF SUPPORT***

Assistance under this RFA will be through the U.S. Environmental Protection Agency's Research Grants Program, and thus limited to non-profit research organizations and educational institutions.

---

Responsibility for the planning, direction, and execution of the proposed research will be solely that of the applicant. It is estimated that approximately \$500,000 will be available from fiscal year 1987 funds for the first year of support. It is expected that approximately five proposals will be supported through these funds. The project period request for support should not exceed three years in duration. This RFA is for a single competition with a deadline of December 17, 1986, for receipt of applications.

#### *IV. REVIEW PROCEDURES AND CRITERIA*

##### **A. Review Procedures**

Applications in response to this solicitation will be reviewed together on a nationwide basis. The review will be conducted by a scientific peer panel which will evaluate and rank each proposal according to its scientific merit as a basis for recommending Agency approval or disapproval. The Panel will be composed primarily of non-EPA scientists who are acknowledged experts in the area.

##### **B. Review Criteria**

The applications will be evaluated using the following criteria:

- Quality of research plan (including theoretical and/or experimental design, originality, and creativity)
- Qualifications of principal investigator and staff including knowledge of subject area
- Potential contribution to scientific knowledge
- Availability and adequacy of facilities and equipment
- Budgetary justification

A written summary of the scientific review and recommendation by the Panel will be provided each applicant.

#### *V. METHOD OF APPLYING*

Application forms, instructions, and other pertinent information are contained in the EPA Research Grant Application/Information Kit. The kits are available from:

Research Grants Staff  
Office of Exploratory Research (RD-675)  
Office of Research and Development  
U.S. Environmental Protection Agency  
401 M Street, SW.  
Washington, DC 20460

---

The original and eight copies of the application must be received no later than close of business, December 17, 1986, to be considered. The applications should be sent to the above address for the attention of Dr. George R. Simon.

*VI. STAFF CONTACT*

Questions relating to this solicitation may be directed to Dr. George R. Simon, (above address) or telephone (202) 382-7445.

**Announcement**

*REQUEST FOR APPLICATIONS: RFA*

*TITLE: Effects of Air Pollutants on Forests*

*U.S. Environmental Protection Agency*

*APPLICATION RECEIPT DATE: January 9, 1987*

*I. BACKGROUND INFORMATION*

This RFA solicits research on the effects of atmospherically deposited ozone, hydrogen peroxide, metals, and organics on trees and forests.

Reports that atmospheric deposition was responsible for a widespread decline of forests in Europe, and recent reports of unexplained declines of forests in the U.S. are largely responsible for national concern regarding the possible effects of acidic deposition in this country. Considerable research is underway in EPA and elsewhere to determine the effects on forests of acid rain (atmospherically deposited sulfur and nitrogen). This RFA addresses areas not covered in the current research program.

*II. GOALS AND SCOPE*

Ozone concentrations are reported to cause foliar injury and suppress the growth of sensitive tree species, notably Ponderosa pine in southern California and eastern white pine in eastern North America. There are insufficient data, however, to define the nature, extent, and magnitude of O<sub>3</sub> effects on forests of the U.S. and to predict future effects if O<sub>3</sub> concentrations remain constant, increase, or decrease. Forests are exposed to other wet and dry atmospherically deposited pollutants including H<sub>2</sub>O<sub>2</sub>, metals, and organics that may be toxic at ambient concentrations. Research is encouraged to determine if ambient, or slightly elevated, concentrations of these compounds (ozone, hydrogen peroxide, metals, and organics), alone or in combination with other air pollutants, are toxic to forest vegetation. Research should be primarily at the physiological or predictive (modeling) level. For example, physiological and biochemical studies could be conducted to

---

determine the mechanisms by which any or all pollutants (O<sub>3</sub>, H<sub>2</sub>O<sub>2</sub>, metals, organics) influence plant performance. Studies could include rates of and factors affecting pollutant uptake, carbon acquisition and allocation, water use efficiency, and efficient nutrient acquisition and utilization. Research could address the physiological and ecological mechanisms underlying variation in pollutant effects as a function of species, genetics, and leaf and tree age. Studies could include research to determine the influence of climactic or edaphic factors on plant response to the atmospherically deposited pollutants as well as mechanisms whereby pollutants render plants more or less susceptible to environmental, edaphic, and biotic stresses. Information from the above types of studies may be used with or linked to physiological processes or tree models.

### *III. SPECIAL INSTRUCTIONS TO THE APPLICANTS*

Proposals should include:

1. Clearly stated hypotheses and relevant experimental questions.
2. Definition of data and analyses needed to scientifically evaluate the hypotheses and questions.
3. Estimated date that data would be available to EPA scientists in the form of a verified data base, operational model, and or in a draft report.
4. If appropriate, state the relationship of your proposed research with other ongoing, relevant research (especially EPA research on crops and forests). [For summaries of current forestry/crops research, contact Director, ERL-Corvallis, 200 S.W. 35th Street, Corvallis, OR 97333 or (503) 757-4600/4609].

### *IV. MECHANISMS OF SUPPORT*

Assistance under this RFA will be through the U.S. Environmental Protection Agency Research Grants Program, and thus limited to non-profit research organizations and educational institutions. Responsibility for the planning, direction, and execution of the proposed research will be solely that of the applicant. It is estimated that \$600,000 or more will be available from Fiscal Year 1987 funds for the first year of support. It is expected that approximately six proposals will be supported through these funds. The project period request for support should not exceed three years in duration. This RFA is for a single competition with a deadline of January 9, 1987, for receipt of applications.

---

## *V. REVIEW PROCEDURES AND CRITERIA*

### *—Review Procedures*

Applications in response to this solicitation will be reviewed together on a nationwide basis. The review will be conducted by a scientific peer panel which will evaluate and rank each proposal according to its scientific merit as a basis for recommending Agency approval or disapproval. The Panel will be composed primarily of non-EPA scientists who are acknowledged experts in the area.

### *—Review Criteria*

The applications will be evaluated using the following criteria:

- Quality of research plan (including theoretical and/or experimental design, originality, and creativity)
- Qualifications of principal investigator and staff including knowledge of subject area
- Potential contributions to scientific knowledge
- Availability and adequacy of facilities and equipment
- Budgetary justification

A written summary of the scientific review and recommendations by the Panel will be provided each applicant.

## *VI. METHOD OF APPLYING*

Applications forms, instructions, and other pertinent information are contained in the EPA Research Grant Application/Information Kit. The kits are available from:

Research Grants Staff  
Office of Exploratory Research (RD-675)  
Office of Research and Development  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

The original and eight copies of the application must be received no later than close of business, January 9, 1987, to be considered. The applications should be sent to the above address for the attention of

Dr. Louis Swaby.

## *VII. STAFF CONTACT*

Questions relating to this solicitation may be directed to Dr. Louis Swaby (above address) or telephone (202) 382-7445.

---

**Appendix A:** Laboratories of The Office of Research and Development, USEPA

Health Effects Research Laboratory  
Research Triangle Park, NC 27711  
(919) 541-2281

Environmental Monitoring Systems Laboratory  
P.O. Box 15027  
Las Vegas, NV 89114  
(702) 798-2100

Water Engineering Research Laboratory  
Cincinnati, OH 45268  
(513) 569-7951

Environmental Research Laboratory  
South Ferry Road  
Narragansett, RI 02882  
(401) 789-1071

Environmental Monitoring Systems Laboratory  
Research Triangle Park, NC 27711  
(919) 541-2106

Environmental Research Laboratory  
Sabine Island  
Gulf Breeze, FL 32561  
(904) 932-5311

Hazardous Waste Engineering Research Laboratory  
Cincinnati, OH 45268  
(513) 569-7418

Environmental Monitoring and Support Laboratory  
Cincinnati, OH 45268  
(513) 569-7301

Environmental Research Laboratory  
200 SW 35th Street  
Corvallis, OR 97333  
(503) 757-4601

Environmental Research Laboratory  
College Station Road  
Athens, GA 30613  
(404) 546-3154

Environmental Research Laboratory  
6201 Congdon Boulevard  
Duluth, MN 55804  
(218) 727-6692

Atmospheric Sciences Research Laboratory  
Research Triangle Park, NC 27711  
(919) 541-2191

---

Air and Energy Engineering Research Laboratory  
Research Triangle Park, NC 27711  
(919) 541-2821

Robert S. Kerr Environmental Research Laboratory  
P.O. Box 1198  
Ada, OK 74820  
(405) 332-8800



United States  
Environmental Protection  
Agency

Center for Environmental Research  
Information  
Cincinnati OH 45268

---

Please make all necessary changes on the above label,  
detach or copy, and return to the address in the upper  
left-hand corner

If you do not wish to receive these reports CHECK HERE ,  
detach, or copy this cover, and return to the address in the  
upper left-hand corner

"The Administrator of EPA has determined  
that the publication of this periodical is  
necessary in the transaction of the public  
business required by law of this Agency.  
Use of funds for printing this periodical has  
been approved by the Director of the Office  
of Management and Budget through April  
1, 1987 "