

NIH GUIDE

for GRANTS and CONTRACTS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Vol. 3, No. 19, November 19, 1974

HEALTH RESEARCH RELATED TO

ENERGY PRODUCTION AND CONSERVATION

ANNOUNCEMENT

The National Institute of Environmental Health Sciences invites grant applications for research designed to elucidate and predict the health effects of pollutants and other potentially hazardous by-products associated with the various energy technologies and conservation proposals being developed in response to the nation's drive toward energy self-sufficiency. Approved projects will be supported with funds expected to be appropriated and made available to the Institute by early 1975.

Because of the potentially adverse human health effects of intensified activities in energy production, broad investigations of damage, repair and recovery mechanisms in biological systems, and development of reliable test models are required to provide a basis for the parallel development of emission controls and protective and remedial therapies for the human population.

The overall objectives of the Institute's research programs related to the health effects of energy are to (1) determine the qualitative and quantitative effects of energy-related hazardous agents on human health, from resource recovery and processing to energy utilization and conservation; and (2) elucidate the basic mechanisms of the observed effects.

Priorities of the program take into account the suspected health impacts of hazardous agents from the proposed energy technologies on the general population and on specific population groups, gaps in our knowledge concerning health effects, and projected time frames for development and implementation of the energy technologies.

The Institute's concern with hazardous agents associated with energy production and conservation includes, but is not limited to, (a) native components of coal and petroleum; (b) gaseous and solid by-products of combustion, including oxides (and their hydrates) of sulfur, nitrogen, and heavy metals; (c) vapors and compounds of heavy metals contained in fossil fuels, used as catalysts, or emanating from energy-related activities and production processes; and (d) industrial dusts and fly ash, particularly those originating from fossil fuel burning, mining, and production and use of asbestos, rockwool, plastics, fiberglass, etc.

The GUIDE is published at irregular intervals to provide policy, program, and administrative information to individuals and organizations who need to be kept informed of requirements and changes in grants and contracts activities administered by the National Institutes of Health.

Priority areas of investigation pertinent to this announcement are:

1. Development of more sensitive and rapid physiological indicators to evaluate damage to man. The major need in the area of toxicity testing is for methods which are less time consuming, complex and costly. The focus should be on tests designed to identify and quantify a wide variety of agents with respect to carcinogenic, mutagenic or teratogenic properties. Batteries of tests utilizing present techniques such as Drosophila test systems, the host mediated assay, cultured cell transformations, radiation sensitive mutants, and protein and enzyme changes may be useful as first tier mutagenesis tests. New embryonic culture techniques may be applicable for comparing the degree and type of teratogenic change. However, development of new tests which will facilitate translation of results from these test systems to man are encouraged. Such tests include direct indicators from man in readily available fluid and cellular fractions of biopsy and surgical specimens, umbilical cord blood, amniotic fluid, lung and body cavity lavages, semen, blood, lymph and urine.
2. Determination of mechanisms of incorporation, metabolism, deposition and turn-over of hazardous agents. The focus of these studies should be on mechanisms of action and sites of localization and transfer of combustion gases, particles, heavy metals, and hydrocarbons in isolated perfused lungs, in experimental animals and in man. In addition, similar studies are encouraged on placental and blood-brain transfer, fetal accumulation and associated effects on fetal and postpartum development.
3. Determination of the relationship of metabolism and fate and the toxicology of energy-related particulates and organic compounds. Physical models, cultured cells, laboratory animals and human subjects may be used as appropriate for each of the studies. Design of the experiments should be aimed at elucidation of mechanisms of molecular, cellular and tissue changes resulting in covert and overt diseases. Such changes should be related to the physical and chemical properties of inhaled compounds and particles and quantified with respect to exposure and sites of deposition.
4. Quantification of relationships between exposure to hazardous agents and diverse behavioral, physiological and mutagenic effects. Of particular interest are (a) quantitative relationships in behavioral changes, and their mechanisms, which result from damage to the nervous system and structural and functional incapacitation of the cardiovascular and pulmonary systems. These disorders should be defined in terms of threshold doses required to produce symptoms which may be early indicators of damage. It is important also to develop information about alteration in these relationships due to synergistic actions of combined agents and by environmental stresses imposed by energy conservation regimes in relation to age, sex and current or antecedent disease; and (b) quantitative relationships in mutagenesis. These studies should be designed to facilitate unequivocal correlation of mutations in non-human test systems to determine time-dose relations and to evaluate synergism among combinations of agents.
5. Development of test models and concepts for extrapolation of cellular and animal data to man. Research should be directed toward (a) development and analysis of mathematical and statistical models for dose-response relationships in laboratory animals to provide predictive capability with respect to human risk based on low-dose extrapolation, and (b) development of theoretical models for determining quantitatively the absorbed dose of radiation and for predicting potentiation of radiation and chemical effects.

6. Identification of damage to cells and cell components as early indicators of injury in order to identify susceptible population groups and guide remedial and protective therapies. The research should focus on the mechanistic details and time sequence of cellular events that will eventually result in recognizable diseases and end points. Studies should involve a broad range of organs, body functions and cells. Additionally, the studies should clarify the interactions through which chemical and physical agents associated with energy production and conservation, singly and in combination, play secondary or ancillary roles in the progress of cellular changes leading to degenerative diseases.

Applications should be submitted on PHS Form 398 to the Division of Research Grants, National Institutes of Health, Westwood Building, Bethesda, Maryland 20014. These are described in the green sheet which accompanies Form 398 in the NIH Application Kit.

For further information please contact: Dr. Robert G. Owens, Extramural Programs, National Institute of Environmental Health Sciences, National Institutes of Health, Post Office Box 12233, Research Triangle Park, North Carolina 27709.
Telephone: (919) 549-8411, extension 3358.

SENIOR INTERNATIONAL FELLOWSHIPS

FOGARTY INTERNATIONAL CENTER

ANNOUNCEMENT

The International Research Exchange Program provides opportunities to outstanding faculty members at mid-career from U.S. schools of medicine, osteopathy, dentistry and public health with demonstrated productive scholarship and recognized stature in their profession to go abroad to study and share their expertise. It is intended that this award be a career-enhancing educational experience with mutual benefits to all involved. These fellowships are intended to:

1. increase the interchange of ideas of mutual interest between U.S. scholars in academic medicine and those of other nations of the world,
2. permit the exchange of the latest advances in a particular area of medicine, both basic and clinical,
3. permit participation in the contribution to on-going research in the medical sciences or in science areas related to medicine, and
4. improve the academic, research and/or clinical biomedical potential of the U.S. medical institution.

Eligibility Requirements To be eligible for a Senior International Fellowship, the nominee must:

1. be a U.S. citizen,
2. hold a full-time appointment on the staff of the nominating institution,
3. have at least five years' experience beyond the doctorate or professional medical degree in research, teaching, or other relevant professional work,
4. possess the linguistic abilities necessary for learning and for profitable discussion with colleagues in the country proposed for training.

Nominations The nomination of an individual for this fellowship will be made by the U.S. institution. The application will require the endorsement of the President or other appropriate official of the nominating institution, and shall specify the expected benefits to the institution of the applicant's proposed program. Additional information may be submitted by the institution in support of the nomination as it considers pertinent. A letter of invitation from an appropriate individual at the host institution abroad attesting to the willingness of the institution to sponsor the applicant and outlining any benefits which may accrue will be a necessary part of the application. In addition, letters of recommendation from colleagues or others who are acquainted with the individual's scientific competence will be solicited by the applicant. The nominee will be judged on these evidences of academic competence and on ability to pursue the proposed program.

Documents to be Submitted The applicant must submit a research fellowship application and in addition, arrange for the submission of supporting documents on his behalf (reference reports, letter of invitation from host institution, etc.).

Application Material Individuals are encouraged to review the eligibility criteria before requesting application kits from the Office of Research Manpower, Division of Research Grants, National Institutes of Health, Bethesda, Maryland 20014.

Deadlines for Receipt of Applications

| Applications received by: | Results announced by the following: |
|---------------------------|-------------------------------------|
| January 15 | June |
| May 1 | November |

Applications received after one deadline are considered at the next review.

Stipends and Allowances

Stipends will be determined individually by the Fogarty International Center, based upon such factors as current salary and any proposed financial contributions and participation by the nominating institution. The government agency contribution may not exceed \$25,000 for a 12-month period.

Allowances No allowance will be provided for dependents, domestic travel or shipment of household effects. A round-trip travel allowance from the nominating institution to the foreign host institution of 8¢ per air mile when U.S.-flag carriers are used for (1) departure from or entry into the United States and for (2) any other portion of the trip where U.S. carriers are available. When U.S. carriers are unavailable for any portion of the trip, the NIH awarding unit should be notified.

An unaccompanied baggage allowance for personal effects not to exceed 100 pounds to be shipped air freight may be authorized.

Upon justified request, the Fogarty International Center will provide funds not to exceed \$2,000 per 12-month period to the foreign host institution to help defray such expenses as fees, research supplies and equipment.

Tenure Applicants may request support for a United States academic year to a maximum of 12 months. Under special circumstances, upon demonstration that a shorter period would be sufficient to accomplish the fellowship purposes, it may be possible to receive an award for a period of 3-6 months.

Selection of Awardees Nominations will be reviewed by NIH review committees. Individuals selected will represent a broad spectrum of interests but will be representative of current needs, interests and potentials for meaningful exchanges.

Notification of Final Action An applicant will be notified by the Director, Fogarty International Center, of the final action on his application by an award notice or by a letter.

Activation Date An awardee may activate his fellowship at any time during the 12-month period following the date of the award notice.

Conditions of Award A complete and definitive report of the year's assignment including accomplishments, recommendations and evaluation of the supported activity must be submitted by the awardee. If possible, a report by both the receiving institution and the U.S. institution will be obtained.

Fellows are not entitled to prolonged vacations, although those at academic institutions may take the holidays occurring at Christmas, Easter, etc., and the short period between semesters or quarters. Those at nonacademic institutions are entitled to the normal holiday periods of the institution.

Taxability of Stipends Determination of the Federal tax status of an individual receiving compensation in any form from an NIH award is the responsibility of the Internal Revenue Service. States and municipalities have varying tax laws. No deductions are made from stipends for any purpose such as income tax or social security.

This supersedes the announcement contained in *NIH GUIDE*, Vol. 3, No. 16, p. 3, October 18, 1974.

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