

MEDICINE

EDUCATION

HOWARD HUGHES MEDICAL INSTITUTE

MED INTO GRAD INITIATIVE

Integrating Medical Knowledge into Graduate Education

Program Announcement

2006

RESEARCH

HEALTH

PATHOBIOLOGY

COLLABORATION

Register intent to apply by April 20, 2005
Proposal submission deadline: September 8, 2005
Awards announcement: February 2006

HHMI
HOWARD HUGHES MEDICAL INSTITUTE
Graduate Science Education Program

MED INTO GRAD INITIATIVE

This initiative will award grants to institutions to improve the understanding of medicine and pathobiology by scientists conducting biomedical research. Grants will be used to modify existing graduate training or initiate new programs to develop a cadre of Ph.D. researchers who understand pathophysiology and are committed to working at the interface of the basic sciences and clinical medicine.

Applications will be accepted from any university in the United States that offers Ph.D.-level training in an appropriate science or engineering discipline. It is expected that as much as \$10 million will be awarded in this competition. Awards will range from \$400,000 to \$1 million, and the grant funds will be allocated over four consecutive years. No further competition is expected for at least four years if grant awards totaling \$10 million are made in this competition cycle.

This program announcement describes the goals, eligibility criteria, electronic proposal submission guidelines, and criteria by which proposals will be reviewed.

Applicants should access HHMI's online competition system at www.hhmi.org/grants/gcs to obtain detailed information on this competition, register their intent to apply, access the online application materials, and submit applications. The login ID is guest, and the password is register.

BACKGROUND AND GOALS

Although medical science is primarily based on human biology, a gap has been growing between basic biology and medicine. As knowledge in molecular genetics and cell biology accelerates, the biomedical community is finding it increasingly hard to harness the explosion of new information and translate it into medical practice. In addition, new approaches, such as genomics and proteomics, have created new opportunities for understanding medically relevant biology. Thus, while an understanding of the biology of humans and their pathogens has grown, little of that knowledge has been translated into applications for the treatment of disease.

The gap has been driven by factors in both the basic science and the clinical communities. The increasing complexity and sophistication of contemporary biology have diverted training and focus in basic science away from applied aspects of medical research. At the same time, recent increases in clinical demands on physicians, the growth of medical technologies, and the divergence of medical training away from the mainstream of biological investigation have presented barriers to the involvement of physicians in integrating advanced biological concepts for the treatment of disease. In short, Ph.D. biomedical scientists have little medical

training or experience, and the number of basic-science-oriented physician-scientists is inadequate. HHMI is addressing this issue from the training perspective with two complementary strategies: ongoing programs for support of medical students to become involved in research (for more information, see www.hhmi.org/grants/individuals) and this new program aimed at incorporating aspects of medical training into Ph.D. graduate training.

The goal of this initiative is to develop an understanding of pathobiological and medical principles by tomorrow's Ph.D. biomedical researchers. This new cadre of investigators will appreciate which biological problems are of the greatest clinical relevance and will have the knowledge and skills necessary to facilitate the movement of new biological knowledge to tools for improved human health. The intent is that they will be able to create fruitful working partnerships with physicians.

ELIGIBLE INSTITUTIONS

All U.S. institutions that grant Ph.D. degrees in appropriate science or engineering disciplines are eligible to apply for support through this initiative. An institution may submit up to two applications for funding. However, no

more than one program will be funded at any one institution. Applications must be coordinated by the administration of the applicant institution to ensure that no more than two proposals are submitted. Designations must be made at the level of the institution's president. Affiliation with a medical training facility is required, either within the applicant's own university or by agreement with another institution. If more than one proposal is submitted, the applications should not overlap, they should have different program directors, and they must have the written support of the institution's leadership.

PROGRAM DEVELOPMENT AREAS

HHMI seeks to fund innovative, sustainable, and effective approaches for integrating an understanding of medicine and pathobiology into graduate study. We recognize that there are many ways to accomplish this goal and that the projects will vary in effort and cost. Although we have no specific plan in mind, the following examples of approaches might be helpful for applicants:

- Institutions with existing programs may seek to modify and enhance a current training program by establishing new courses that are designed for graduate students or shared with medical students and are coupled with clinical experiential learning or physician-scientist mentoring. While significant curricular and cultural change may be required to implement this type of intervention, it is expected that the funding required will be significantly less than some other approaches.
- A more expansive effort might be to create a new supplemental program leading to a certificate, master's degree, or other appropriate academic designation. Such programs could recognize the attainment of knowledge and skills needed to move biological knowledge to clinical application. Some areas of knowledge and skills that might be considered relevant are pathobiology, clinical experimental design, digital data collection and management, statistical and computational analysis, research with animals and human tissues, and ethics and regulation of human research. Such a program would also likely include learning in the clinical environment.

- Another approach might be to provide and support a portion of a graduate student's training experience in a medically relevant research environment. Trainees could move into a specialized portion of the curriculum to gain the particular skills and knowledge and then return to a more standard academic training curriculum.
- The effort requiring the most resources would likely be new graduate programs designed to train biomedical scientists who are particularly prepared to work at the interface of bioscience and medicine. This would require recruiting faculty, establishing new curricula, developing new medically related science courses, providing unique experiential medical training, and selecting and supporting students.

We seek creative and cost-effective solutions to this training challenge and wish to support curricular elements that can be disseminated throughout the biomedical research training community. Although we believe that opportunities to change careers should be protected, it is not the purpose of this initiative to support programs that facilitate the movement of biomedical Ph.D. students or recipients into medical study. Conversely, we do not expect to fund programs to move medical students into biomedical science graduate study.

FUNDABLE ACTIVITIES

Fundable activities include, but are not limited to, the following: planning, development, and initiation of medical-research and clinically relevant courses; development and implementation of clinical mentor programs for graduate students; clinical learning activities; and medical seminar programs for biomedical science students. Funds may also be used to support travel by relevant invited speakers, travel by students to medical research meetings, and modest reimbursement of departmental expenses related to student involvement in clinical activities. Recruitment, student stipends, tuition, fees, and health insurance may be supported.

PROGRAM ADMINISTRATION

Academic administration is important for the success of any graduate program. Up to 10 percent of the award may be budgeted for direct program administration. Appropriate charges include office support, development and distribution of recruitment materials, and limited administrative travel. In addition, facilities and administration costs of 8 percent of modified costs may be charged to this grant but must be taken from the award amount.

A detailed plan should be provided that describes how grant funds will be distributed across specific program elements. Note that support for the program director(s) and other members of the leadership team should be delineated under the program leadership component rather than included in the program administration category. Department faculty participating in the program who are not members of the leadership team should be delineated under the faculty component.

PROGRAM ASSESSMENT

Each project should develop an internal evaluation plan to assess the progress of the program and problems being experienced. This self-evaluation should be used to improve program activities. It is also important that the proposal provide a longitudinal assessment plan that will follow trainees after graduation to determine whether the project was successful in accomplishing its goals. Applicant institutions must agree to cooperate in the collection of appropriate data and to provide it to HHMI for evaluation of the funding effort.

HHMI will monitor and evaluate the overall initiative with the expectation that other institutions will use successful strategies and curricular elements in future implementation of similar training programs. As a result, we expect that all funded programs will participate in annual program directors meetings sponsored by HHMI, share successful program elements, collectively address common challenges, and test potentially useful educational interventions.

ELECTRONIC PROPOSAL SUBMISSION AND DEADLINES

Registration

Applicants must register their intent to submit a proposal by 2:00 p.m. ET, April 20, 2005, via HHMI's Web-based competition system at www.hhmi.org/grants/gcs. There is no limit to the number of interested parties from any one university who register an intention to apply. However, institutions may serve as the primary institution on only two submitted proposals. If there are multiple registrants per institution, HHMI will notify the institution's president. It is the responsibility of the president to designate to HHMI the two proposals (not necessarily registrants) that will be submitted in the competition. HHMI will notify the designees as well as the other registrants of the president's decision as soon as it is made known to HHMI. Designees will then be able to enter the system and submit proposals.

We urge institutions to register their intent to apply as early as possible in the proposal planning process. Important information regarding the application process will be sent to those who are registered.

Proposal Submission

The deadline for submitting proposals (via the competition system at www.hhmi.org/grants/gcs) and supporting materials is 2:00 p.m. ET, September 8, 2005. Application materials, instructions, contact information, and this program announcement can also be found on the competition system website.

Although two proposals may be submitted, HHMI will fund no more than one primary program from any one institution. There is no limit to the number of meaningful collaborations in which an institution may participate. Agreements to collaborate and written commitments to the program by the institutions should be provided as a part of the proposal.

Technical assistance for the electronic proposal-submission process is available at a toll-free number listed on the competition website.

Award Notification

Successful applicants will be notified in February 2006. Grant payments will be made in annual installments starting in March 2006. Grant terms will start in April 2006.

APPLICATION GUIDELINES

All uploaded documents must be double spaced and in 12-point type.

Executive Summary

Not to exceed 3 pages.

The proposal should begin with an executive summary, which will be used frequently throughout the review process. The summary should include a brief description of the goals of the project and how they will be achieved.

Proposal Narrative

Not to exceed 20 pages.

Introduction. Begin the narrative with a brief description of the specific aims and major components of the proposal. Describe the need for support of the major components of the proposed activities and the strategy for their implementation. Provide an institutional and departmental context for the proposed activities, discussing how they are part of any long-term plans the applicant institution has for graduate science education.

Proposed Program Activities. Give specifics on proposed activities. Briefly describe the leadership team of the program, emphasizing their commitment and qualifications to take on the proposed project. Include background on faculty participation and provide background on the applicant institution's capacity or experience for carrying out the proposed activities. Describe the administrative and teaching space and facilities available for the proposed program, as well as the arrangements that have been made for any clinical learning opportunities that may be proposed. This section should also include a description of how you plan to take advantage of the environment and faculty. Describe expected program outcomes and discuss how the proposed activities will accomplish the proposed specific aims. Describe the specific impact the proposed project will have on the education of

students at your institution(s) and how it could impact graduate science education if implemented nationally. Describe the steps you will take to ensure that those parts of the program that are successful will continue at your institution.

Program Assessment. Describe how you will assess the success of the proposed program. Evaluation of HHMI-sponsored projects is seen as an essential part of every proposal. Each project should carefully plan internal evaluation to elucidate the progress and problems being experienced.

Institutional Information

Enter the data in the form provided.

Provide the requested institutional data, including annual budget, endowment, amount of sponsored research, number of students (graduate, undergraduate, underrepresented minorities, and women for each category), number of faculty (tenured, nontenured, underrepresented minorities, and women for each category).

Department and Program Profiles

Not to exceed two pages.

Provide the appropriate information to convince the reviewers that the opportunity exists to impact training in the biomedical sciences at your institution. Provide the history and administrative organization of the relevant graduate departments and programs, as well as of the relevant research programs. Also include how the proposed activities will integrate with existing programs or research emphases. The barriers to the implementation of the new program elements should be listed and the plans to overcome these barriers described.

Designation of Program Director(s) and Other Relevant Faculty

Enter the data in the form provided.

List the designated primary program director, any co-directors, and all relevant faculty and professional personnel, along with their associated roles. Submit a two-page biographical sketch or curriculum vitae each for the primary program director, co-director(s), and up to 10 of the other faculty participants listed. Include research and educational funding, source and amount of funding, title of the project, percent time, and the role of the person on the project.

Description of Students

Provide aggregate academic characteristics of graduate students in the relevant departments or programs. Appropriate data include undergraduate majors, GPAs, and undergraduate institution names. Admission statistics such as the number of applications, acceptances, and matriculations may be useful to demonstrate the quality of the student body and impact of the proposed program. Discuss your plans to attract participation in your program(s) by those currently underrepresented in this area.

Budget and Budget Narrative

Use the forms provided.

Budgets should be prepared carefully and thoughtfully. It is expected that most projects will require much less than the maximum grant amount allowed. The reasonableness of the budget will be a factor in evaluating the merit of the application. Make sure that any significant budgeted expenditure is carefully justified.

- Any equipment and renovation costs must be justified. It should be remembered that the grant is given to support graduate education, not research or medical education.
- If student support is requested, the amount paid from HHMI funds for stipend, tuition, health insurance, and fees may not exceed that which would be paid by an NIH National Research Service Award. No additional institutional support will be paid by HHMI.
- For each budget year, describe how the applicant institution will make a significant contribution to the program. Facilities and administration (F&A) costs of 8 percent of modified costs may be charged to this grant but must be taken from the award amount. If institutional F&A rates are greater than 8 percent, the difference between that rate and 8 percent may *not* be considered an institutional contribution for the purposes of this grant.
- No more than 10 percent of the grant may be budgeted annually for academic program administration.

Letters of Support and Institutional Commitment

Each applicant must submit a letter from the dean or other appropriate official detailing the institution's support of this application. The letter must address the current and future institutional commitment. The applicant may also include letters from collaborating institutions. To be effective, these letters should detail the commitment that the collaborating institution will make to ensure the success of the proposed project.

PROPOSAL EVALUATION

An external review panel of scientists and educators will be convened to review the proposals. Proposals will be evaluated on how well they address the goals of this initiative and the following criteria:

- Innovation, imagination, and vision of the proposed project.
- Perceived impact of the proposed project within and outside the institution.
- Commitment of the institution(s), departments, and academic units to the immediate success of the project and the continuation of successful elements of the project after HHMI funding has ended.
- Resources available that ensure success of the program, including synergy with other programs and institutions, qualifications of the project director and team, and quality and characteristics of the students.
- Appropriateness of milestones and timeline for implementation.
- Quality of the program-assessment plan.
- Appropriateness of the budget.
- The strategy for increasing the diversity of participating students.

REPORTING REQUIREMENTS

Grantee institutions will be required to submit annual progress reports of their program activities and annual financial reports, as well as results of assessment of their programs. Institutions are encouraged to collaborate, as are units within institutions; however, the fiscal and reporting responsibilities must reside within a single institution and academic unit. HHMI funds will be provided to a single reporting unit, and any further disbursement of resources must be made through that unit.

INFORMATION

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HOWARD HUGHES MEDICAL INSTITUTE

The Howard Hughes Medical Institute is a medical research organization dedicated to biomedical research and education. Its principal objectives are the advancement of fundamental knowledge in the biomedical sciences and the application of that knowledge to alleviate disease and promote health.

Through its grants and special programs, HHMI seeks to strengthen science education and biomedical research by supporting current and future leaders to advance scientific knowledge, develop educational products, and implement outstanding educational practices.