

HOWARD HUGHES MEDICAL INSTITUTE

HHMI PROFESSORS 2006

A program designed to stimulate personalized undergraduate education by accomplished research scientists

Revised April 20, 2005

Electronic registration deadline: March 15, 2005

Nomination deadline: May 2, 2005

Proposal deadline: September 7, 2005

Awards announcement: May 2006

HHMI
HOWARD HUGHES MEDICAL INSTITUTE
Undergraduate Science Education Program

HOWARD HUGHES MEDICAL INSTITUTE

www.hhmi.org

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.

2006 HHMI PROFESSORS COMPETITION

The 2006 HHMI professors competition is HHMI's second undergraduate grants competition intended to stimulate, support, and empower accomplished research scientists in conveying the excitement and values of scientific research to undergraduate education and to apply their innovations to advancing science education. Additional goals of the program are to introduce graduate students and postdoctoral fellows to the challenges and rewards of mentoring undergraduates and to develop a cadre of scientist-educators around the country who are leaders in research and excel in undergraduate teaching. Faculty in the biological, biochemical, bioinformatics, and biomedical sciences are eligible, as well as those in subfields of physics, chemistry, and engineering that relate to the biomedical sciences.

In 2002, HHMI launched the professors program by awarding four-year grants of \$1 million each to 20 scientist-educators to foster innovations in undergraduate science education at the professors' home universities and provide other institutions with effective models for bridging research and teaching. The HHMI professors have used their grants to develop a variety of compelling projects to energize undergraduate education and offer students new opportunities to learn modern biology in laboratory settings similar to those of research scientists. In some cases, professors have included graduate students and precollege teachers and students in their activities and extended the benefits of their programs to wider constituencies. In addition, a number of professors have leveraged their HHMI support by attracting new funds from their institutions and external sources, commitments of laboratory space and equipment, and other contributions.

HHMI will continue to encourage the exchange and broad dissemination of ideas and best practices developed through its professors program. HHMI professors meet with their fellow professors and with directors of HHMI-supported undergraduate programs, and they participate in scientific meetings of HHMI investigators appropriate to their disciplines.

ELIGIBILITY CRITERIA AND NOMINATIONS

The 2006 HHMI professors competition is open to individuals at 100 institutions classified in 2000 by the Carnegie Foundation for the Advancement of Teaching as doctoral or research universities (extensive and intensive). The institutions invited to participate have proven records in preparing students for graduate education in science and careers in science research and medicine. (See Appendix A for the list of invited institutions.)

Each invited institution may nominate up to two faculty members to compete for HHMI professor awards. The focus of this competition will be primarily on tenured faculty members with established research and educational programs in the biological sciences who are prepared to significantly expand their undergraduate educational activities. HHMI already supports independent undergraduate research opportunities through its Undergraduate Science Education Program; HHMI professors are expected to be involved in education at a level beyond engaging a few undergraduates in independent projects in their research laboratories.

Note: Professor appointees will be encouraged to interact with HHMI investigators, but HHMI investigators will be ineligible to compete for awards in this program. HHMI professors who received awards in 2002 will be invited to submit applications for grant renewals in a separate competition, but they are ineligible for nomination in this 2006 competition. Application materials for grant renewals will be provided directly to the 2002 HHMI professors by HHMI staff.

PROGRAM ACTIVITIES

HHMI encourages applicants to propose new ideas for undergraduate teaching that build on the research strengths and interests of their laboratories. The following are only some examples of possible activities that could be funded:

- Developing innovative, hands-on introductory-level science courses for science and nonscience majors and students at the earliest stages of their academic careers.
- Creating or expanding laboratory courses for undergraduates at any level based on the HHMI professor's research. These courses might use wet labs or computer-assisted dry labs to offer open-ended, hands-on research, including important emerging areas such as genomics, bioinformatics, and imaging.
- Developing new ways to teach contemporary biology in a variety of settings, including but not limited to undergraduate courses for science and nonscience majors.
- Establishing mentoring programs and initiatives to broaden access to science for all students, especially underrepresented minorities and students from disadvantaged backgrounds.
- Creating research teams in the professor's laboratory composed of groups of undergraduates, including women and underrepresented minorities, along with existing lab members (graduate students, postdoctoral fellows, senior scientists) to steep undergraduates in the culture of science and encourage scientific creativity, presentation skills, and publication.
- Collaborating with faculty members from other fields (for example, physical and computer sciences) in the development of interdisciplinary course content and approaches.
- Strengthening the quantitative skills of biology students.

- Initiating activities to prepare graduate students and postdoctoral fellows for their future role as teachers, as well as scientists, by working directly with undergraduates in research and teaching settings, developing course materials, serving as mentors, and engaging in other educational activities while continuing their research.
- Designing and implementing methods to disseminate the approaches, curricula, and materials that have been developed to make them broadly available to the research and science education community (for example, by organizing or participating in workshops, presenting seminars or publishing useful materials in print or electronically).
- Establishing precollege and other outreach initiatives at the community college, secondary, or primary school levels.

Budgets will not be submitted with the proposals from nominees but will be developed with HHMI staff after the awards have been announced. Allowable expenses may include, but are not limited to, the following:

- Summer salary for HHMI professors and collaborators
- Support for graduate students and postdoctoral fellows
- Undergraduate research stipends
- Equipment and supplies
- Technical support
- Travel

Grants may not support endowment or major capital projects, particularly the construction of new facilities. In rare instances, the awards might be used to support laboratory renovations in the initial year of the program, but these expenses must be well justified. Up to 8 percent of the total award may be applied to indirect costs.

PROPOSAL EVALUATION CRITERIA

A panel of distinguished scientists and educators and HHMI staff will review the proposals. On the basis of the review, staff will make recommendations to the Trustees and president of HHMI. The criteria by which proposals will be evaluated include:

- Impact of the proposed program in enriching undergraduate science education and involving increased numbers of undergraduates in research or other open-ended, inquiry-based activities.
- Originality of the proposed program and likelihood it will achieve the stated objectives.
- Appropriateness of the proposed activities for the intended groups (for example, undergraduates, graduate students, precollege participants).
- Potential of the proposed program for attracting and retaining students interested in science, including science and nonscience majors, women, and underrepresented minority students.
- Quality of the applicant's research and educational accomplishments.
- Strength and enthusiasm of support letters.
- Evidence of support by the applicant's institution and potential for sustaining activities beyond the grant.
- Potential for the program to serve as a model in other settings.

PROPOSAL REQUIREMENTS

The proposal must not exceed 10 single-spaced pages and must include the following:

- A one-page executive summary briefly describing the proposed project(s), targeted groups, number of participants, and anticipated outcomes.
- A one-page summary of the applicant's research accomplishments and contributions to his or her scientific discipline.

- A one-page summary of the applicant's accomplishments in undergraduate education.
- A five- to seven-page plan for the four-year project. It should include the applicant's vision and objectives for the proposed initiative; a statement about why the applicant is seeking this grant and how it would change his or her activities; specifics about the individuals who would be involved in the program (for example, faculty members, postdoctoral fellows, graduate students, technicians); the targeted groups (for example, undergraduates and precollege teachers and students); activities that would be undertaken; expected outcomes and products; and assessment and dissemination activities.
- One letter from a senior administrator of the applicant's institution (dean, provost, president) setting forth the applicant's qualifications and the institutional context for and commitment to the proposed activities. *The letter can be submitted by the applicant using the online system or mailed in hard copy (original preferred) to HHMI.*
- One letter from a faculty colleague familiar with the applicant's research activities and experience in undergraduate education. *This letter should be submitted online by the reference using the login and instructions, which will be provided by HHMI. The applicant must provide contact information for the faculty colleague.*
- Three letters from former undergraduates attesting to the applicant's commitment to and effectiveness in undergraduate education. *These letters should be submitted online by each reference using the login and instructions, which will be provided by HHMI. The applicant must provide contact information for each student.*
- The proposal should include an up-to-date curriculum vitae (up to 20 pages) covering the applicant's educational and research training background, professional history, teaching and research activities, awards, publications, and other relevant information.

AWARDS AND SCHEDULE

Awards of \$1 million each will be provided over a four-year period to up to 20 individuals. Budgets will be developed after the awards have been made and the professors have met as a group with HHMI program staff before the start of their programs to discuss programmatic and budgetary issues. HHMI will be flexible in allowing professors to adjust their programs over the term of their awards.

The key dates for the 2006 HHMI professors competition are as follows:

March 15, 2005: Deadline for electronic registration

May 2, 2005: Deadline for electronic submission of nominations from invited institutions

September 7, 2005 (5:00 p.m. ET): Deadline for electronic and hard-copy submission of proposals from individual nominees

May 2006: Awards announcement

September 2006: Initial award payment

October 2006: Initial professors meeting

INFORMATION

Call Maria Koszalka, senior program officer, or Stephen Barkanic, program director, at 301-215-8872 with any inquiries regarding this program, or send an e-mail message to profcomp@hhmi.org.

APPENDIX A

2006 HHMI PROFESSORS COMPETITION: INVITED INSTITUTIONS

Andrews University <i>Berrien Springs, Michigan</i>	Loyola University of Chicago <i>Chicago, Illinois</i>	University of Arizona <i>Tucson, Arizona</i>	University of Nebraska–Lincoln <i>Lincoln, Nebraska</i>
Baylor University <i>Waco, Texas</i>	Marquette University <i>Milwaukee, Wisconsin</i>	University of Arkansas <i>Fayetteville, Arkansas</i>	University of Nevada–Reno <i>Reno, Nevada</i>
Boston College <i>Chestnut Hill, Massachusetts</i>	Massachusetts Institute of Technology <i>Cambridge, Massachusetts</i>	University of California–Berkeley <i>Berkeley, California</i>	University of North Carolina at Chapel Hill <i>Chapel Hill, North Carolina</i>
Boston University <i>Boston, Massachusetts</i>	Miami University <i>Oxford, Ohio</i>	University of California–Davis <i>Davis, California</i>	University of Notre Dame <i>Notre Dame, Indiana</i>
Brandeis University <i>Walham, Massachusetts</i>	Michigan State University <i>Lansing, Michigan</i>	University of California–Irvine <i>Irvine, California</i>	University of Oklahoma <i>Norman, Oklahoma</i>
Brigham Young University <i>Provo, Utah</i>	New York University <i>New York, New York</i>	University of California–Los Angeles <i>Los Angeles, California</i>	University of Pennsylvania <i>Philadelphia, Pennsylvania</i>
Brown University <i>Providence, Rhode Island</i>	Northwestern University <i>Evanston, Illinois</i>	University of California–Riverside <i>Riverside, California</i>	University of Pittsburgh <i>Pittsburgh, Pennsylvania</i>
California Institute of Technology <i>Pasadena, California</i>	Ohio State University <i>Columbus, Ohio</i>	University of California–San Diego <i>La Jolla, California</i>	University of Puerto Rico–Rio Piedras <i>Rio Piedras, Puerto Rico</i>
Carnegie Mellon University <i>Pittsburgh, Pennsylvania</i>	Pennsylvania State University <i>University Park, Pennsylvania</i>	University of California–Santa Barbara <i>Santa Barbara, California</i>	University of Rochester <i>Rochester, New York</i>
Case Western Reserve University <i>Cleveland, Ohio</i>	Princeton University <i>Princeton, New Jersey</i>	University of California–Santa Cruz <i>Santa Cruz, California</i>	University of South Dakota <i>Vermillion, South Dakota</i>
College of William and Mary <i>Williamsburg, Virginia</i>	Purdue University <i>West Lafayette, Indiana</i>	University of Chicago <i>Chicago, Illinois</i>	University of Southern California <i>Los Angeles, California</i>
Columbia University <i>New York, New York</i>	Rensselaer Polytechnic Institute <i>Troy, New York</i>	University of Colorado at Boulder <i>Boulder, Colorado</i>	University of Tennessee <i>Knoxville, Tennessee</i>
Cornell University <i>Ithaca, New York</i>	Rice University <i>Houston, Texas</i>	University of Florida <i>Gainesville, Florida</i>	University of Texas at Austin <i>Austin, Texas</i>
Dartmouth College <i>Hanover, New Hampshire</i>	Rutgers University–New Brunswick <i>New Brunswick, New Jersey</i>	University of Georgia <i>Athens, Georgia</i>	University of Utah <i>Salt Lake City, Utah</i>
Duke University <i>Durham, North Carolina</i>	Saint Louis University <i>St. Louis, Missouri</i>	University of Illinois at Urbana-Champaign <i>Urbana, Illinois</i>	University of Vermont <i>Burlington, Vermont</i>
Emory University <i>Atlanta, Georgia</i>	Southern Methodist University <i>Dallas, Texas</i>	University of Iowa <i>Iowa City, Iowa</i>	University of Virginia <i>Charlottesville, Virginia</i>
George Washington University <i>Washington, D.C.</i>	Stanford University <i>Stanford, California</i>	University of Kansas <i>Lawrence, Kansas</i>	University of Washington <i>Seattle, Washington</i>
Georgetown University <i>Washington, D.C.</i>	Stevens Institute of Technology <i>Hoboken, New Jersey</i>	University of Kentucky <i>Lexington, Kentucky</i>	University of Wisconsin–Madison <i>Madison, Wisconsin</i>
Georgia Institute of Technology <i>Atlanta, Georgia</i>	SUNY at Binghamton <i>Binghamton, New York</i>	University of Maryland–Baltimore County <i>Baltimore, Maryland</i>	Vanderbilt University <i>Nashville, Tennessee</i>
Harvard University <i>Cambridge, Massachusetts</i>	SUNY at Buffalo <i>Buffalo, New York</i>	University of Maryland–College Park <i>College Park, Maryland</i>	Virginia Polytechnic Institute and State University <i>Blacksburg, Virginia</i>
Howard University <i>Washington, D.C.</i>	SUNY at Stony Brook <i>Stony Brook, New York</i>	University of Miami <i>Coral Gables, Florida</i>	Wake Forest University <i>Winston-Salem, North Carolina</i>
Indiana University at Bloomington <i>Bloomington, Indiana</i>	Texas A&M University <i>College Station, Texas</i>	University of Michigan–Ann Arbor <i>Ann Arbor, Michigan</i>	Washington University <i>St. Louis, Missouri</i>
Johns Hopkins University <i>Baltimore, Maryland</i>	Tufts University <i>Medford, Massachusetts</i>	University of Minnesota–Twin Cities <i>Minneapolis, Minnesota</i>	West Virginia University <i>Morgantown, West Virginia</i>
Lehigh University <i>Bethlehem, Pennsylvania</i>	Tulane University <i>New Orleans, Louisiana</i>	University of Mississippi <i>University, Mississippi</i>	Yale University <i>New Haven, Connecticut</i>
Louisiana State University & A&M College <i>Baton Rouge, Louisiana</i>	University of Alabama at Birmingham <i>Birmingham, Alabama</i>	University of Missouri–Columbia <i>Columbia, Missouri</i>	Yeshiva University <i>New York, New York</i>

APPENDIX B

ELECTRONIC PROPOSAL SUBMISSION

Proposals for the 2006 HHMI professors competition will be submitted and reviewed via the HHMI Competition System, a password-protected system on the Web. Each invited institution will be assigned a login ID and password for entering the Competition System to register and submit nominations. The invitation letter to the institution's president or chancellor includes the login ID and password.

After logging on to the Competition System at www.hhmi.org/grants/gcs, the registrant will be asked to provide contact information (name, title, e-mail address, and other information) and indicate whether the institution intends to nominate faculty members for the 2006 competition. The registrant, who is the individual to serve as the principal contact with HHMI before nominations, will use this login ID and password when preparing nominations to HHMI. **The deadline for registering your institution's intent to nominate faculty is March 15, 2005, and the nomination deadline is May 2, 2005.**

The steps for accessing the electronic proposal submission system follow:

1. Enter HHMI's Competition System at the following Web address: www.hhmi.org/grants/gcs. (For a list of compatible computer and browser configurations, go to http://hqnt15.hhmi.org/Easygrants_v4_HHMI_r1/Easygrants/Modules/Login/Controls/Page/pgBrowserCompatibility.aspx.)
2. On the login screen, enter the login ID and password provided in the invitation letter to your president or chancellor and click the login button.
3. The next page will contain a link titled "Step 1: Submit your Institution's Intent to Nominate for the 2006 HHMI Professors Competition." Click on the link.
4. You then go to a screen requesting information on the person at your institution designated as the principal contact with HHMI. Enter the information. *We ask you to complete this screen by the March 15, 2005, deadline even if your institution does not intend to submit nominations.*
5. On the same screen, you will see the following question: "Does your institution intend to submit nominations to HHMI?" Check "No" if your institution does not intend to submit nominations. *It is important to note that once your institution has indicated that it will not submit nominations, you will be unable to submit nominations through the Competition System.*
6. Check "Yes" if your institution intends to submit nominations. After entering the required information, click "Save" to store your information. The system will take you to the Competition System home page. Steps 4, 5, and 6 will not be required during future visits to the Competition System. However, you may review and change this information at any time before submitting nominations to HHMI.
7. If you selected the "Yes" (intend to submit) button, the system will display the following link: "Step 2: Submit Your Institution's Nominations for the 2006 HHMI Professors Competition." Click on this link to add nominations for your institution; you will be taken to the Nomination Screen.
8. On the Nomination Screen, click the "Add" button to add nominees. If you have already added nominees, this screen will also display information about the submitted nominees. You can submit up to two nominees for your institution. Once you have submitted both nominations for your institution, the "Add" button will not be visible.
9. On the Add Nomination Screen, enter the nominee's contact information in the appropriate fields. Click "Submit" to submit your nomination. Please note that after you submit your nominations, you will not be able to edit or delete them via the system. You will also receive an e-mail from HHMI confirming your submission, and each nominee will be sent a notification e-mail from HHMI. Contact HHMI if you need to make any revisions to a nominee's information.

For nominated faculty members, the Competition System will provide detailed instructions for completing the proposal, including important points for preparing proposals, technical instructions, programmatic guidelines, and an online version of the program announcement.

A toll-free telephone number (877-249-9932) and online help service (HHMISupport@arlgroupp.com) will allow the institutions and nominees to request technical assistance from the Arlington Group. Assistance will be available during normal business hours (Monday through Friday, 9:00 a.m. to 5:00 p.m. ET) throughout the nomination and proposal development period.

Each nominee must submit one hard copy of the entire proposal; all sections of the electronic proposal may be printed from the Competition System. **The deadline for submission of all required application materials (the online proposal, reference letters, and receipt of one hard copy of the proposal package) is 5:00 p.m. ET, September 7, 2005.**

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