



HOWARD HUGHES MEDICAL INSTITUTE

UNDERGRADUATE SCIENCE EDUCATION PROGRAM

Research and Doctoral Universities

Program Announcement
2006

Registration deadline: May 12, 2005
Proposal deadline: October 18, 2005
Awards notification: May 2006
Awards announcement: August 2006
Grant term begins: September 2006

HHMI
HOWARD HUGHES MEDICAL INSTITUTE
Undergraduate Science Education Program

2006 UNDERGRADUATE SCIENCE EDUCATION COMPETITION

The 2006 undergraduate grants competition is the 12th such competition and the 6th held for universities. It sustains and builds on previous competitions, which have provided \$371 million to strengthen education in biological sciences at 115 universities.

This program announcement provides general information about the competition's objectives, eligibility criteria, areas of fundable activities, electronic proposal submission process, deadlines, and criteria for proposal evaluation. *Applicants must refer to the HHMI competition system (www.hhmi.org/grants/gcs) to obtain detailed information on this competition, notify HHMI of their intent to participate, access the application forms, and submit their applications.*

PROGRAM OBJECTIVES

HHMI's 2006 Undergraduate Science Education Program will support initiatives that strengthen education in the biological sciences and other scientific disciplines as they relate to biology. Program objectives include the following:

- To integrate research and teaching in undergraduate education and to support student involvement in faculty research.
- To prepare undergraduates, including women and members of minority groups underrepresented in the sciences, for graduate studies and for careers in biomedical research, medicine, and science education, and to increase science literacy for all students, including nonscience majors.
- To bring fresh perspectives to established scientific disciplines and develop novel programs and courses in emerging areas, such as computational biology, genomics, and bioimaging, by supporting the development of teaching activities, the redesign of curricula, and the acquisition of laboratory and technological resources that effectively transmit new discoveries, ideas, and approaches in the biological sciences.
- To foster linkages between universities and elementary and secondary schools, community colleges, and other institutions in order to provide young students with early access to science, promote the development of precollege science teachers, and broaden access to science for students for whom such opportunities are limited.

- To develop, as appropriate, approaches that encourage teamwork among faculty, postdoctoral fellows, graduate students, and undergraduates and that reflect the nature of contemporary scientific research and education, such as enabling postdoctoral fellows and graduate students to complement their research training with substantive teaching and mentoring experiences that prepare them for future roles as educators.

In response to needs identified by HHMI through internal and external discussions, the 2006 competition is adding the following new objectives:

- To encourage collaborations among applicant institutions to expand opportunities and resources for all grant participants, including undergraduates, faculty, and precollege teachers and their students. Collaborations may be based on any element of commonality, including geographical region or complementary activities, and may encompass any of the program areas described below. Applicants should include plans for long-term support to maintain successful collaborations beyond the grant term.
- To provide opportunities and resources for faculty members to improve their teaching skills and course materials.
- To help various members of the academic community (faculty, postdoctorals, graduate and undergraduate students) focus on methods to mentor students effectively.

ELIGIBILITY CRITERIA

The 2006 competition is open by invitation to 203 institutions classified in 2000 by the Carnegie Foundation for the Advancement of Teaching as doctoral and research universities (extensive and intensive). The institutions invited to participate in the program have proven records in preparing students for graduate education and for careers in science research and medicine. (See list of invited institutions, page 6.)

PROGRAM AREAS

As in previous competitions, the undergraduate program provides funding in the following four principal areas:

- Student research and broadening access to science
- New, current, and future faculty development
- Curriculum, equipment, and laboratory development
- Precollege and other outreach

Institutions may request support for any or all of these areas. While each proposal will naturally reflect the unique mission, strengths, and needs of the applicant institution, proposals should be organized around these program areas. The activities noted below under each program area are provided as *examples only* and are in no way prescriptive. Applicants may find *Bio2010* (www.nap.edu) a useful resource for all areas of program development but are not restricted to using any particular resources or models. Applicants are encouraged to develop their own approaches to meeting the objectives of this competition.

STUDENT RESEARCH AND BROADENING ACCESS TO SCIENCE

Science education studies have shown that laboratory research, under the guidance of a scientist, can be an effective way to accelerate students' intellectual maturation and mastery of key concepts in modern biology. Moreover, the research experience can stimulate student interest in research or other science-related careers, such as teaching. For nonscience majors, participation in research introduces scientific concepts and brings an understanding of the scientific process.

Initiatives developed under this program component may include some of the following activities:

- Laboratory research opportunities either at the student's home institution or off campus at a research-intensive university, private corporation, government agency, or other setting as appropriate. Such opportunities may also involve students from other institutions. Research topics may vary from those in the traditional biological disciplines to those at the interface of biology and other disciplines (e.g., computational biology, bioengineering, and bioimaging). Plans to ensure effective mentoring of student researchers are often included and can enhance proposals.
- International research experiences, mentored by HHMI international scholars, with undergraduates supported by the undergraduate grant. (A list of international scholars can be found at www.hhmi.org/research/scholars.)
- Prefreshman laboratory research experiences that could start as early as the prefreshman summer and continue into the academic year.
- Activities to support retention in the sciences, such as fostering research communities of science-active undergraduates and providing cohorts of students, including disadvantaged students, with progressively sophisticated scientific experiences, research presentation opportunities, mentoring, academic support, and career advising over successive years of study.
- Activities to expand research and course opportunities for undergraduates through collaborations among applicant institutions.

Institutions requesting support for student research should describe the current research environment, including type of research projects open to students and current level of student and faculty mentor involvement. In requesting funds for activities to broaden access and opportunities, institutions should include current efforts to recruit and retain students and plans to strengthen these existing programs or develop new ones. Plans to leverage other sources of support to broaden these efforts may also be included and often enhance the competitiveness of the proposal.

Note: Review panels generally do not recommend direct salary support for faculty to supervise students in research projects. However, they will support incentives to encourage faculty to assume leadership roles in the program. Such requests may include support for the program director's summer salary or up to that amount for research or other educational activities associated with the program director's summer research.

NEW, CURRENT, AND FUTURE FACULTY DEVELOPMENT

An important avenue to improve the teaching of undergraduate science is through the professional development of new, current, and future faculty members. Since research universities are the principal source of the professoriate, encouraging existing faculty and faculty in training (postdoctoral fellows and graduate students) to be effective teachers as well as researchers will broadly enhance current and future activities in higher education. Proposed programs may include the following:

- Activities to prepare postdoctoral fellows (and graduate students) for future teaching roles, including opportunities to serve as instructors in research courses and mentors to undergraduates. Proposals that articulate organized plans designed to help and guide future faculty in teaching are welcome. (Postdoctoral fellows and graduate students may also be involved in activities under the other three program areas of this competition.) To assist applicants in designing programs to train postdoctoral fellows and graduate students as mentors for undergraduates, HHMI will provide a copy of *Entering Mentoring: A Seminar to Train a New Generation of Scientists*, a guide developed by the New Generation Program at the University of Wisconsin–Madison. It will be available as a PDF on the HHMI competition system.
- Opportunities for junior, mid-level, and senior faculty to explore new scientific areas, information-based technologies, and approaches to teaching and to integrate these into their science curricula.
- Start-up support for new faculty to broaden research and curricular development activities for undergraduates and for the institution as a whole. Applicants should take care to consider a feasible workload for new faculty

members, who will need time to set up laboratories as well as teach and mentor students. (Requests for faculty start-up must be well justified and include a discussion of the expected impact of the appointments on undergraduate education, as well as specific plans for continuing the position beyond the grant period.)

- Resources and collaborative opportunities for faculty members to enrich undergraduate science education, create effective materials and methods for teaching, and further develop their teaching skills.

In 2003 HHMI, the National Academies, and the University of Wisconsin–Madison launched the Summer Institute on Undergraduate Education in Biology. It places teams of faculty members from research universities in intensive workshops with the goal of integrating current scientific research and appropriate teaching techniques into the creation and delivery of new curricula that actively engage students in learning science. The summer institute, presently offered at the University of Wisconsin–Madison, provides opportunities for faculty from universities throughout the country to develop biology courses and teaching materials they can implement with colleagues at their home institutions. Although the current focus of the summer institute is on introductory biology courses, there are plans to expand the workshop topics into other areas of the undergraduate biology curriculum. Further information about the summer institute may be found at www.academiessummerinstitute.org.

To take advantage of the faculty development opportunities at the summer institute, applicants to the 2006 HHMI undergraduate grants competition may include in their proposal budgets funding for teams of two to three faculty members (particularly junior faculty members) to participate in a summer institute during at least one of the four years of the grant term, beginning in summer 2007. Applicants should budget HHMI funds for faculty to travel to the summer institute, implement new curricula developed at the summer institute (including released time, outside speakers or consultants, and supplies), and assess the results and disseminate findings. Proposals should include areas of the undergraduate biology curriculum applicants would like to address at a summer institute and plans for institutional

implementation of the curricula. Additional information about the summer institute and developing plans and budgets for curricular implementation will be available to applicants in the HHMI competition system.

CURRICULUM, EQUIPMENT, AND LABORATORY DEVELOPMENT

Curricula and equipment that reflect new scientific discoveries and teaching approaches are essential for creating a rich learning environment for students. Proposed programs may include the following:

- The enrichment of existing—or the development of new—science courses and programs, such as those that bridge scientific disciplines (e.g., computational biology, bioengineering, and bioimaging) and integrate biology instruction with the teaching of chemistry, physics, mathematics, and computer science.
- The expansion and updating of laboratories and the acquisition of instruments, computers, and other equipment. The development of modules or entire formal research-based courses and laboratories that involve a large number of students, including nonscience majors, in authentic research in a team setting. (The program does not support the acquisition of major equipment for research purposes, requests for endowment support, or the construction of new buildings. The awards are not intended to provide incremental support for other large-scale construction projects or major reconstruction of facilities. Only equipment that is to be used for instructional purposes will be considered. Funds requested for laboratory renovations and equipment must not exceed 50 percent of the total grant request.)
- The development of new types of basic or applied science courses for science and nonscience majors who plan on pursuing nonscience careers. Similarly, the development of courses for preservice science teachers that prepare them to provide meaningful science experiences for their future students. (Partnerships, where appropriate, between the institution's science and education departments may strengthen the science preparation of education majors.)

- The development of educational resources to be made available to the broader science community. For example, an undergraduate research facility or multimedia and course development center could be housed and maintained at one applicant institution, with cost and use shared with other applicants.

Note: Requests for funds to renovate facilities or purchase equipment should indicate how the expenditure will enhance the teaching of science or promote undergraduate research. Requests for funds to develop communication and information resources should include a discussion of how the technologies would supplement laboratory instruction.

PRECOLLEGE AND OTHER OUTREACH

University science departments can provide a critical bridge in science education and training for students and teachers at elementary and secondary schools, community colleges, or other four-year institutions. Proposed programs by individual or collaborating applicants may include:

- Age-appropriate activities such as summer science camps or summer research for precollege students that engage the interest of younger students and help older students explore the possibility of a science major and career. Activities may also include those that broaden opportunities for students at two- or four-year institutions.
- Opportunities to encourage science majors to pursue teaching careers and provide them with preservice classroom and laboratory teaching experience.
- Teacher enhancement programs to update teachers on contemporary science in summer institutes or academic-year encounters. Programs that deliver new standards-based exercises, activities, and materials to classrooms to promote active learning of contemporary science are welcome. Partnerships with teachers for both development and delivery of institutes and workshops often help faculty in research universities match the scale and needs of K–12 teaching.

- Experiences to enhance the professional development of in-service science teachers, such as faculty-mentored summer research, joint faculty-teacher development of teaching materials, and participation in upper-level science courses. Proposed programs may also include activities that help teachers transfer their newly gained knowledge to their students, such as involvement of undergraduates or graduate students during the academic year and provision of equipment footlockers.
- Development of shared educational and information technology and the use of communication technology to strengthen interactions among teachers and between teachers and scientists, such as a technology resource center to be shared among teachers participating within a consortium of applicants.
- Activities that build on existing institutional collaborations by supporting research opportunities for undergraduates from other institutions, joint science faculty appointments, development of shared laboratory facilities and science programs, and outreach programs involving faculty and other resources from two or more applicant institutions.

Note: If the applicant proposes precollege or outreach programs involving collaboration with other institutions, the proposal must include letters from these institutions specifying the extent to which the collaborating institutions are willing and able to participate.

PROGRAM ASSESSMENT AND DISSEMINATION

Assessment

An important part of education in general and science education in particular, assessment can provide valuable information on how grant program activities are meeting their objectives. *The applicant institution should include an assessment plan specifying the evaluation methods to be used.* Objectives whose outcomes can be measured should be included.

In addition, institutions receiving HHMI undergraduate awards are required to track faculty, students, and others participating in their HHMI-supported programs. Grantees will be expected to provide this

information in their annual program reports to HHMI and through HHMI's online faculty tracking system. Grantees will also be expected to conduct long-term tracking of HHMI-supported undergraduate researchers, such as entrance into graduate or medical school and career outcomes. Information will be provided to grantees following notification of their awards on specific tracking data they will be expected to submit to HHMI.

Dissemination

Another important outcome-related grant activity is dissemination. Where appropriate, applicants should provide a national dissemination strategy to extend successes achieved locally to the larger science education community. Publication in science education journals such as the American Society for Cell Biology's *Cell Biology Education* (www.cellbioed.org) or through other professional societies can be an effective tool for dissemination of successful models or science education research from the grant. Digital libraries that may be appropriate for dissemination of grant products may include BEN (BiosciEdNet), a collaborative effort among professional societies (www.bioscienet.org), and the National Science Foundation's national science, technology, engineering, and mathematics education digital library (<http://nsdl.org>). Applicants are encouraged to use dissemination vehicles that they judge to be the most appropriate for delivery of their materials and findings.

PROGRAM ADMINISTRATION

HHMI undergraduate grants do not allow for indirect costs; however, up to 10 percent of the award may be budgeted for direct program administration, which typically includes clerical support, preparation and dissemination of participant recruiting materials, Internet access charges, and the like.

Note: Costs for faculty involvement should be delineated as faculty salaries under each relevant program area instead of being included in the program administration category.

PREVIOUS PROGRAM ACCOMPLISHMENTS

In their proposals, applicants are required to submit information (narrative along with supporting data) about accomplishments of previous programs supported by HHMI or, for applicants who have not received HHMI support, accomplishments relevant to the proposed activities. HHMI acknowledges that previous grantees will have had outcomes specific to their grants. Therefore, each grantee's outcomes will reflect the unique goals of each of its programs. For example, some grantees may have sought to retain undergraduates in a science major, while others may have sought to encourage undergraduates to go on to Ph.D. programs and research careers.

No matter what the expected outcomes, applicants should provide quantitative as well as qualitative evidence of the success of their programs for as long a period as possible and for all program areas.

Note: The review panel pays particular attention to the "Previous Accomplishments" section of the proposal, and it is weighed heavily in the panel's evaluation of a proposal submitted by a previous HHMI grantee. Where appropriate, continuation of previous successful activities is acceptable, although it is of benefit to the panel that applicants distinguish between previous and new activities.

GRANTEE INSTITUTION PROCESS FOR DISTRIBUTION OF FUNDS

Applicant institutions must name a program director who will be responsible for the administration of funds and the establishment of necessary review and evaluation processes for program activities. The program director should have proven leadership in science research and education. Where appropriate, the grantee institution should establish an advisory committee to assist the program director in administration of the program and in the allocation of funds—for example, in selecting students for research opportunities or in determining which faculty should receive professional development support.

ELECTRONIC PROPOSAL SUBMISSION AND DEADLINES

Applicants must register and submit proposals using the online HHMI competition system (see page 8). Proposal materials, registration forms, instructions, and this program announcement can be found at www.hhmi.org/grants/gcs. The invitation letter provides each institution with a temporary login ID, password, and unique identifier. *We strongly recommend that institutions intending to submit a proposal refer to the material in the HHMI competition system early in the proposal planning process.*

Institutions must register their intent to submit proposals via the competition system by May 12, 2005. The deadline for submitting proposals is 5:00 p.m. ET, October 18, 2005.

In developing their proposals, applicant institutions are encouraged to take advantage of the information on the HHMI website, including summaries of the activities of undergraduate program grantees, proceedings of the meetings of undergraduate program directors, and other resources in science education. Go to www.hhmi.org/grants/office/undergrad.

CRITERIA AND PROCESS FOR PROPOSAL EVALUATION

A panel of distinguished scientists and educators will review the proposals. On the basis of this review, HHMI will make the final selection and authorize funding. The principal evaluation criteria are as follows:

Proposed Activities

- The degree to which the proposal addresses one or more of the objectives of this initiative (see page 1).
- The likelihood that the proposed activities will meet the applicant's stated objectives.
- The correlation between the proposed goals and activities and the applicant's overall scientific or educational mission and its capacity to achieve them.
- The degree to which the proposed program will enable the applicant to enhance or expand its ongoing activities or to undertake new initiatives.

- The relationship, if any, of the proposed activities to initiatives already under way at the applicant institution supported either by a previous HHMI award or other external funding. (Applicants should note the importance of completing the section in the application form that pertains to previous grant activities and accomplishments.)

Budget and Administration

- The effectiveness of the plan for management and administration of the program, including distribution of grant funds.
- The appropriateness of the budget to activities specified in the proposal.

Long-Term Impact

- Evidence of noteworthy innovations or particularly compelling approaches for effecting long-term institutional or departmental change in undergraduate science education.
- Evidence that the program is likely to have a significant impact on the long-term development of relevant science departments.
- Evidence that the applicant has made plans for broad dissemination of any knowledge or product resulting from the grant.
- Evidence of support by the applicant's administration and of substantial involvement of the relevant science faculty, particularly senior research faculty, in proposed program activities.
- Evidence that responsibilities for program development and administration are distributed among appropriate members of the faculty, administration, and staff.

Applicants should also consult the factors cited in the "Important Points for Applicants" section of the online application form.

While there is no requirement that the proposed activities be continued beyond the term of the grant award, it is expected that the applicant institution will make every effort to sustain the successful elements of the proposed program. Plans to sustain effective collaborations are also important.

Please note that some programs whose objectives are to achieve educational diversity and provide opportunities for

women and underrepresented minorities have been subject to legal challenges. HHMI is firmly committed to these objectives and believes that such programs can be designed and conducted so as to comply with applicable law. HHMI relies, however, on applicant institutions to design and conduct their programs in compliance with applicable law.

THE AWARDS

Applicants will be notified of their award status in May 2006; awards will be officially announced in August 2006. The awards are expected to range from \$1.2 to \$2.2 million. Grants will be made in four equal annual payments starting in September 2006. Grantee institutions will be required to submit annual progress reports of their program activities and annual financial reports, as well as results of long-term assessment of their programs. *(Unresolved issues of report compliance may determine participation in future competitions and distribution of future grant payments.)*

Each grantee institution's program director or alternate (as designated by the program director) is expected to attend a meeting once every two years at HHMI headquarters in Chevy Chase, Maryland.

The program is expected to be highly competitive, and only a limited number of requests can be funded. Awards will be based on the quality of proposals received and the availability of funds. Applicants will not be informed of the progress of their proposals until the official award notification.

INFORMATION

Call Andrew Quon, program officer, or Mary Bonds, program assistant, at 301-215-8872 with any inquiries regarding this program, or send an e-mail message to 2006ugcomp@hhmi.org.

A toll-free number and online help service allow applicant institutions to request technical assistance for the HHMI competition system from the Arlington Group, the company providing technical support (see page 8). Assistance is available during regular business hours (9:00 a.m. to 5:00 p.m. ET) throughout the proposal development period.

2006 UNDERGRADUATE SCIENCE EDUCATION COMPETITION: 203 INVITED INSTITUTIONS

American University <i>Washington, D.C.</i>	Drexel University <i>Philadelphia, Pennsylvania</i>	Louisiana State University and A&M College <i>Baton Rouge, Louisiana</i>	Princeton University <i>Princeton, New Jersey</i>
Andrews University <i>Berrien Springs, Michigan</i>	Duke University <i>Durham, North Carolina</i>	Louisiana Tech University <i>Ruston, Louisiana</i>	Purdue University <i>West Lafayette, Indiana</i>
Arizona State University <i>Tempe, Arizona</i>	Duquesne University <i>Pittsburgh, Pennsylvania</i>	Loyola University of Chicago <i>Chicago, Illinois</i>	Rensselaer Polytechnic Institute <i>Troy, New York</i>
Auburn University <i>Auburn University, Alabama</i>	Emory University <i>Atlanta, Georgia</i>	Marquette University <i>Milwaukee, Wisconsin</i>	Rice University <i>Houston, Texas</i>
Baylor University <i>Waco, Texas</i>	Florida Atlantic University <i>Boca Raton, Florida</i>	Massachusetts Institute of Technology <i>Cambridge, Massachusetts</i>	Rutgers University—New Brunswick <i>New Brunswick, New Jersey</i>
Boston College <i>Chestnut Hill, Massachusetts</i>	Florida Institute of Technology <i>Melbourne, Florida</i>	Miami University <i>Oxford, Ohio</i>	Rutgers University—Newark <i>Newark, New Jersey</i>
Boston University <i>Boston, Massachusetts</i>	Florida International University <i>Miami, Florida</i>	Michigan State University <i>East Lansing, Michigan</i>	Saint Louis University <i>St. Louis, Missouri</i>
Bowling Green State University <i>Bowling Green, Ohio</i>	Florida State University <i>Tallahassee, Florida</i>	Michigan Technological University <i>Houghton, Michigan</i>	San Diego State University <i>San Diego, California</i>
Brandeis University <i>Waltham, Massachusetts</i>	Fordham University <i>Bronx, New York</i>	Mississippi State University <i>Mississippi State, Mississippi</i>	Seton Hall University <i>South Orange, New Jersey</i>
Brigham Young University <i>Provo, Utah</i>	George Mason University <i>Fairfax, Virginia</i>	Montana State University—Bozeman <i>Bozeman, Montana</i>	Southern Illinois University— Carbondale <i>Carbondale, Illinois</i>
Brown University <i>Providence, Rhode Island</i>	George Washington University <i>Washington, D.C.</i>	New Jersey Institute of Technology <i>Newark, New Jersey</i>	Southern Methodist University <i>Dallas, Texas</i>
California Institute of Technology <i>Pasadena, California</i>	Georgetown University <i>Washington, D.C.</i>	New Mexico State University <i>Las Cruces, New Mexico</i>	Stanford University <i>Stanford, California</i>
Carnegie Mellon University <i>Pittsburgh, Pennsylvania</i>	Georgia Institute of Technology <i>Atlanta, Georgia</i>	New York University <i>New York, New York</i>	Stevens Institute of Technology <i>Hoboken, New Jersey</i>
Case Western Reserve University <i>Cleveland, Ohio</i>	Georgia State University <i>Atlanta, Georgia</i>	North Carolina State University at Raleigh <i>Raleigh, North Carolina</i>	SUNY at Albany <i>Albany, New York</i>
Catholic University of America <i>Washington, D.C.</i>	Harvard University <i>Cambridge, Massachusetts</i>	North Dakota State University <i>Fargo, North Dakota</i>	SUNY at Binghamton <i>Binghamton, New York</i>
Clark Atlanta University <i>Atlanta, Georgia</i>	Howard University <i>Washington, D.C.</i>	Northern Arizona University <i>Flagstaff, Arizona</i>	SUNY at Buffalo <i>Buffalo, New York</i>
Clark University <i>Worcester, Massachusetts</i>	Idaho State University <i>Pocatello, Idaho</i>	Northwestern University <i>Evanston, Illinois</i>	SUNY at Stony Brook <i>Stony Brook, New York</i>
Clarkson University <i>Potsdam, New York</i>	Illinois Institute of Technology <i>Chicago, Illinois</i>	Ohio State University <i>Columbus, Ohio</i>	SUNY College of Environmental Science and Forestry <i>Syracuse, New York</i>
Clemson University <i>Clemson, South Carolina</i>	Illinois State University <i>Normal, Illinois</i>	Ohio University <i>Athens, Ohio</i>	Syracuse University <i>Syracuse, New York</i>
College of William and Mary <i>Williamsburg, Virginia</i>	Indiana University at Bloomington <i>Bloomington, Indiana</i>	Oklahoma State University <i>Stillwater, Oklahoma</i>	Temple University <i>Philadelphia, Pennsylvania</i>
Colorado School of Mines <i>Golden, Colorado</i>	Iowa State University <i>Ames, Iowa</i>	Old Dominion University <i>Norfolk, Virginia</i>	Tennessee State University <i>Nashville, Tennessee</i>
Colorado State University <i>Fort Collins, Colorado</i>	Johns Hopkins University <i>Baltimore, Maryland</i>	Oregon State University <i>Corvallis, Oregon</i>	Texas A&M University <i>College Station, Texas</i>
Columbia University <i>New York, New York</i>	Kansas State University <i>Manhattan, Kansas</i>	Pennsylvania State University <i>University Park, Pennsylvania</i>	Texas Christian University <i>Fort Worth, Texas</i>
Cornell University <i>Ithaca, New York</i>	Kent State University <i>Kent, Ohio</i>	Pepperdine University <i>Malibu, California</i>	Texas Tech University <i>Lubbock, Texas</i>
Dartmouth College <i>Hanover, New Hampshire</i>	Lehigh University <i>Bethlehem, Pennsylvania</i>	Polytechnic University <i>Brooklyn, New York</i>	Tufts University <i>Medford, Massachusetts</i>
DePaul University <i>Chicago, Illinois</i>	Loma Linda University <i>Loma Linda, California</i>	Portland State University <i>Portland, Oregon</i>	Tulane University <i>New Orleans, Louisiana</i>

University of Akron <i>Akron, Ohio</i>	University of Houston <i>Houston, Texas</i>	University of New Orleans <i>New Orleans, Louisiana</i>	University of Vermont <i>Burlington, Vermont</i>
University of Alabama <i>Tuscaloosa, Alabama</i>	University of Idaho <i>Moscow, Idaho</i>	University of North Carolina at Chapel Hill <i>Chapel Hill, North Carolina</i>	University of Virginia <i>Charlottesville, Virginia</i>
University of Alabama at Birmingham <i>Birmingham, Alabama</i>	University of Illinois at Chicago <i>Chicago, Illinois</i>	University of North Dakota <i>Grand Forks, North Dakota</i>	University of Washington <i>Seattle, Washington</i>
University of Alabama in Huntsville <i>Huntsville, Alabama</i>	University of Illinois at Urbana-Champaign <i>Urbana, Illinois</i>	University of North Texas <i>Denton, Texas</i>	University of Wisconsin–Madison <i>Madison, Wisconsin</i>
University of Alaska, Fairbanks <i>Fairbanks, Alaska</i>	University of Iowa <i>Iowa City, Iowa</i>	University of Notre Dame <i>Notre Dame, Indiana</i>	University of Wisconsin–Milwaukee <i>Milwaukee, Wisconsin</i>
University of Arizona <i>Tucson, Arizona</i>	University of Kansas <i>Lawrence, Kansas</i>	University of Oklahoma <i>Norman, Oklahoma</i>	University of Wyoming <i>Laramie, Wyoming</i>
University of Arkansas <i>Fayetteville, Arkansas</i>	University of Kentucky <i>Lexington, Kentucky</i>	University of Oregon <i>Eugene, Oregon</i>	Utah State University <i>Logan, Utah</i>
University of California–Berkeley <i>Berkeley, California</i>	University of Louisiana at Lafayette <i>Lafayette, Louisiana</i>	University of Pennsylvania <i>Philadelphia, Pennsylvania</i>	Vanderbilt University <i>Nashville, Tennessee</i>
University of California–Davis <i>Davis, California</i>	University of Louisville <i>Louisville, Kentucky</i>	University of Pittsburgh <i>Pittsburgh, Pennsylvania</i>	Virginia Commonwealth University <i>Richmond, Virginia</i>
University of California–Irvine <i>Irvine, California</i>	University of Maine <i>Orono, Maine</i>	University of Puerto Rico–Rio Piedras <i>Rio Piedras, Puerto Rico</i>	Virginia Polytechnic Institute and State University <i>Blacksburg, Virginia</i>
University of California–Los Angeles <i>Los Angeles, California</i>	University of Maryland, Baltimore County <i>Baltimore, Maryland</i>	University of Rhode Island <i>Kingston, Rhode Island</i>	Wake Forest University <i>Winston-Salem, North Carolina</i>
University of California–Riverside <i>Riverside, California</i>	University of Maryland, College Park <i>College Park, Maryland</i>	University of Rochester <i>Rochester, New York</i>	Washington State University <i>Pullman, Washington</i>
University of California–San Diego <i>La Jolla, California</i>	University of Massachusetts at Amherst <i>Amherst, Massachusetts</i>	University of San Diego <i>San Diego, California</i>	Washington University <i>St. Louis, Missouri</i>
University of California–San Francisco <i>San Francisco, California</i>	University of Memphis <i>Memphis, Tennessee</i>	University of South Carolina at Columbia <i>Columbia, South Carolina</i>	Wayne State University <i>Detroit, Michigan</i>
University of California–Santa Barbara <i>Santa Barbara, California</i>	University of Miami <i>Coral Gables, Florida</i>	University of South Dakota <i>Vermillion, South Dakota</i>	West Virginia University <i>Morgantown, West Virginia</i>
University of California–Santa Cruz <i>Santa Cruz, California</i>	University of Michigan–Ann Arbor <i>Ann Arbor, Michigan</i>	University of South Florida <i>Tampa, Florida</i>	Wichita State University <i>Wichita, Kansas</i>
University of Central Florida <i>Orlando, Florida</i>	University of Minnesota–Twin Cities <i>Minneapolis, Minnesota</i>	University of Southern California <i>Los Angeles, California</i>	Worcester Polytechnic Institute <i>Worcester, Massachusetts</i>
University of Chicago <i>Chicago, Illinois</i>	University of Mississippi <i>University, Mississippi</i>	University of Southern Mississippi <i>Hattiesburg, Mississippi</i>	Wright State University <i>Dayton, Ohio</i>
University of Cincinnati <i>Cincinnati, Ohio</i>	University of Missouri, Columbia <i>Columbia, Missouri</i>	University of Tennessee at Knoxville <i>Knoxville, Tennessee</i>	Yale University <i>New Haven, Connecticut</i>
University of Colorado at Boulder <i>Boulder, Colorado</i>	University of Missouri–Kansas City <i>Kansas City, Missouri</i>	University of Texas at Arlington <i>Arlington, Texas</i>	Yeshiva University <i>New York, New York</i>
University of Colorado at Denver <i>Denver, Colorado</i>	University of Missouri–Rolla <i>Rolla, Missouri</i>	University of Texas at Austin <i>Austin, Texas</i>	
University of Connecticut <i>Storrs, Connecticut</i>	University of Montana <i>Missoula, Montana</i>	University of Texas at Dallas <i>Richardson, Texas</i>	
University of Delaware <i>Newark, Delaware</i>	University of Nebraska at Lincoln <i>Lincoln, Nebraska</i>	University of the Pacific <i>Stockton, California</i>	
University of Denver <i>Denver, Colorado</i>	University of Nevada–Reno <i>Reno, Nevada</i>	University of Toledo <i>Toledo, Ohio</i>	
University of Florida <i>Gainesville, Florida</i>	University of New Hampshire <i>Durham, New Hampshire</i>	University of Tulsa <i>Tulsa, Oklahoma</i>	
University of Georgia <i>Athens, Georgia</i>	University of New Mexico <i>Albuquerque, New Mexico</i>	University of Utah <i>Salt Lake City, Utah</i>	

ELECTRONIC PROPOSAL SUBMISSION

Proposals for the 2006 Undergraduate Science Education Program competition will be submitted and reviewed via the HHMI competition system, a password-protected system on the Web. The invitation letter to each institution's president or chancellor includes registration instructions and a unique identifier for the competition system. 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). Each registrant will then be asked to provide the institution's unique identifier before indicating whether the institution intends to submit a proposal for the 2006 competition. *The deadline for registering and providing contact information is May 12, 2005.*

Follow these steps to access the electronic proposal submission system:

1. Enter the HHMI 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 *guest* and the password *register* and click the "Log In" button.
 3. The next page will contain a link titled "2006 HHMI Undergraduate Science Education—Registration." 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 contact information, choose a password, and click the "Submit" button. *We ask you to complete this screen by the May 12, 2005, deadline even if your institution does not intend to submit a proposal.*
 5. The next page is your home page. This page will contain a link titled "2006 HHMI Undergraduate Science Education—Intent to Apply." Click on the link.
 6. Enter your institution's unique identifier (included in your institution's invitation letter) and indicate whether you plan to submit a proposal. If you indicate "No" and click the "Submit" button, you will be returned to your home page. At this point, you may exit the competition system by clicking "Logout" on the left panel or by closing your browser. *It is important to note that once your institution*
- has indicated that it will not submit a proposal, it will be unable to submit a proposal through the competition system.*
7. If you select "Yes" and click the "Submit" button, the system will display a confirmation screen. To continue the application process, click on the "Home" link on the left navigation bar. This will return you to the home page. During future visits to the competition system, you will use your e-mail address as your login ID and the password you provided in step 4. Steps 3, 4, 5, 6, and 7 will no longer be required.
 8. On the home page, click on the "2006 Undergraduate Science Education—Application" link to start your application. The competition system will provide detailed instructions for completing the proposal, including important points for preparing proposals, technical instructions, programmatic and budgetary guidelines, and an online version of the program announcement, along with electronic forms requesting budget and other data. The forms must be completed in the format provided.

A toll free telephone number (1-877-249-9932) and online help service (HHMISupport@arlgroupp.com) allow institutions to request technical assistance from the Arlington Group. Assistance is available during regular business hours (9:00 a.m. to 5:00 p.m. ET) throughout the proposal development period.

Each institution must submit one hard copy of the entire proposal; all sections of the electronic proposal must be printed from the competition system. **The deadline for submission of the online proposal and receipt of the hard copy is 5:00 p.m. ET, October 18, 2005.**

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.

UNDERGRADUATE SCIENCE EDUCATION PROGRAM

Since 1988, through its undergraduate science education program, HHMI has awarded more than \$606 million to 241 public and private colleges and universities in 47 states, the District of Columbia, and Puerto Rico. Competitions alternate between institutions classified as baccalaureate and master's ("colleges"; last competition in 2004) and research and doctoral ("universities"; last competition in 2002). In 2002, HHMI launched the HHMI professors program, awarding four-year grants of \$1 million each to 20 HHMI professors at research universities across the country. The HHMI professors program supports and empowers accomplished research scientists to transmit the excitement and values of scientific research to undergraduate education. HHMI initiated the Exceptional Research Opportunities Program (EXROP) in 2003. This program pairs disadvantaged students with HHMI scientists for mentored summer research experiences and encourages those students to pursue careers in academic science.

The undergraduate program also provided support for the 2003 National Academy of Sciences report *Bio2010: Transforming Undergraduate Education for Future Research Biologists*, which recommended a comprehensive review of undergraduate science education, and it has awarded grants to the American Society for Cell Biology for *Cell Biology Education*, the first peer-reviewed electronic journal on education in the biological sciences (www.cellbioed.org). For more information on the undergraduate program and other HHMI grant initiatives, go to www.hhmi.org/grants.

HHMI

HOWARD HUGHES MEDICAL INSTITUTE

Office of Grants and Special Programs

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