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HHMI Invites Colleges to Compete for Grants to Strengthen Undergraduate Research, Mentoring, Computational Skills

More than 200 colleges and master's-level universities have been invited to compete for \$60 million in science education grant funding from the Howard Hughes Medical Institute. The 226 institutions are the most ever invited to participate in an undergraduate competition in the Institute's history.

HHMI expects to award approximately 50 grants ranging from \$800,000 to \$1.6 million to support innovative programs that strengthen undergraduate research, mentoring, interdisciplinary research, and the computational skills of students and faculty.

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— Peter J. Bruns

Colleges and master's-level universities face an enormous challenge: finding the funds to support undergraduate and faculty research in the sciences. Although a 2006 National Science Board report on science and engineering indicators showed that colleges produce almost half of the bachelor's degrees in the physical, biological, and agricultural sciences, and educate substantial numbers of minorities underrepresented in the sciences, they receive less than 5 percent of all federal research dollars. As a result, colleges often lack the resources to stay current in the sciences and to provide their students with state-of-the-art research experiences.

Through this competition, HHMI seeks to buttress the research capacity of college science departments in the context of teaching, and to integrate the life sciences with other disciplines, including mathematics and computer science, in ways that reflect the increasingly quantitative nature of modern biological research.

"Colleges are equipped to do certain things extremely well," said Thomas R. Cech, president of HHMI. "For example, with a low student-faculty ratio, they can offer intensive mentoring and provide many opportunities for

undergraduates to conduct research. They also tend to teach science across disciplinary lines. We hope that these grants will enable the colleges to engage more students in inquiry-based science earlier in their undergraduate years. We also hope to help science departments broaden their expertise in emerging disciplines and to support and disseminate innovative approaches to science teaching." Cech, who won the 1989 Nobel Prize in Chemistry, is himself a graduate of a liberal arts college.

The grants are designed to build on the special strengths of baccalaureate and master's degree-granting institutions and to provide the tools to address their particular needs, such as technical support personnel, honoraria for faculty who mentor student research during the summer, and programs to strengthen the quantitative and computational skills of life sciences faculty and those in related fields.

"Because they get very little federal research support, the colleges struggle to create the research infrastructure to conduct cutting-edge research," said Peter J. Bruns, HHMI vice president for grants and special programs. "And to do good teaching, you need to be doing good research."

HHMI science education grants can have a particularly powerful impact because they enable colleges to diversify their curricula by hiring faculty in emerging disciplines and by providing technical personnel and laboratory resources that support the integration of research and teaching. Colleges can also use the grants to recruit and mentor students from minority groups underrepresented in the sciences and to improve precollege science teaching by building ties between college science departments and the K-12 students and teachers in their communities.

"We're particularly concerned with the long-term impact of these grants," Bruns said. "We will be looking for proposals that include plans to assess the impact of programs using measurable outcomes, as well as evidence of noteworthy innovations or compelling new approaches for bringing about long-term institutional or departmental changes in undergraduate science education."

Institutions are invited to compete based on their proven records in preparing undergraduates for graduate education in science and for careers in scientific research and medicine. In the past, the top 200 colleges were invited to apply. This year, to increase the pool of applicants, the Institute invited the 226 colleges with the highest percentage of graduates, including underrepresented minorities, who go on to graduate or medical school. For the first time, invited institutions include a Native American tribal college.

A panel of leading scientists and educators will review the applications and make recommendations to the HHMI undergraduate science education grants staff. Awards will be announced in May 2008.

Through its Undergraduate Science Education Program, HHMI has awarded \$235.8 million in grants to 126 colleges throughout the United States and

Puerto Rico since 1988, part of \$693 million in grants for undergraduate science education that the Institute has awarded to institutions of higher education, including research and doctoral universities. HHMI is the largest private supporter of science education in the United States.