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Howard Hughes Medical Institute's Million-Dollar Professors

What would you do with a million dollars? Twenty scientists at research universities across the nation have 20 different answers. They all share a goal, however: to make science more engaging for undergraduates. The Howard Hughes Medical Institute (HHMI) today announced their appointment as its first HHMI Professors. Each is a leading researcher who will receive \$1 million over the next four years to bring the creativity they have shown in the lab to the undergraduate classroom.

Research is advancing at a breathtaking pace, but many university students are still learning science the same old way, by listening to lectures, memorizing facts and doing cookbook lab experiments that thousands have done before, says HHMI President Thomas R. Cech. We want to empower scientists at research universities to become more involved in breaking the mold and bringing the excitement of research to science education. Cech is a biochemist who continued teaching undergraduates at the University of Colorado at Boulder even after he won a Nobel Prize.

"Isiah Warner, Louisiana State University,
mentors a student."

HHMI isn't the only one to see opportunities for improving the way undergraduates are taught science. The National Academy of Sciences, the Boyer Commission on Educating Undergraduates in the Research University and the National Science Foundation all have studied the matter and made recommendations for more engaging and effective approaches to undergraduate science education.

Teaching of undergraduates tends to be undervalued at research universities, notes Peter J. Bruns, vice president for grants and special programs at HHMI. By rewarding great teaching and supporting a synergistic interaction between research and undergraduate education, we hope to sow seeds of a fundamental change in the culture of research universities. We want the HHMI Professors to demonstrate that active, productive scientists can be effective teachers too. Bruns, a leading geneticist from Cornell University, also taught undergraduates throughout his research career.

HHMI invited 84 research universities to nominate faculty members. A panel of scientists and educators reviewed 150 nominees proposals and eventually selected 20 HHMI Professors at 19 universities in 13 states (See list of Professors and their institutions below.) All are tenured faculty members. They include nine women and three members of minority groups.

Some will focus on attracting more women and minorities into science; others want undergraduates to understand the increasingly interdisciplinary nature of science and its rapidly emerging new fields. Some will focus on providing early research experiences, and others will develop new high-tech teaching tools. For example:

Darcy Kelley, a biologist at Columbia University in New York, thinks every college freshman should be exposed to the great ideas of science and the way that scientists think. Shes creating a course called Frontiers in Science, with lectures and discussion sections led by graduate students, on topics such as the origins of life and how the brain works. Hilary Godwin, a chemistry professor at Northwestern University near Chicago, wants to see more minorities in science, where only 1 percent of the faculty in the top 50 chemistry departments is African American or Hispanic. She will establish a Minority Success in Science program that includes a research project assessing lead levels in soil in the Chicago area, a focus of Godwins own research. Isiah Warner, an analytical chemist at Louisiana State University, also will focus on mentoring minorities. An African American, Warner is developing a mentoring ladder reaching back into the secondary schools, where he says minorities often dont get the preparation they need for college science. Rebecca Richards-Kortum, a biomedical engineering professor at the University of Texas at Austin, will introduce undergraduates to the interdisciplinary nature of 21st century engineering. Physiologists, biomedical engineers, biomathematicians and physician-scientists will collaborate on new courses for engineering majors and non-majors, exploring experimental medicine, human research and imaging technologies. Tim Stearns, a Stanford cell biologist and geneticist, is creating a pre-grad program similar to pre-med programs, to recruit and train undergraduates to become practicing scientists. It will provide research opportunities and lab rotations with research faculty members, courses based on primary literature, attendance at a national research meeting, an honors thesis, a career-oriented seminar and career advising.

As researchers recognized in their fields, the HHMI Professors will participate in HHMI investigators scientific meetings at Institute headquarters in Chevy Chase, Maryland. They will serve as a resource for scientists striving to improve undergraduate education nationwide.