

February 2015

MEMORANDUM

To: Provosts, Deans, and STEM Department Chairs

From: Sean B Carroll, Ph.D. Vice President for Science Education 

Subject: HHMI/National Academies Summer Institutes for Undergraduate STEM Education

I write to inform you of an important opportunity. In collaboration with the National Academy of Sciences, HHMI sponsors a series of summer institutes to improve undergraduate STEM teaching. We have sponsored summer institutes since 2004. To date, 292 colleges and universities from across the United States have sent faculty and teaching staff to the institutes. I hope you will encourage members of your faculty and teaching staff to attend one in summer 2015. We are organizing six in the following regions: Gulf Coast, Midwest, Mountain West, Northeast, Southeast, and West Coast. Experienced co-leaders and participants lead each from previous institutes.

You are most likely aware of widespread concern about the quality and effectiveness of undergraduate STEM education. The National Research Council's *BIO 2010: Transforming Undergraduate Education for Future Research Biologists* reported that introductory science courses often supply little knowledge of contemporary science, and unfortunately, can actually discourage students from further science study. It recommended that university faculty explore new ways to teach. It also proposed that a summer institute on teaching be developed for faculty. The 2012 *Engage to Excel* report of the President's Council of Advisors on Science and Technology recommended the widespread adoption of empirically validated teaching practices and the training of current and future faculty in evidence-based teaching as key means to increasing the number of students pursuing majors and careers in STEM fields.

For the past 11 summers, HHMI and the National Academy of Sciences have partnered to conduct summer institutes on undergraduate science education. The institutes develop and disseminate more effective and empirically validated ways of teaching. We have found that even faculty and staff from campuses committed to delivering high-quality teaching can learn new instructional approaches and feel empowered by networking with like-minded teachers. Participants in the summer institutes consider the experience a great success; most of the approximately 1200 program alumni report that the training has permanently changed their teaching.

Professor Jo Handelsman, an HHMI professor* and member of Yale's MCDB faculty, was the first national co-director of the summer institutes. In 2014 she began an appointment for President Obama as Associate Director for Science in the Office of Science and Technology Policy. The summer institute program is coordinated by Dr. Jennifer Frederick and Dr. Mark Graham in the Yale Center for Teaching and Learning. Professor Handelsman describes the aims of the training program:

The goals of the summer institutes are: 1) to improve classroom teaching in the science by training instructors to develop and implement effective teaching methods; and 2) to attract more students to the sciences by training faculty and future faculty (graduate students and postdocs) to provide and outstanding undergraduate classroom and research laboratory experience. The institutes bring together teams of science educators for a five-day workshop. Teams are

comprised of both junior and senior instructors and may include faculty, instructional staff, department chairs or deans, postdocs, and graduate students. Each participant helps develop instructional materials designed to teach scientific thinking and concepts at the introductory level. In the academic year following the institutes, participants implement scientific teaching approaches in their courses, and the impact on faculty teaching and student learning is assessed in a nationwide experiment. The institutes' teaching methods model the inquiry-based approach they teach, providing ample opportunity for hands-on material development, discussion about teaching methods, and self-reflection about teaching styles and philosophies.

I encourage you to assemble a team that could contribute to and benefit from one of the summer institutes. Campuses are expected to fund travel expenses for their participants, minus a subsidy that the organizers provide, and to support the team afterwards in implementing new teaching strategies, conducting follow-up activities in their classes, and disseminating what they learned to their colleagues. All other institute expenses (materials, meeting spaces, IT) are borne by institute organizers. Additional information can be found at <http://www.nasummerinstitutes.org>.

At HHMI, we're very excited about the potential of the summer institutes to improve undergraduate STEM teaching and learning nationwide. In addition to providing hands-on experience with innovative teaching methods, the institutes build a national cohort on faculty and teaching staff interested in both productive research and quality teaching. We expect this growing network to be especially useful for junior faculty as they develop their careers.

* <http://www.hhmi.org/scientists/jo-handelsman>