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HHMI Gives 50 Early Career Scientists a Jump on Their Next Big Idea

Fifty of the nation's best early career science faculty will have more time and resources to focus on their boldest—and potentially transformative—research ideas with support from a new initiative from the Howard Hughes Medical Institute.

Each HHMI Early Career Scientist will receive a six-year appointment to the Institute and, along with it, the freedom to explore his or her best ideas without worrying about where to find the money to fund those experiments. HHMI's investment of approximately \$200 million will allow these researchers to concentrate on making discoveries in the laboratory and training the next generation of scientists.

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— Thomas R. Cech

HHMI will provide each Early Career Scientist with his or her full salary, benefits, and a research budget of \$1.5 million over the six-year appointment. The Institute will also cover other expenses, including research space and the purchase of critical equipment.

The selected scientists, who are at 33 institutions across the United States, have led their own laboratories for two to six years. During that time, many have made considerable contributions to biomedical research. Energetic and passionate about a broad range of scientific questions, this group of scientists is at a career stage that many consider to be a scientist's most productive—and most vulnerable.

In today's constrained research funding environment, many early career faculty find it difficult to establish and develop their research programs. They often launch their own labs with start-up funds from their host institution.

That support is provided with the expectation that the scientist will establish his or her own research program with independent funding.

The creativity and energy that researchers bring to starting their own labs can quickly be sapped by the time-consuming and often frustrating quest for funding. Within a few years of a new faculty appointment, a researcher's institutional start-up funds typically come to an end. Pressure to secure federal grant money may lead to "safe" grant proposals. As a result, creative and potentially transformative research projects may fall by the wayside.

In 2007, HHMI began to look for opportunities to diversify its research portfolio. As the Institute's scientific leadership considered where HHMI's resources could have the greatest impact, the answer was clear: The problems facing early career faculty had reached a point where the situation had become a threat to the vitality of the nation's biomedical research capabilities. The Institute decided to establish a new research program to provide much-needed support to some of the nation's best early career faculty at a time when they most need the help.

"We saw a tremendous opportunity for HHMI to impact the research community by freeing promising scientists to pursue their best ideas during this early stage of their careers," said HHMI President Thomas R. Cech. "At the same time, we hope that our investment in these 50 faculty will free the resources of other agencies to support the work of other outstanding early career scientists."

"The selection of these early career scientists is the first HHMI competition that I have actively participated in," said HHMI President-elect Robert Tjian, who will assume his new role on April 1. "Overall, I am very pleased the Institute has chosen to support the careers of these high-quality researchers."

In March 2008, HHMI unveiled its new Early Career Scientist program and announced a nationwide competition seeking applications from the nation's best early career scientists. Those working in all areas of basic biological and biomedical research and areas of chemistry, physics, computer science, and engineering that are directly related to biology or medicine were invited to apply. The competition drew more than 2,000 applicants. To maximize the impact of HHMI's support, individuals who were selected in the competition cannot hold more than one early career award from another agency or foundation.

In selecting the finalists, HHMI was guided by the same "people, not projects" philosophy that defines its investigator program. Like HHMI investigators, the Early Career Scientists will have the freedom to explore and, if necessary, change direction in their research.

The 50 scientists selected in the competition will use this freedom to take on a broad range of scientific challenges. Among the projects underway in their laboratories are the identification of the genes and mechanisms that control regeneration in flatworms and zebrafish, the development of stem cell models for neurodegenerative disease, mapping of the neural circuits that process

sensory information, and characterizing the forces that move cells to create new tissues and organs.

“These scientists are at the early stage of their careers, when they are full of energy and not afraid to try something new,” said Jack Dixon, HHMI vice president and chief scientific officer. “They have already demonstrated that they are not apt to play it safe—and we hope they will continue to do something really original.”

The newly selected scientists have let little stand in the way of their scientific curiosity. Many are taking interdisciplinary approaches and forging innovative collaborations to broaden the impact of their work. To tackle the scientific questions they consider most important, others have immersed themselves in fields in which they have never been formally trained—such as Columbia University’s Eric Greene, who taught himself the intricate techniques of single-molecule biophysics, which he now uses to study the behavior of individual DNA repair proteins.

When existing research tools have proved inadequate, some of these scientists have created their own. For example, more than 200 laboratories around the world are studying neural circuits in living animals with the aid of a technique Stanford University’s Karl Deisseroth created for turning on groups of neurons with a pulse of light. And in his quest to understand how tuberculosis bacteria keep themselves alive in their host, Christopher Sassetti at the University of Massachusetts Medical School invented a method of sifting through large quantities of genetic information to pinpoint genes that are essential for survival.

Similarly, when fruit flies, mice, and other traditional laboratory models have not suited their studies, these scientists have sought out model organisms that do: a spiny Canadian fish for insight into how species co-evolve with other organisms, lizards that reproduce asexually as a model for genetic diversity, and a shape-shifting bacteria for the study of cell-signaling circuitry.

The 41 men and 9 women will begin their six-year, nonrenewable appointments to HHMI in September 2009. The Institute anticipates a second Early Career Scientist competition in 2012.

The Howard Hughes Medical Institute

The Howard Hughes Medical Institute, a nonprofit medical research organization that ranks as one of the nation's largest philanthropies, plays a powerful role in advancing biomedical research and science education in the United States. In the past two decades HHMI has made investments of more than \$8.3 billion for the support, training, and education of the nation's most creative and promising scientists.

HHMI's principal mission is conducting basic biomedical research, which it carries out in collaboration with more than 60 universities, medical centers, and other research institutions throughout the United States. Approximately 350 HHMI investigators, along with a scientific staff of more than 2,000,

work at these institutions in Hughes laboratories. In a complementary program at HHMI's Janelia Farm Research Campus in Loudoun County, Virginia, leading scientists are pursuing long-term, high-risk, high-reward research in a campus specially designed to bring together researchers from disparate disciplines. The Institute's biomedical research expenditures during fiscal year 2008 totaled \$658 million.

HHMI researchers are widely recognized for their creativity and productivity: 124 HHMI investigators are members of the National Academy of Sciences, and there are currently 13 Nobel laureates within the investigator community.

The Institute also has a philanthropic grants program that emphasizes initiatives with the power to transform graduate and undergraduate education in the life sciences. Additionally, it supports the work of biomedical researchers in many countries around the globe. Through aggregate investments of more than \$1.2 billion, the Institute has sought to reinvigorate life science education at both research universities and liberal arts colleges and to engage the nation's leading scientists in teaching. HHMI grants totaled \$83 million in fiscal year 2008.

The HHMI endowment is reported on an annual basis and stood at \$17.5 billion at the start of the current fiscal year on September 1, 2008. Its headquarters are located in Chevy Chase, Maryland, just outside Washington, D.C.