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### Three New Howard Hughes Medical Institute Investigators Named

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PASADENA, Calif.--Every three years, the Howard Hughes Medical Institute (HHMI) appoints the nation's most creative biomedical scientists as investigators, giving them millions of dollars to unfetter their ambitious research plans. This year, three of the 56 newly named HHMI investigators come from the California Institute of Technology.

[Howard Hughes Medical Institute](#)

David Chan, Michael Elowitz, and Grant Jensen were each chosen for their potential to "bring new and innovative ways of thinking about biology to the HHMI community," says Thomas R. Cech, president of HHMI. "They are poised to advance scientific knowledge dramatically in the coming years, and we are committed to providing them with the freedom and flexibility to do so," he adds.

Chan, an associate professor of biology, specializes in how mitochondria--often called the powerhouses of biological cells--interact with each other. While this field, called mitochondrial dynamics, is still in its infancy, its implications are far-reaching. Chan has found that the loss of mitochondrial dynamics in mice, for example, leads to defects in placental tissue, in neurons in the cerebellum, and in skeletal muscle. He also studies the connection between accumulating damage in human mitochondria and the process of aging.

"I was surprised and very honored to be selected as an HHMI investigator. I am deeply grateful to advisors and colleagues who supported my career and encouraged me to apply," Chan says. "This appointment will help us to aggressively pursue ongoing projects in the lab, and also to expand into a couple of new, exciting areas in mitochondrial biology."

Biology and physics form a natural combination for Michael Elowitz, who builds genetic circuits and inserts them into living bacteria. The bacteria execute the tasks they are programmed to do, such as blinking on and off like a twinkling light. As an assistant professor of biology and applied physics and a Bren Scholar, Elowitz is fundamentally interested in how cells' own genetic circuits dictate what type of cells they become.

In work that overturned the steadfast notion that genes and networks of genes operate in a predictable and fixed fashion, he and his colleagues showed that key properties of the cell--like how actively it turns out different proteins--are intrinsically random. To show that randomness is used to more accurately control the shapes and patterns that make organisms work, Elowitz is turning to larger and more complex animal cells. "I'm grateful to HHMI for the amazing opportunity this appointment presents to focus as much as possible on research. The funds will enable us to explore new directions, especially allowing us to expand approaches we've previously developed primarily in bacteria to mammalian cells."

Assistant Professor of Biology Grant Jensen combines emerging electron microscope technologies with biology to image biological structures that could, until recently, only be imagined. One example of such a structure is the motor that drives the flagella of spirochete bacteria. Jensen has also shown key structures of proteins in HIV and has demonstrated that, contrary to long-held convictions, bacteria have a cytoskeleton.

Going beyond the static images, Jensen has created animations for biological processes. Applying the same technology used in movies, he showed the process of HIV maturation and bacterial motility. "It has been exciting to begin thinking of the additional research we will now be able to do," says Jensen of the award. "We're going to move more quickly now into complementing our current electron microscopical methods with light microscopy, and also begin modeling our hypotheses computationally."

The selection of Chan, Elowitz, and Jensen brings to 10 the total number of HHMI investigators at Caltech, eight of whom are among the 36 total faculty of the Division of Biology. The HHMI promotes its principle of "people, not projects" by appointing scientists as investigators, rather than awarding research grants. Investigators are urged to take risks, to explore unproven avenues, and to embrace the unknown, even if it means uncertainty or the chance of failure.

A nonprofit medical research organization, HHMI was established in 1953 by the aviator-industrialist Howard Hughes. The institute, headquartered in Chevy Chase, Maryland, is one of the largest philanthropies in the world, with an endowment of \$18.3 billion at the close of the 2007 fiscal year. HHMI spent \$599 million in support of biomedical research and \$86 million for support of a variety of grants programs in fiscal year 2007.

For more information on HHMI and this year's investigator's, please visit:  
<http://www.hhmi.org/news/20080527.html> ###

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