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MOLECULAR BIOLOGISTS MICHAEL GRUNSTEIN AND C. DAVID ALLIS SHARE \$500,000 GRUBER GENETICS PRIZE FOR THEIR PIONEERING WORK ON HISTONES AND GENE REGULATION



Michael Grunstein



C. David Allis

May 11, 2016, New Haven, CT – The 2016 Gruber Genetics Prize will be awarded this year to molecular biologists Michael Grunstein, PhD, of the University of California Los Angeles (UCLA), and C. David Allis, PhD, of The Rockefeller University. These two renowned scientists are receiving this prestigious award for their groundbreaking work in identifying the critical role of histones and histone modifications in regulating gene activity. Their discoveries transformed the field of molecular biology and were instrumental in launching the modern study of histones in epigenetics, with broad implications for human health and disease.

The award will be presented to Grunstein and Allis in Vancouver, Canada, on October 21 at the annual meeting of the American Society of Human Genetics.

“These two remarkable scientists showed us that genetic coding is not determined solely by our inherited DNA, but also by a direct interaction between that DNA and histones, the proteins in cell nuclei around which DNA is tightly bound,” says Huda Zoghbi, Investigator, Howard Hughes Medical Institute at Baylor College of Medicine and chair of the Selection Advisory Board to the Gruber Genetics Prize. “Not only has this work profoundly changed our understanding of gene regulation, but it has also greatly advanced our knowledge of medical conditions as varied as birth defects, heart disease and cancer.”

For many years, histones were long considered nothing more than the material that “packages” DNA into structures called nucleosomes, which are the building blocks of the chromatin complex that form chromosomes within the nucleus of eukaryotic cells. In the late 1980s, Grunstein demonstrated—for the first time—that histones perform highly specific roles in regulating gene transcription in living cells and that histones themselves are the direct targets of certain transcriptional regulatory proteins. A few years later, Allis and Grunstein identified specific enzymes that add or remove an acetyl chemical group to or from the tail of a histone molecule. These studies highlighted a role for histone acetylation in gene

activity. The results of these and other breakthrough discoveries by the two molecular biologists revolutionized the field of molecular genetics, for they demonstrated unequivocally that changes to the histones alter gene activity without affecting the DNA sequence.

“Drs. Grunstein and Allis were scientific pioneers,” says Helen Hobbs, Investigator, Howard Hughes Medical Institute at UT Southwestern and member of the Selection Advisory Board to the Prize. “They have elucidated how biochemical modifications of both histones and DNA impact on expression of genes. It is a great honor to be awarding them the Gruber Genetics Prize.”

Additional Information

In addition to the cash award, each recipient will receive a gold laureate pin and a citation that reads:

The Gruber Foundation proudly presents the 2016 Genetics Prize to Michael Grunstein and David Allis for the discovery of the role of histone proteins and their covalent modification in the regulation of eukaryotic gene expression.

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Laureates of the Gruber Genetics Prize:

- **2015: Emmanuelle Charpentier and Jennifer Doudna**, for establishing a framework for universal genome editing
- **2014: Victor Ambros, David Baulcombe, and Gary Ruvkun**, for pioneering the study of small non-coding RNA's, molecules that are recognized as playing a critical role in regulating gene expression
- **2013: Svante Pääbo**, for pioneering the analysis of ancient DNA
- **2012: Douglas C. Wallace**, for his groundbreaking contributions to mitochondrial genetics
- **2011: Ronald Davis**, for his pioneering development and application of recombinant-DNA techniques
- **2010: Gerald Fink**, whose work in yeast genetics advanced the field of molecular genetics
- **2009: Janet Davison Rowley**, for her seminal discoveries in molecular oncology
- **2008: Allan C. Spradling**, for his work on fly genomics
- **2007: Maynard V. Olson**, for his contributions to genome science
- **2006: Elizabeth H. Blackburn**, for her studies of telomeres and telomerase, and her science advocacy
- **2005: Robert H. Waterston**, for his pivotal role in the Human Genome Project
- **2004: Mary-Claire King**, for three major findings in modern genetics: the similarity of the human and chimpanzee genomes, finding a gene that predisposes to breast cancer, and forensic genetics.
- **2003: David Botstein**, a driving force in modern genetics who established the ground rules for human genetic mapping
- **2002: H. Robert Horvitz**, who defined genetic pathways responsible for programmed cell death
- **2001: Rudolf Jaenisch**, who created the first transgenic mouse to study human disease

The Prize recipients are chosen by the Genetics Selection Advisory Board. Its members are:

Victor Ambros, University of Massachusetts Medical School; **Utpal Banerjee**, University of California Los Angeles; **Marlene Belfort**, University at Albany, SUNY; **Kay Davies**, University of Oxford; **Helen Hobbs**, University of Texas Southwestern; **Richard Lifton**, Yale School of Medicine; and **Huda Zoghbi**, Baylor College of Medicine (Chair).

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By agreement made in the spring of 2011 The Gruber Foundation has now been established at Yale University.

The Gruber International Prize Program honors individuals in the fields of Cosmology, Genetics and Neuroscience, whose groundbreaking work provides new models that inspire and enable fundamental shifts in knowledge and culture. The Selection Advisory Boards choose individuals whose contributions in their respective fields advance our knowledge and potentially have a profound impact on our lives.

The Genetics Prize is presented to a leading scientist, or up to three, in recognition of groundbreaking contributions to any realm of genetics research.

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For more information on the Gruber Prizes, visit www.gruber.yale.edu, e-mail info@gruber.yale.edu or contact A. Sarah Hreha at +1 (203) 432-6231. By mail: The Gruber Foundation, Yale University, Office of Development, PO Box 2038, New Haven, CT 06521.

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