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FOR IMMEDIATE RELEASE



Ronald Davis

Biochemist and Geneticist Ronald W. Davis Receives the \$500,000 Gruber Genetics Prize for Pioneering Work in the Development of Biotechnologies that Have Significantly Advanced the Fields of Molecular Genetics and Genomics

June 8, 2011, New York, NY – Ronald W. Davis, PhD, a pioneer in innovative biotechnologies, particularly the development and practical application of recombinant DNA and genomic methods to biological organisms, will receive the 2011 Genetics Prize of The Peter and Patricia Gruber Foundation. The various techniques he developed have been indispensable in creating the biotech infrastructure that has driven many of the genetic discoveries of recent decades.

Davis, 69, has spent most of his professional life at Stanford University, where he is a professor of biochemistry and genetics. He also serves as director of the Stanford Genome Technology Center, a position he has held since 1994.

He will receive the award on October 13 in Montreal, during the annual meeting of the American Society of Human Genetics, which is being held in conjunction with the 12th International Congress of Human Genetics. Davis will also deliver a lecture at the conference.

“Ron Davis’ innovations have resulted in remarkable advances in modern molecular genetics. I am delighted that he is the 2011 Gruber Genetics Prize recipient” says Gruber and Nobel laureate Elizabeth Blackburn, the Morris Herzstein Professor of Biology and Physiology in the Department of Biochemistry and Biophysics at the University of California, San Francisco.

Davis’ impact on biomedical research has been broad and profound. In 1968, while still a graduate student at the California Institute of Technology, he developed one of the first mapping methods for DNA, as well as heteroduplex technology, which made imaging the pairing of two genomes possible. After he moved to Stanford in 1972, Davis created some of the earliest cloning vectors—DNA molecules that carry foreign DNA into a host cell, where the foreign DNA can then be replicated.

A string of other technologies and discoveries quickly followed. Working on the genome and biology of *Saccharomyces cerevisiae* (baker’s yeast), Davis’ lab developed the first artificially constructed chromosomes, which are now routinely used to clone large genes and to map complex genomes. In 1979, Davis co-authored a seminal paper that described the very first case of what is now known as genome editing, the ability to replace any nucleotide in the yeast genome with any other nucleotide.

In 1980, in another landmark paper—one of the most highly cited in the field of human genetics—Davis and his team described how sequence variants in the genomes of humans and other species could provide genetic



markers for making a genetic and physical map of the human genome. That paper helped launch the field of genomics. A few years later, Davis' lab showed how DNA libraries could be searched with protein-finding antibodies, a technique that has made it possible for scientists to identify genes for important proteins, including in humans.

During the 1990s, Davis contributed to the development of the very first microarrays, tools that enable scientists to analyze the gene expression of thousands of genes simultaneously. He then went on to help standardize this technology, paving the way for other scientists to use it for clinical applications. In recent years, his lab has produced sequences of several yeast chromosomes, part of the *Escherichia coli* genome, part of the *Arabidopsis thaliana* genome (*Arabidopsis* is a plant widely used in the study of genetics), part of the human genome, and part of the genome of *Plasmodium falciparum* (a parasite that causes malaria in humans). Davis also continues to develop new biotechnologies. DNA nanotechnology is a particular current focus.

"I really enjoy working on problems that others think are unsolvable," he says.

Additional Information

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

The Peter and Patricia Gruber Foundation proudly presents the 2011 Genetics Prize to Ronald W. Davis, a pioneer in the development and application of recombinant-DNA techniques.

*Davis discovered that the EcoRI restriction endonuclease generates "sticky" ends when it cleaves DNA and, based on this discovery, developed highly efficient systems for producing, propagating, and screening recombinant-DNA clones in *Escherichia coli*. This technology shaped later approaches to the study of the human and other genomes.*

*Using the yeast *Saccharomyces cerevisiae* as host, Davis designed recombinant-DNA molecules whose genetic behavior could be precisely controlled. During this work, he discovered the first eukaryotic replication origins, the autonomously replicating sequences, and carried out the first targeted deletion of a gene. Throughout his career—by training students, communicating openly with colleagues, and leading through the example of his own research—Davis has profoundly influenced the way scientists study the molecular basis of life.*

Laureates of the Gruber Genetics Prize:

- **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:

Elizabeth H. Blackburn, University of California, San Francisco; **Martin Chalfie**, Columbia University; **Mary-Claire King**, University of Washington; **Maynard Olson**, Genome Center, University of Washington; **Janet Rowley**, University of Chicago; **Allan C. Spradling**, Carnegie Institution, Howard Hughes Medical Institute; **Robert H. Waterston**, University of Washington.

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The Gruber International Prize Program honors contemporary individuals in the fields of Cosmology, Genetics, Neuroscience, Justice and Women’s Rights, 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, potentially have a profound impact on our lives, and, in the case of the Justice and Women’s Rights Prizes, demonstrate courage and commitment in the face of significant obstacles.

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The Peter and Patricia Gruber Foundation honors and encourages educational excellence, social justice and scientific achievements that better the human condition. For more information about Foundation guidelines and priorities, please visit www.gruberprizes.org.

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Media materials and additional background information on the Gruber Prizes can be found at our online newsroom: www.gruberprizes.org/Press.php.

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