



GRUBER FOUNDATION

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FOR IMMEDIATE RELEASE

CANCER GENETICIST JANET DAVISON ROWLEY TO RECEIVE \$500,000 GRUBER GENETICS PRIZE FOR GROUNDBREAKING DISCOVERIES IN IDENTIFYING CHROMOSOMAL ABNORMALITIES IN LEUKEMIAS AND LYMPHOMAS — FINDINGS THAT ESTABLISHED CANCER AS A GENETIC DISEASE



Janet Davison Rowley

July 1, 2009, New York, NY – **Janet Davison Rowley, MD**, a founder in the field of cancer cytogenetics and a renowned leader in molecular oncology, will receive the 2009 Genetics Prize of The Peter and Patricia Gruber Foundation. She is being honored with the prestigious international award for discoveries of recurrent chromosomal abnormalities in leukemias and lymphomas—discoveries that have revolutionized how cancer is understood and treated. Currently the Blum-Riese Distinguished Service Professor at the University of Chicago, Rowley is also being honored for her critical national and international leadership in the biomedical research community. The Prize will be presented in Honolulu, Hawaii, on October 23 at the 59th Annual Meeting of the American Society of Human Genetics.

"Janet Rowley's work established that cancer is a genetic disease," says Mary-Claire King, a geneticist at the University of Washington. "She demonstrated that mutations in critical genes lead to specific forms of leukemia and lymphoma, and that one can determine the form of cancer present in a patient directly from the cancer's genes. We are still working from her paradigm."

Before Rowley began investigations into the chromosomal abnormalities of leukemia at the University of Chicago in the 1960s, few scientists believed that chromosomal aberrations caused tumors. The established view at the time was that abnormal chromosomes were manifestations of the generalized chaos that exists within leukemia and lymphoma cells. But Rowley believed something else was going on with those damaged pieces of DNA, and diligently pursued their study.

"I became a kind of missionary, saying that chromosome abnormalities were important and hematologists should know about them," Rowley recalls of those early—and often lonely—years in the field. "I got sort of amused tolerance at the beginning."

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In the end, though, Rowley proved to be astonishingly prescient. Over the next decade, she made a number of remarkable discoveries, including the landmark finding that the abnormally short “Philadelphia” chromosome that had earlier been identified in hematopoietic cells of people with chronic myelogenous leukemia (CML) was not a chromosome deletion, as many scientists had thought, but an exchange (translocation) of segments between two chromosomes. She soon uncovered translocations in other types of leukemia and lymphoma cells, and then, as new technology became available, began to clone the translocation abnormalities, or breakpoints, of these chromosomes and to identify their oncogenes (the mutated genes that help transform a normal cell into a cancerous one). By 1980, she had redefined the field of cancer cytogenetics.

Rowley's contributions to identifying chromosomal abnormalities in leukemias and lymphomas have changed the way these diseases are diagnosed and treated. Today, such cytogenetic techniques as fluorescence *in situ* hybridization (FISH) and polymerase chain reaction (PCR) can identify the DNA damage within individual cells, offering a much more precise diagnosis of disease—and more effective treatments. For example, the development of the drug imatinib (Gleevec)—one of the most successful targeted cancer therapies to date—stems directly from Rowley's work on the chromosomal translocation associated with CML. Imatinib blocks the abnormal protein produced by that translocation.

Rowley's research continues at her lab at the University of Chicago, the institution where she received her undergraduate and medical degrees six decades ago and where she has inspired and generously mentored countless students and postgraduate fellows during the ensuing years. Cancer cytogenetics continues to fascinate—and challenge—her. “We're still working on the leukemias,” she says. “There's a lot of evidence that translocations and other chromosome abnormalities aren't sufficient to make a cell malignant. We're looking for the other mechanisms involved.”

“As Chair of this year's Selection Committee for the Gruber Prize in Genetics, I am delighted that the Committee recognized such a distinguished scientist and individual as Dr. Rowley,” says Elizabeth Blackburn, the Morris Herzstein Professor of Biology and Physiology in the Department of Biochemistry and Biophysics at the University of California, San Francisco. “Her major contributions to the understanding of the underpinnings of cancer make her an outstanding choice for this important Prize and truly reflect the goal of this Prize in celebrating the field of Genetics.”

Additional Information

The official citation reads:

The Peter and Patricia Gruber Foundation proudly presents the 2009 Genetics Prize to Janet Davison Rowley, M.D., a founder of the field of cancer cytogenetics and a renowned leader in molecular oncology.

Janet Rowley revolutionized research in the field of cancer biology and the diagnosis and treatment of cancer through her discoveries of specific chromosomal translocations in the leukemias and lymphomas. Dr. Rowley provided compelling evidence that particular tumors are associated with characteristic cytogenetic alterations.

By redefining our fundamental understanding of cancer through cytogenetics, she helped drive the translation of basic genetic discoveries to clinical medicine. In addition, during her illustrious career Dr. Rowley has provided critical leadership nationally and internationally to the biomedical research community.

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Laureates of the Gruber Genetics Prize:

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; **David Botstein**, Lewis-Sigler Institute; **H. Robert Horvitz**, Massachusetts Institute of Technology; **Mary-Claire King**, University of Washington; **Maynard Olson**, Genome Center, University of Washington; **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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