



**COLUMBIA UNIVERSITY
MEDICAL CENTER**

Discover. Educate. Care. Lead.


[Home](#)
[About CUMC](#)
[Research](#)
[Education](#)
[Patient Care](#)
[CUMC Newsroom](#)

Featured News and Events | [Index of press releases](#)

Contact:

Elizabeth Streich
(212) 305-6535
eas2125@columbia.edu

**Columbia Awards the 2009 Horwitz Prize to RNA Biologists
Victor Ambros & Gary Ruvkun
for their Discovery of microRNA – Critical to Gene Regulation**

NEW YORK (Oct. 20, 2009) –Columbia University will award the 2009 Louisa Gross Horwitz Prize to longtime collaborators Victor R. Ambros, Ph.D. and Gary Ruvkun, Ph.D., for their discovery of microRNAs (miRNAs) – small molecules that are critical to gene regulation. The awardees will give lectures about their discovery on November 17 at Columbia University ([details below](#)) – the lectures will be followed by an awards ceremony to mark this honor.

MicroRNAs are small molecules of RNA – single-strands of genetic material – which can regulate the expression of many genes. They were completely unknown before Dr. Ambros identified the first miRNA in the nematode worm *C. elegans* in 1993. Then in 2000, Dr. Ruvkun discovered a second microRNA in *C. elegans* and many other species, including humans – illuminating to scientists that miRNAs were not unique to *C. elegans*, as had been thought. It now appears that the human genome contains between 500 and 1,000 miRNA genes. Today these molecules are implicated in a broad range of normal and disease-related activities, and they have become important research targets for diseases including cancer, heart failure and diabetes.

"It is our privilege to award the 2009 Horwitz Prize to Drs. Ambros and Ruvkun, as recognition for their pioneering work in gene regulation," said Lee Goldman, M.D., executive vice president of Columbia University and dean of the faculties of health sciences and medicine at Columbia University Medical Center. "Their body of work illustrates the importance of collaboration in science – often a vital intellectual process that is not always visible."

"The knowledge these two scientists have given us about microRNAs and the role they play in gene regulation has laid the foundation for important scientific research and the potential for major breakthroughs in diseases that are among the most serious that our population faces. Their work also shows how fundamental genetic research leads, often unexpectedly, to profound applications that can benefit humans," said David Hirsh, Ph.D., executive vice president for research at Columbia University.

Collaboration of Drs. Ruvkun and Ambros Leads to RNA Discover

"The selection of Victor Ambros and Gary Ruvkun for this year's Horwitz Prize recognizes their scientific contribution on new understandings of our genetic code, our DNA, and how small portions of it may be involved in the formation of cancer and other chronic illnesses, including diabetes," said [Wayne A. Hendrickson, Ph.D.](#), chair of the Horwitz Prize Committee and University Professor of Biochemistry and Molecular Biophysics at Columbia University, and an [investigator of the Howard Hughes Medical Institute](#).

In the early 1980s, Drs. Ruvkun and Ambros were fellows in the Massachusetts Institute of Technology laboratory of Nobelist H. Robert Horvitz, investigating genes that control development in *C. elegans*. They worked together to isolate a gene called *lin-14* that operates in concert with the gene *lin-4* to regulate the worms' transition through key developmental stages.

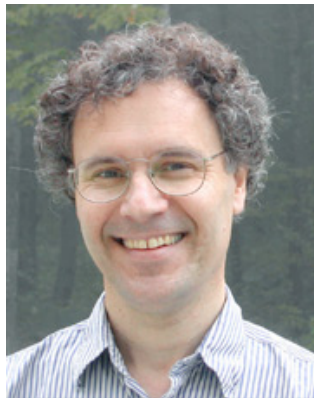
As the two researchers established their own laboratories – Dr. Ruvkun at Harvard and Massachusetts General Hospital, and Dr. Ambros at Harvard (he moved to Dartmouth in 1992 and then to the University of Massachusetts in 2008) – they continued collaborating to uncover how the two regulatory genes interact, and they made some surprising discoveries, including that *lin-4* did not encode a protein, as expected, but an extremely small, 22-nucleotide, RNA molecule, later dubbed a microRNA. They also discovered that the *lin-4* RNA blocked the activity of *lin-14* in a manner never seen before.

Since then, Dr. Ambros and others have identified a wide variety of genes for diverse miRNAs in animals and plants, raising new questions about gene regulation and expression. Today, Drs. Ambros and Ruvkun continue their research on miRNA function and gene regulation during development, and are focused on understanding the genetic and molecular mechanisms that control cell division, differentiation and morphogenesis in animals.

"Working with Gary Ruvkun has been one of the most stimulating adventures of my career. I feel incredibly fortunate to have collaborated with Gary for all these years, to have experienced with him the pleasure of discovery, and now to also share with him this prestigious honor," said Dr. Ambros, professor of molecular medicine at the University of Massachusetts Medical School.

"Even though we have not worked in the same laboratory since the early 1980s, my collaborative relationship with Victor Ambros has remained, and I am so grateful for this," said Dr. Ruvkun, professor of genetics at Harvard Medical School and Massachusetts General Hospital's Simches Research Center. "Our discussions have sparked new thinking for me, and have led to discoveries of which I am very proud."

Brief Biographies on Dr. Victor Ambros and Dr. Gary Ruvkun



[Victor Ambros, Ph.D.](#) completed his undergraduate and graduate degrees as well as his postdoctoral research at the Massachusetts Institute of Technology. During graduate school, he worked with David Baltimore, Ph.D., a co-recipient of the 1975 Nobel Prize in physiology or medicine, where he studied the poliovirus genome structure and replication. In 1979, he began his postdoctoral research in the lab of H. Robert Horvitz, who shared the 2002 Nobel Prize in physiology or medicine, where he met Dr. Ruvkun—and they began collaborating on research into the genetic pathways that control developmental timing in *C. elegans*. After completing his postdoctoral fellowship, in 1984, Dr. Ambros joined the faculty at Harvard where he remained until 1992, when he accepted a faculty position at Dartmouth. He joined the University of Massachusetts Medical School in 2007. Dr.

Ambros was elected to the National Academy of Sciences in 2007.



[Gary Ruvkun, Ph.D.](#) is a graduate of the University of California, Berkeley and Harvard. He is professor of genetics at Harvard Medical School. Dr. Ruvkun began to work with *C. elegans* as a postdoctoral student with Nobelist H. Robert Horvitz at MIT and Nobelist Walter Gilbert at Harvard, where he explored the heterochronic genes that control the temporal dimension of development in a collaborative study with Victor Ambros. The work led to the discovery of the first microRNA gene by the Ambros lab, and that the mechanism of microRNA regulation of target mRNAs is post-transcriptional by the Ruvkun lab. A few years later the Ruvkun lab found the second microRNA gene, *let-7* and showed that this microRNA gene is conserved across animal phylogeny. Dr. Ruvkun's team continues to study other mechanisms involved in the development, metabolism, and longevity of *C. elegans*,

including genes involved in the regulation and storage of fat. Dr. Ruvkun was elected to the

Institute of Medicine in 2009.

The Louisa Gross Horwitz Prize was established by Columbia University to recognize outstanding contributions to basic research in the fields of biology and biochemistry. Awarded annually since 1967, the prize is named for the mother of Columbia benefactor S. Gross Horwitz. Louisa Gross Horwitz was daughter of Dr. Samuel David Gross, author of "A System of Surgery" and a founder of the American Medical Association. For additional information about the Louisa Gross Horwitz Prize, visit: <http://www.cumc.columbia.edu/horwitz>.

The 2009 Louisa Gross Horwitz Prize Lectures will be held on Tuesday, Nov. 17. Dr. Ambros will give his lecture, "MicroRNAs in Development and Disease," at noon in the Davis Auditorium (rm. 412), Schapiro Center, 530 W. 120 Street, at Columbia University's Morningside Campus; and Dr. Ruvkun will give his lecture, "The Roles and Possibilities of Tiny RNAs," at 3:30 p.m. in the Alumni Auditorium, College of Physicians & Surgeons building, 650 W. 168 Street, at Columbia University Medical Center.

For more information about the lectures, visit <http://www.cumc.columbia.edu/events/deanlectures/>.

#

Columbia University Medical Center provides international leadership in basic, pre-clinical and clinical research, in medical and health sciences education, and in patient care. The medical center trains future leaders and includes the dedicated work of many physicians, scientists, public health professionals, dentists, and nurses at the College of Physicians & Surgeons, the Mailman School of Public Health, the College of Dental Medicine, the School of Nursing, the biomedical departments of the Graduate School of Arts and Sciences, and allied research centers and institutions. Established in 1767, Columbia's College of Physicians & Surgeons was the first institution in the country to grant the M.D. degree and is now among the most selective medical schools in the country. Columbia University Medical Center is home to the largest medical research enterprise in New York City and state and one of the largest in the United States. For more information, please visit www.cumc.columbia.edu.

Founded in 1754 as King's College, **Columbia University** in the City of New York is the fifth oldest institution of higher learning in the United States and today is one of the world's leading academic and research institutions. Columbia has more than 3,000 faculty members and enrolls nearly 24,000 students, including more than 5,000 international students. The University spans three undergraduate schools, 13 graduate and professional schools, a school of continuing education, four affiliated institutions, a world-class medical center, 22 libraries, and more than 100 research centers and institutes. For more information about Columbia University, visit www.columbia.edu.