



September 10, 2013

Announcement of the Keio Medical Science Prize 2013

Keio University annually awards the Keio Medical Science Prize to recognize researchers who have made an outstanding contribution to the field of medicine or life sciences. It is the only prize of its kind awarded by a Japanese university, and 6 laureates of this Prize have later won the Nobel Prize. The 18th Keio Medical Science Prize has been awarded to Victor R. Ambros, Ph.D. and Shigekazu Nagata, Ph.D.

1. Laureates

Victor R. Ambros, Ph.D.

Silverman Professor of Natural Science
Program in Molecular Medicine
University of Massachusetts Medical School
“Discovery of microRNAs as a new class of gene regulators”

Shigekazu Nagata, Ph.D.

Professor, Department of Medical Chemistry
Graduate School of Medicine, Kyoto University
“Molecular mechanism of apoptosis and its physiology”

2. Prize

Laureates receive a certificate of merit, medal, and a monetary award of 10 million yen. The award ceremony and commemorative lectures are held at Keio University.

3. Award Ceremony and Events

The award ceremony and commemorative lectures will be held on November 27, 2013 at the School of Medicine, Shinanomachi Campus, Keio University, Tokyo, Japan.

Award Ceremony and Commemorative Lectures

Date: November 27, 2013 14:00-17:30
Venue: *Kitasato* Hall, Shinanomachi Campus, Keio University, Tokyo, Japan
Language: English and Japanese
Simultaneous translation available (English-Japanese/Japanese-English)
Admission: Open to the public

*Please visit our website at <http://www.ms-fund.keio.ac.jp/prize/index.html> for more details.

Attachments: (1) Keio Medical Science Prize
(2) Keio Medical Science Prize Laureate 2013

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The Keio Medical Science Prize

1. Background

In fall 1994, Dr. Mitsunada Sakaguchi, a 1940 alumnus of the School of Medicine, donated five billion yen to Keio University, with the expressed desire that it be used to commend outstanding researchers, to encourage medical research and its creative progress at Keio through grants, and to promote worldwide medical advances. In keeping with Dr. Sakaguchi's commitment, Keio launched the Keio University Medical Science Fund on April 1, 1995. Dr. Sakaguchi made an additional donation of two billion yen in July 1999, bringing the fund to a total of seven billion yen.

2. Initiatives

- The Keio Medical Science Prize
- Grants for International Activities in Life Sciences and Medicine
- Medical School Faculty and Alumni Grants
- Research Grants for Life Sciences and Medicine
- The Sakaguchi Laboratory

3. Objective

The Keio Medical Science Prize gives recognition to the outstanding and creative achievements of researchers in the fields of medicine and life sciences, in particular those contributing to scientific developments in medicine. It aims to promote worldwide advances in life sciences and medicine, to encourage the expansion of researcher networks throughout the world, and to contribute to the well-being of humankind.

4. Prize

Laureates receive a certificate of merit, medal, and a monetary award of 10 million yen. The award ceremony and commemorative lectures are held at Keio University.

5. Nomination and Selection

Invitations are sent out to academics and researchers around the world each year, asking them to submit next year's candidates for the Prize. Eighty Japanese academics and researchers within and outside Keio University select laureates through a rigorous review process. The Keio Medical Science Prize is an international award.

6. 2012 Prize Laureates

Dr. Steven A. Rosenberg Development of Effective Immunotherapies for Patients with Cancer
Dr. Hiroyuki Mano Discovery of a lung cancer oncogene EML4-ALK and development of molecular targeted therapy

7. Nobel Prize Winning Laureates

2010 Dr. Jules A. Hoffmann (The Nobel Prize in Physiology or Medicine 2011)
 Discovery of insect-innate immune system and Toll receptor

2006 Dr. Thomas A. Steitz (The Nobel Prize in Chemistry 2009)
 Structural Basis of Large Ribosomal Subunit Function and Drug Development

2004 Dr. Roger Y. Tsien (The Nobel Prize in Chemistry 2008)
 Visualization and Control of Molecules within Living Cells

2002 Dr. Barry J. Marshall (The Nobel Prize in Physiology or Medicine 2005)
 Establishment of Diagnostic Techniques and Treatment for the Helicobacter Pylori

1999 Dr. Elizabeth Helen Blackburn (The Nobel Prize in Physiology or Medicine 2009)
 Telomeres and Telemerase

1996 Dr. Stanley B. Prusiner (The Nobel Prize in Physiology or Medicine 1997)
 Discovery of Prions and Prion Diseases



Keio Medical Science Prize Laureate 2013

“Discovery of microRNAs as a new class of gene regulators”

Victor R. Ambros, Ph.D.

Silverman Professor of Natural Science

Program in Molecular Medicine

University of Massachusetts Medical School

Dr. Victor R. Ambros first discovered microRNAs (miRNAs) in 1993 using molecular genetics of *C. elegans*. His group cloned the *lin-4* gene which affects the timing of developmental events by negatively regulating the LIN-14 protein levels. Surprisingly, the *lin-4* gene product turned out not to be a protein but rather a small 22-nucleotide RNA containing sequences complementary to the 3'UTR of *lin-14* mRNA, suggesting that *lin-4* regulates *lin-14* translation via a direct RNA-RNA interaction. Thousands of miRNAs have recently been found in many eukaryotes including humans, and miRNAs are shown to be linked to many diseases, including cancer and neurological diseases. The application of miRNAs to target disease genes and the technology to block action of miRNAs are emerging as new therapeutic approaches. Ambros' discovery of miRNA has thus overturned the traditional paradigms of the regulation of gene expression and opened up an exciting new field of research.

• Education

1979 Massachusetts Institute of Technology, Ph.D. Biology
 1975 Massachusetts Institute of Technology, S.B. Biology

• Professional Experience

2008-present Professor, Program in Molecular Medicine, University of Massachusetts Medical School
 2001-2007 Professor of Genetics, Dartmouth Medical School
 1996-2001 Professor, Department of Biological Sciences, Dartmouth College
 1992-1996 Associate Professor, Biological Sciences, Dartmouth College
 1988-1992 Associate Professor, Department of Cellular and Developmental Biology,
 Harvard University
 1985-1988 Assistant Professor, Department of Cellular and Developmental Biology, Harvard University
 1976-1979 Graduate Research Assistant. Supervisor: David Baltimore
 Postdoctoral Fellow, M.I.T. Supervisor: H. Robert Horvitz
 1975-1976 Research Assistant, M.I.T. Center for Cancer Research. Supervisor: David Baltimore

• Comments from Dr. Ambros

I feel deeply honored to be selected for the Keio Medical Science Prize. It is particularly gratifying that the selection committee has chosen to highlight a discovery that emerged from basic sciences research using the nematode *Caenorhabditis elegans*. Our research was conducted with the aim of achieving a better understanding of the genetic mechanisms that regulate the timing of events in animal development. The discovery of the microRNA product of the gene *lin-4* was a serendipitous result of those studies. I hope that this award will help to encourage other life scientists that by following their curiosity, they will be led towards novel and unexpected landscapes of knowledge.



Keio Medical Science Prize Laureate 2013

“Molecular mechanisms of apoptosis and its physiology”

Shigekazu Nagata, Ph.D.

Professor, Department of Medical Chemistry
Graduate School of Medicine, Kyoto University

Aged or abnormal cells are eliminated by the process of programmed cell death, named apoptosis. Apoptotic cells are engulfed by macrophages. Dr. Shigekazu Nagata first elucidated the molecular mechanism of a series of apoptotic reactions, and discovered the physiological significance of each process. He characterized the Fas-Fas ligand system and identified the DNA degradation enzymes that are involved in DNA fragmentation in apoptotic cells. He also showed that abnormality in those processes caused autoimmune diseases. More recently, he identified the molecules necessary for the recognition of apoptotic cells by macrophages, in which phosphatidylserine on the cell surface of apoptotic cells plays an important role. Notably, his group discovered the long-sought enzyme called scramblase, which is essential to expose phosphatidylserine on the cell surface. Dr. Shigekazu Nagata's continuous great contribution to the field of apoptosis well deserves the Keio Medical Science prize.

• Education

1968- 1972 Undergraduate in the Faculty of Science, University of Tokyo
1972- 1977 Graduate Student in the Institute of Medical Science, University of Tokyo

• Research and professional experience

1977- 1981 Post-Doctoral Fellow, Institute of Molecular Biology, University of Zürich
1982- 1987 Assistant Professor, Institute of Medical Science, University of Tokyo
1987- 1998 Head, Department of Molecular Biology, Osaka Bioscience Institute
1995- 2007 Professor, Department of Genetics, Osaka University Graduate School of Medicine
2002- 2007 Professor, Integrated Biology Laboratories, Graduate School of Frontier Biosciences,
Osaka University
2007-present Professor, Department of Medical Chemistry Graduate School of Medicine, Kyoto University

• Comments from Dr. Nagata

I am grateful to the selection committee for awarding me the Keio Medical Science Prize, by which I am greatly honored. This award recognizes our 25 years of efforts to understand the molecular mechanism of apoptosis and its physiological and pathological roles. I have been fortunate to share a number of exciting results with many talented colleagues at the Osaka Bioscience Institute, Osaka University, and Kyoto University. I also had pleasant collaborations with many scientists all over the world. My thoughts at this special moment go to those colleagues and collaborators.