

September 18, 2024  
Keio University

## Announcement of The Keio Medical Science Prize 2024

Keio University, Japan's oldest private university located in Tokyo, annually awards The Keio Medical Science Prize to recognize researchers who have made an outstanding contribution to the fields of medicine or the life sciences. It is the only prize of its kind awarded by a Japanese university, and 10 laureates of this prize have later won the Nobel Prize. The 29<sup>th</sup> Keio Medical Science Prize is awarded to **Sir Demis Hassabis** from Google DeepMind, and **Mitinori Saitou, M.D. Ph.D.**, from Kyoto University.

### 1. Laureates

#### Sir Demis Hassabis



Co-Founder and CEO  
Google DeepMind

**“Innovation in biomedical research  
through brain-inspired artificial intelligence”**

#### Mitinori Saitou, M.D., Ph.D.



Professor  
Kyoto University Institute for  
Advanced Study

Director  
Institute for the Advanced  
Study of Human Biology  
(WPI-ASHBi)

**“In vitro reconstitution of germ cell  
development”**

### 2. Award Events

The award ceremony and commemorative lectures will be held on November 20, 2024 at the Keio University School of Medicine, located on Keio University's Shinanomachi Campus.

#### Award Ceremony and Commemorative Lectures

Date & Time: Wednesday, November 20, 2024, 14:00-17:30

Venue: Kitasato Memorial Hall, Keio University School of Medicine, Shinanomachi Campus, Tokyo, Japan

Language: English

Admission: On-site participation is limited.

**For more information, please visit the Keio Medical Science Prize website:**

<https://www.ms-fund.keio.ac.jp/en/prize/>





## The Keio Medical Science Prize 2024 Laureate

**“Innovation in biomedical research through brain-inspired artificial intelligence”**

### **Sir Demis Hassabis**

Co-Founder and CEO  
Google DeepMind, UK

Sir Hassabis pioneered deep reinforcement learning, which combines deep neural networks with reinforcement learning based on the computational principles of the brain. He set a milestone in artificial intelligence with AlphaGo, which famously defeated the world champion in the game of Go. Furthermore, aiming to transform science through artificial intelligence, Sir Hassabis and his colleagues developed AlphaFold, a program that predicts protein structure from amino acid sequences using deep neural networks, which has had a revolutionary impact on biomedical research. Sir Hassabis’ work spans from basic science to generative models of languages and images, and toward the realization of general artificial intelligence inspired by the computational principles of the brain. This is expected to not only revolutionize biomedical research but also contribute to a richer human society.

#### **Education**

1994 - 1997 BA (Hons) in Computer Science (Double 1st Class), Queens’ College, University of Cambridge  
2005 - 2009 PhD in Cognitive Neuroscience, Institute of Neurology, University College London (UCL)

#### **Professional Appointments**

1993- 1998 Lead AI Programmer, Lead Designer, Bullfrog Productions; Lionhead Studios, Guildford  
1998- 2005 Founder & CEO, Elixir Studios, London  
2009- 2010 Wellcome Trust Postdoctoral Research Fellow, Gatsby Unit, UCL; McGovern Institute, MIT; Dept of Psychology, Harvard  
2010 -present Co-Founder & CEO, Google DeepMind

#### **Major Honors/Awards**

2022 BBVA Foundation Frontiers of Knowledge Award  
2022 Wiley Prize in Biomedical Sciences  
2023 Albert Lasker Award for Basic Medical Research  
2023 Canada Gairdner International Award  
2023 Breakthrough Prize in Life Sciences

#### **Comment from Sir Demis Hassabis**

I’m deeply honoured to receive the Keio Medical Science Prize. Inspired by human intelligence, I’ve dedicated my career to AI because of its potential to advance science and improve billions of lives. AlphaFold solved the 50-year grand challenge of protein structure prediction, and has been used by over 2 million researchers to advance critical work across biomedical science. I believe AI will be one of the most beneficial technologies ever, enabling cures for devastating diseases and delivering truly personalised medicine.



## The Keio Medical Science Prize 2024 Laureate

### “In vitro reconstitution of germ cell development”

#### Mitinori Saitou, M.D., Ph.D.

Professor, Kyoto University Institute for Advanced Study  
Director, Institute for the Advanced Study of Human Biology (WPI-ASHBi), Japan

The birth of new life begins with the fusion of reproductive cells, namely sperm and egg, which form a fertilized egg. The fertilized egg undergoes cell division, differentiating into various tissues and organs, gradually forming the human body. Remarkably, just two weeks after the fertilized egg is formed, preparation for the next generation begins, with primordial germ cells forming within the fetus. Dr. Saitou has succeeded in explaining this mysterious phenomenon of germ cell development, which has been repeated continuously throughout 2 million years of human history, at the molecular level. He discovered the molecules essential for this phenomenon and based on such knowledge, created sperm, eggs, and fertilized eggs from mouse iPS cells in vitro, and even succeeded in growing these into mice. Furthermore, in his research on humans, he has generated the cells preceding the sperm and eggs from iPS cells, leading the human in vitro gametogenesis research. His achievements pave the way to solve the ultimate challenge in biology—creating fertilized eggs from somatic cells—and thus deserve the Keio Medical Science Prize.

#### **Education**

1995 M.D. Faculty of Medicine, Kyoto University, Japan  
1999 Ph.D. Cell Biology, Graduate School of Medicine, Kyoto University, Japan

#### **Professional Appointments**

1996 Young Research Fellow (DC1), Japan Society for the Promotion of Science  
1999 Young Research Fellow (PD), Japan Society for the Promotion of Science  
2000 Travelling Research Fellow,  
Wellcome Trust/ Cancer Research UK Gurdon Centre for Developmental Biology and Cancer  
2003 Senior Research Associate,  
Wellcome Trust/ Cancer Research UK Gurdon Centre for Developmental Biology and Cancer  
2003 Team Leader, RIKEN Center for Developmental Biology  
2009- Present Professor, Graduate School of Medicine, Kyoto University  
2011- 2018 ERATO Research Director, Japan Science and Technology Agency  
2018- Present Guest Principal Investigator, Center for iPS Cell Research and Application, Kyoto University  
2018- Present Professor, Kyoto University Institute for Advanced Study  
2018- Present Director, Institute for the Advanced Study of Human Biology (WPI-ASHBi)  
2023- Present FOREST Program Officer, Japan Science and Technology Agency

#### **Major Honors/Awards**

2016 Takeda Prize for Medicine  
2019 Uehara Prize  
2019 The Asahi Prize  
2020 Imperial Prize and Japan Academy Prize  
2020 ISSCR Momentum Award

### **Comment from Mitinori Saitou, M.D. Ph.D.**

I am deeply honored and grateful to be selected as the recipient of the Keio Medical Science Prize. My research is driven by a profound interest in the mechanisms of germ-cell development, which are fundamental to the continuity of life. The intricate nature of these mechanisms and the ongoing emergence of new questions and possibilities continue to captivate me. Currently, my work is focused on understanding the mechanisms of human germ-cell development and achieving in vitro reconstitution of these cells. Encouraged by this award, I am committed to furthering my research to explore human development and disease origins while also advancing reproductive medicine and contributing to the foundational philosophy that underpins the field.



## **The Keio Medical Science Prize**

### **1. Background**

In the fall of 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 Medicine and the Life Sciences
- Keio Medical Science Rising Star Award
- Research Grants for Medicine and the Life Sciences
- 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 the life sciences, in particular those contributing to scientific developments in medicine. It aims to promote worldwide advances in medicine and the life sciences, encourage the expansion of researcher networks throughout the world, and 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 events and the commemorative lectures are held at Keio University.

### **5. Nomination and Selection**

The Keio Medical Science Prize is an international award, and each year academics and researchers from around the world are invited to nominate a candidate. Laureates are then selected through a rigorous review process by about eighty Japanese academics from both within and outside of Keio University.

#### **Selection Committee 2024**

Toshiro Sato	Chairperson of the Committee Professor, Department of Biochemistry, Keio University School of Medicine
Kiyokazu Agata	Director General, National Institute for Basic Biology
Shizuo Akira	Director, Center for Advanced Modalities and Drug Delivery System, Osaka University
Masayuki Amagai	Vice-President, Keio University Professor, Department of Dermatology, Keio University School of Medicine
Kenjiro Hanaoka	Professor, Division of Analytical Chemistry for Drug Discovery, Faculty of Pharmacy, Keio University
Kaori Hayashi	Professor, Department of Internal Medicine (Nephrology, Endocrinology and Metabolism),

Masaki Ieda	Keio University School of Medicine Professor, Department of Internal Medicine (Cardiology), Keio University School of Medicine
Yoshiaki Kubota	Professor, Department of Anatomy, Keio University School of Medicine
Hiroaki Mitsuya	Director General, National Center for Global Health and Medicine Research Institute
Ryozo Nagai	President, Jichi Medical University
Emi Nishimura	Professor, Division of Aging and Regeneration, The Institute of Medical Science, The University of Tokyo
Tetsuo Noda	Representative Director, Executive Director, and Institute Director, Japanese Foundation for Cancer Research
Haruhiko Siomi	Professor, Department of Molecular Biology, Keio University School of Medicine
Yoshiko Takahashi	Professor, Department of Zoology, Graduate School of Science, Kyoto University
Kenji Tanaka	Professor, Division of Brain Sciences, Institute for Advanced Medical Research, Keio University School of Medicine
Masashi Yanagisawa	Director, International Institute for Integrative Sleep Medicine (WPI-IIS), University of Tsukuba
Motoko Yanagita	Professor, Department of Nephrology, Graduate School of Medicine, Kyoto University

#### 6. **Nobel Prize Winners from the Keio Medical Science Prize Laureates**

1996	Stanley B. Prusiner (The Nobel Prize in Physiology or Medicine 1997) Discovery of Prions and Prion Diseases
1999	Elizabeth Helen Blackburn (The Nobel Prize in Physiology or Medicine 2009) Telomeres and Telomerase
2002	Barry J. Marshall (The Nobel Prize in Physiology or Medicine 2005) Establishment of Diagnostic Techniques and Treatment for Helicobacter Pylori
2004	Roger Y. Tsien (The Nobel Prize in Chemistry 2008) Visualization and Control of Molecules within Living Cells
2006	Thomas A. Steitz (The Nobel Prize in Chemistry 2009) Structural Basis of Large Ribosomal Subunit Function and Drug Development
2010	Jules A. Hoffmann (The Nobel Prize in Physiology or Medicine 2011) Discovery of Insect-innate Immune System and Toll Receptors
2015	Yoshinori Ohsumi (The Nobel Prize in Physiology or Medicine 2016) Discoveries of Mechanisms for Autophagy
2016	Tasuku Honjo (The Nobel Prize in Physiology or Medicine 2018) Identification of PD-1 and Establishment of Cancer Immunotherapy Principle by PD-1 Blockade
2016	Svante Pääbo (The Nobel Prize in Physiology or Medicine 2022) Molecular Elucidation of Human Origin
2022	Katalin Karikó (The Nobel Prize in Physiology or Medicine 2023) Discovery of Specific RNA Modification Leading to mRNA Vaccine Development

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#### **Contact:**

**Office of the Keio University Medical Science Fund**

TEL: +81-3-5363-3609 FAX: +81-3-5363-3215 k-msf@adst.keio.ac.jp <https://www.ms-fund.keio.ac.jp/en/prize/>

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**Office of General Affairs, Keio University School of Medicine**

TEL: +81-3-5363-3611 FAX: +81-3-5363-3612 med-koho@adst.keio.ac.jp <https://www.med.keio.ac.jp/en/>