

## Keynote Lectures

19 September 2016 | 10:30 – 11:30

Tagungs- und Kongresszentrum Reinhardtstraßenhöfe

### CRISPR RNA-guided genome editing in human stem cells, animals, and plants

Jin-Soo Kim, *Institute for Basic Science, Seoul*

Dr. Kim is an entrepreneur and chemist-turned-biologist. A graduate from Seoul National University, he continued his academic career in prestigious institutions in Korea and the US. He was also co-founder and CEO/CSO of a biotechnology company. He now serves as Director of the Center for Genome Engineering at the Institute for Basic Science. He has published over 80 articles and filed 30 patent applications, mostly in the field of gene regulation and genome editing. Throughout his independent scientific career since 1997, Dr. Kim has been developing tools for genome editing, a method now used widely in biomedical research, biotechnology, and medicine.

19 September 2016 | 18:00 – 19:30

Landesvertretung Sachsen-Anhalt

### CRISPR-Cas9: a game changer in genome engineering: origins and overview

Emmanuelle Charpentier, *Max Planck Institute for Infection Biology, Berlin*

Dr. Charpentier is a French microbiologist, biochemist and geneticist. Currently, she is Director at the Max Planck Institute for Infection Biology in Berlin, Alexander von Humboldt Professor, Professor at Humboldt University and Visiting Professor at Umeå University, Sweden. Dr. Charpentier is an expert in regulatory mechanisms underlying processes of infection and immunity in bacterial pathogens. With her recent groundbreaking findings in the field of RNA-mediated regulation based on the CRISPR-Cas9 system, she has laid the foundation for the development of a novel, highly versatile and specific genome editing technology that is revolutionizing life sciences research and could open up whole new opportunities in biomedical gene therapies.

The German National Academy of Sciences **Leopoldina** brings together the expertise of some 1,500 distinguished scientists to bear on questions of social and political relevance, publishing unbiased and timely scientific opinions. The Leopoldina represents the German scientific community in international committees and pursues the advancement of science for the benefit of humankind and for a better future.

As the leading science institution of the country, **The Korean Academy of Science and Technology (KAST)** plays the integral role in strengthening the foundation of science and technology and in preparing to meet the challenges of future needs of our nation and the global society.

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## Genome Editing in Germany and Korea

Joint Academies' Symposium of the German National Academy of Sciences and the Korean Academy of Science and Technology (KAST)

19 – 20 September 2016

Berlin

Kindly register until 14 September 2016:

[www.leopoldina.org/de/symposium-genome-editing](http://www.leopoldina.org/de/symposium-genome-editing)

[www.leopoldina.org](http://www.leopoldina.org)



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## Leopoldina-KAST Symposium “Genome Editing in Germany and Korea”

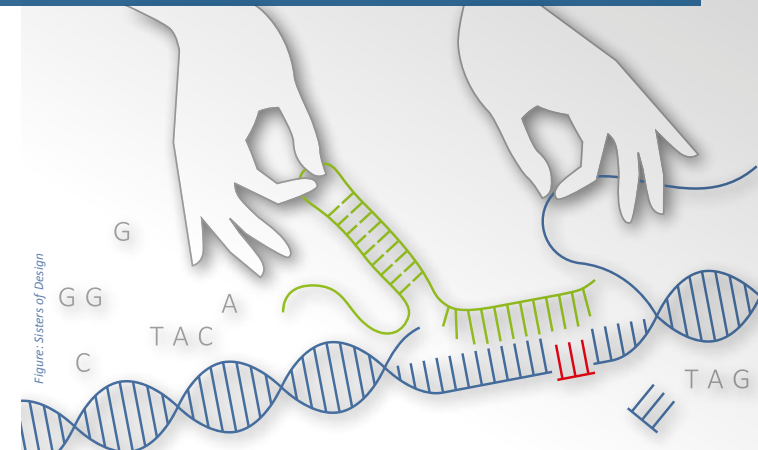
In May 2012, the German National Academy of Sciences Leopoldina and the Korean Academy of Science and Technology (KAST) signed a Memorandum of Understanding, thus highlighting their strategic partnership. Within the framework of this cooperation agreement, high-profile joint symposia on topics of high scientific, global and social relevance have been organized on a regular basis.

The fourth Leopoldina-KAST bilateral symposium will be dedicated to the discussion of key issues in the field of genome editing, focusing on technology development and the application of genome editing tools in plants, animals and for therapeutic purposes.

Modern molecular techniques, often referred to as “genome editing”, are currently revolutionizing molecular biology research. Technologies such as CRISPR-Cas9 allow for surprisingly simple, controlled gene modifications that are more efficient than the previously available methods. This opens up a new scope for molecular biological basic research, particularly into organisms that were not previously accessible for molecular genetic purposes, and for elucidating poorly understood gene functions. It also allows for far-reaching applications, from new options for plant breeding and biotechnology to somatic gene therapy for human genetic diseases. Focused basic research is still necessary. At the same time, a safe and responsible application of genome editing should be ensured respecting the needs of humanity and the environment.

Renowned scientists from Germany and South Korea will address current trends in these fields of research and discuss possible options for future scientific cooperation. Keynotes will be delivered by Prof. Dr. Jin-Soo Kim, Seoul, and Prof. Dr. Emmanuelle Charpentier, Berlin.

The symposium is organized under the joint leadership of Leopoldina members Ulla Bonas, Bärbel Friedrich, and Ernst-Ludwig Winnacker. Conceptual support was also provided by Jens Boch. On the Korean side, KAST members Ook Joon Yoo and Sukhan Lee, as well as Jin-Soo Kim jointly took the scientific lead.



# Programme

## Monday, 19 September 2016

Tagungs- und Kongresszentrum Reinhardtstraßenhöfe

### 09:30 – 10:00 | Registration

### 10:00 – 10:15 | Welcome Addresses

Jörg Hacker, *President Leopoldina*  
Myung Chul Lee, *President KAST*

### 10:15 – 10:25 | Introduction

Bärbel Friedrich, *Member of the Leopoldina Experts Committee on Genome Editing and of the Leopoldina Presidium*

### Morning Keynote (Tagungs- und Kongresszentrum Reinhardtstraßenhöfe)

### 10:25 – 10:30 | Introduction

Sukhan Lee, *Vice President KAST*

### 10:30 – 11:30 | Keynote Lecture

**CRISPR RNA-guided genome editing in human stem cells, animals, and plants**

Jin-Soo Kim, *Institute for Basic Science, Seoul*

### 11:30 – 11:35 | Group Photo

### 11:35 – 12:00 | Coffee Break

## Session 1: Technology Development

### 12:00 – 12:45

#### The tale of TALE(N)s

Ulla Bonas, *University of Halle, Vice President Leopoldina*

### 12:45 – 13:30

#### Design of highly specific or highly flexible TALE DNA-binding domains

Jens Boch, *Leibniz University Hannover*

### 13:30 – 14:30 | Lunch Break

### 14:30 – 15:15

#### The different flavors of antiviral defense

Lennart Randau, *Max Planck Institute for Terrestrial Microbiology, Marburg*

### 15:15 – 16:00

#### Designer recombinases for genome surgery

Frank Buchholz, *TU Dresden*

### 16:00 – 16:30 | Coffee Break

### 16:30 – 17:15

#### The Korean perspective: profiling of CRISPR-Cpf1 activity based on target sequence composition

Hyung Bum Kim, *Yonsei University, Seoul*

### Evening Keynote (Landesvertretung Sachsen-Anhalt)

### 18:00 – 18:15 | Welcome Address & Introduction

Jörg Hacker, *President Leopoldina*  
Ernst-Ludwig Winnacker, *LMU Munich*

### 18:15 – 19:30 | Keynote Lecture

#### CRISPR-Cas9: a game changer in genome engineering: origins and overview

Emmanuelle Charpentier, *Max Planck Institute for Infection Biology, Berlin*

### 20:00 | Conference Dinner (invitees only)

Käfer Dachgarten Restaurant, Platz der Republik 1, 11011 Berlin

## Tuesday, 20 September 2016

Tagungs- und Kongresszentrum Reinhardtstraßenhöfe

## Session 2: Applications in Plants

### 09:00 – 09:45

#### Site-directed genetic modification of cereal crops

Jochen Kumlehn, *Leibniz Institute of Plant Genetics and Crop Plant Research Gatersleben*

### 09:45 – 10:30

#### DNA-free genome editing in plants

Sunghwa Choe, *Seoul National University*

### 10:30 – 11:00 | Coffee Break

## Session 3: Applications in Animals

### 11:00 – 11:45

#### Efficient CRISPR/Cas9-mediated knock-out in mice

Dae-Yeul Yu, *Korea Research Institute of Bioscience and Biotechnology, Daejeon*

### 11:45 – 12:30

#### Editing of mouse and human genomes using CRISPR/Cas

Ralf Kühn, *Max-Delbrück-Center for Molecular Medicine, Berlin*

### 12:30 – 13:30 | Lunch Break

## Session 4: Therapeutic Applications

### 13:30 – 14:15

#### Targeted gene editing in hematopoietic stem cells to treat chronic immunodeficiencies

Toni Cathomen, *University of Freiburg*

### 14:15 – 15:00

#### Genome editing as a novel approach targeting vision-threatening retinopathy: beyond anti-VEGF aptamers & antibodies

Jeong Hun Kim, *Seoul National University*

### 15:00 – 15:15 | Coffee Break

## Genome Editing: Future Perspectives

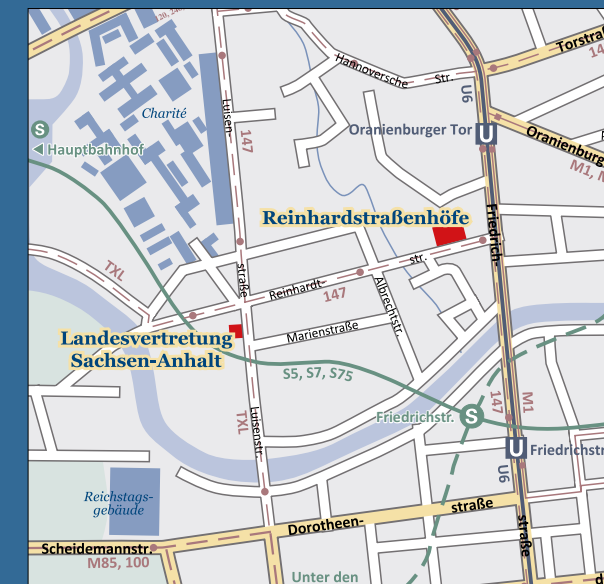
### 15:15 – 16:00 | Panel Discussion

#### Panel discussion with all speakers

#### Chairs:

Ernst-Ludwig Winnacker, *LMU Munich and Member of the Leopoldina Experts Committee on Genome Editing*  
Jin-Soo Kim, *Institute for Basic-Science, Seoul*

# How to get there



## Venues

### Symposium:

Tagungs- und Kongresszentrum Reinhardtstraßenhöfe  
Reinhardtstraße 14  
10117 Berlin  
[www.reinhardtstrassen-hoefe.de](http://www.reinhardtstrassen-hoefe.de)

### Evening Keynote:

Landesvertretung Sachsen-Anhalt  
Luisenstraße 18  
10117 Berlin  
[www.lv.sachsen-anhalt.de/nc/landesvertretung](http://www.lv.sachsen-anhalt.de/nc/landesvertretung)