

Conference Programme

# Advances in Brain Research

7<sup>th</sup> KAST-Leopoldina Bilateral Symposium

28 – 29 June 2023 | Halle (Saale)



# Programme

**Wednesday, 28 June 2023**

**09:30 – 10:00**      **Registration**

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**10:00 – 10:30**      **Opening Session**

**Welcome Remarks**

Gerald Haug ML  
*President of the Leopoldina*

Ook-Joon Yoo  
*President of KAST*

**Introductory Remarks by the Scientific Coordinators**

Hans Schöler ML  
*Max Planck Institute for Molecular Biomedicine, Münster*

Bong-Kiun Kaang  
*Department of Biological Sciences, Seoul National University*

**10:30 – 12:00**      **Keynote Session**

**The Cerebral Cortex, a Delay Coupled Oscillator Network:  
Computations in High Dimensional Dynamic Space**

Wolf Singer ML  
*Ernst Strüngmann Institute (ESI) for Neuroscience in Cooperation with the  
Max Planck Society, Frankfurt/Main*

**Reactive Astrocytes as the Cause of Alzheimer's Disease**

Changjoon Justin Lee  
*Center for Cognition and Sociality, Institute for Basic Science (IBS), Daejeon*

**12:00 – 13:00**      **Group Photo and Lunch Break**

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**13:00 – 15:00**      **Session 1: Progress in Understanding the Fundamental Functions  
of the Human Brain (I)**

**Cerebral Cortex Connectomics**

Moritz Helmstaedter  
*Max Planck Institute for Brain Research, Frankfurt/Main*

**Cell-Type Specific Connectivity Mapping and Cellular Profiling**

Jinhyun Kim  
*Brain Science Institute, Korea Institute of Science and Technology (KIST),  
Seoul*

**The Short and Long of Inhibition**

Hannah Monyer ML  
*Department of Clinical Neurology, Medical Faculty of Heidelberg University  
German Cancer Research Center (DKFZ) of the Helmholtz Association*

**Synchronization of Neuronal Networks at High Speed**

Dietmar Schmitz ML  
*Charité Universitätsmedizin Berlin*

15:00 – 15:15      **Coffee and Tea Break**

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15:15 – 16:15      **Session 1: Progress in Understanding the Fundamental Functions of the Human Brain (II)**

**Understanding Pain: Insights from the Brain and Artificial Intelligence**

Choong-Wan Woo

*Center for Neuroscience Imaging Research, Department of Biological Sciences, Sungkyunkwan University, Suwon*

**Dopaminergic Control of Compulsive Eating: Role of Dopamine D2 Receptor**

Ja-Hyun Baik

*Department of Life Sciences, Korea University, Seoul*

16:15 – 16:30      **Coffee and Tea Break**

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16:30 – 18:30      **Session 1: Progress in Understanding the Fundamental Functions of the Human Brain (III)**

**Enhancer RNAs in Brain Plasticity**

Tae-Kyung Kim

*Department of Life Sciences, Pohang University of Science and Technology (POSTECH)*

**Neural Processing Beyond Reinstatement During Memory Retrieval in the Human Brain**

Sue-Hyun Lee

*Department of Psychology, Seoul National University*

**Modeling Human Brain Development and Disease in Stem Cell Derived 3D Culture**

Jürgen Knoblich

*IMBA – Institute of Molecular Biotechnology, Vienna, Austria*

**Discussion**

## Thursday, 29 June 2023

09:00 – 09:05      **Welcome Remarks**

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Ulla Bonas ML

*Vice-President of the Leopoldina*

09:05 – 11:00      **Session 2: New Research Avenues – From Stem Cell Research and Organoids to Artificial Intelligence-Assisted Brain Science**

**Creation of Forebrain Assembloids to Recapitulate the Dynamic Cellular Interactions in the Human Schizophrenia Brain**

Kunwoo Shin

*Department of Biological Sciences, Seoul National University*

ML - Member of the Leopoldina

**Machine Learning and AI for the Sciences: Toward Understanding**

Klaus-Robert Müller ML

*Berlin Institute for the Foundations of Learning and Data (BIFOLD)*

**Biomedical Integrated Circuits and Systems for Brain Engineering**

Chul Kim

*Department of Bio and Brain Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon*

**Discussion**

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**11:00 – 11:15**      **Coffee and Tea Break**

**11:15 – 12:15**      **Session 3: Advances in the Diagnosis and Treatment of Brain Disorders (I)**

**Genetic Architecture of the Restless Legs Syndrome**

Juliane Winkelmann ML

*Helmholtz Munich, Institute of Neurogenomics*

*Klinikum rechts der Isar der Technischen Universität München,*

*Institute of Human Genetics*

**Brain Somatic Mutations in Intractable Focal Epilepsy**

Jeong Ho Lee

*Graduate School of Medical Science and Engineering, Korea Advanced*

*Institute of Science and Technology (KAIST), Daejeon*

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**12:15 – 13:30**      **Lunch Break and Guided Tour of Leopoldina Building**

**13:30 – 15:30**      **Session 3: Advances in the Diagnosis and Treatment of Brain Disorders (II)**

**Reduced Penetrance of Hereditary Movement Disorders:  
Elucidating Mechanisms of Endogenous Disease Protection**

Christine Klein ML

*University of Luebeck*

**Using Cerebral Organoids to Map the Impact of Prenatal Stress  
on Brain Development: Consequences for Psychiatry**

Elisabeth Binder ML

*Max Planck Institute of Psychiatry, Munich*

**Development of New Tools to Study Autophagy**

Jin-A Lee

*Department of Biopharmaceutical Engineering,*

*Hannam University, Daejeon*

**Discussion**

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**15:30 – 15:45**      **Coffee and Tea Break**

**15:45 – 16:30**      **Concluding Discussion and Closing Remarks**

Bong-Kiun Kaang

*Department of Biological Sciences, Seoul National University*

Hans Schöler ML

*Max Planck Institute for Molecular Biomedicine, Münster*

### Conference Venue:

Lecture Hall, German National Academy of Sciences Leopoldina  
Jägerberg 1, 06108 Halle (Saale), Germany

The **Korean Academy of Science and Technology** is an authoritative academic organization comprised of Korea's leading science and technology scholars. It was established as a purely private organization in 1994 to lay the foundation of promoting Korea's science and technology community. KAST supports policy research and advisory activities of scholars in science and technology for the development of basic science in Korea and the creation of a healthy R&D eco-system. It also performs science education and cultural activities to nurture future talent. Additionally, through exchanges and cooperation with overseas academies, KAST plays a crucial role in science and technology private diplomacy, and works towards ensuring that science and technology contribute to the common good of humankind.

The **Leopoldina** is a classical scholarly society and has 1,600 members from almost all branches of science. In 2008, the Leopoldina was appointed as the German National Academy of Sciences and, in this capacity, was invested with two major objectives: representing the German scientific community internationally, and providing policymakers and the public with science-based advice.