



# INTERNATIONAL SYMPOSIUM on NEURAL DEVELOPMENT and DISEASES

SUPPORTED BY MEXT RESEARCH PROGRAM

**Date: March 15-17, 2023**  
**Venue: Shiran Kaikan, Kyoto University**

## Speakers

Taiji Adachi  
Victor Borrell  
Zhou Chuying  
Ionut Dumitru  
Mototsugu Eiraku  
Ikumi Fujita  
Yukiko Gotoh  
Carina Hanashima  
Jun Hatakeyama  
Akane Hatsuda  
Tatsumi Hirata  
Naoki Honda

Itaru Imayoshi  
Nada Jabado  
Sebastian Jessberger  
Ryoichiro Kageyama  
Ayano Kawaguchi  
Mineko Kengaku  
Arnold Kriegstein  
Tomoki Matsuda  
Fumio Matsuzaki  
Guo-li Ming  
Goichi Miyoshi  
Adrian Moore

Kazunori Nakajima  
Chiaki Ohtaka-Maruyama  
Koji Oishi  
Ana Pombo  
Noriaki Sasai  
Makoto Sato  
Kazunobu Sawamoto  
Hongjun Song  
Pierre Vanderhaeghen  
Quan Wu



脳構築における発生時計と場の連携

Interplay of developmental clock and  
extracellular environment in brain formation

MARCH  
15 Wed

**Chair: Carina Hanashima**

- 9:00 Opening remarks – Ryoichiro Kageyama
- 9:10 Mineko Kengaku
- 9:35 Hongjun Song
- 10:15 - Coffee break -
- 10:35 Fumio Matsuzaki
- 11:00 Arnold Kriegstein
- 11:40 Jun Hatakeyama
- 12:05 - Lunch @Restaurant Shiran -

**Chair: Itaru Imayoshi**

- 13:30 Noriaki Sasai
- 13:55 Ana Pombo
- 14:35 Yukiko Gotoh
- 15:00 - Coffee break -
- 15:30 Chiaki Ohtaka-Maruyama
- 15:55 Nada Jabado
- 16:35 Ayano Kawaguchi
- 17:00 Carina Hanashima
- 17:25 Ikumi Fujita
- 17:40 Koji Oishi
- 18:00 - Cocktail party @Restaurant Shiran -

MARCH  
16 Thu

**Chair: Mineko Kengaku**

- 9:00 Adrian Moore
- 9:25 Makoto Sato
- 9:50 Victor Borrell
- 10:30 - Coffee break -
- 10:50 Kazunori Nakajima
- 11:15 Pierre Vanderhaeghen
- 12:00 - Lunch @Restaurant Shiran -

**Chair: Ryoichiro Kageyama**

- 13:30 Mototsugu Eiraku
- 13:55 Guo-li Ming
- 14:35 Goichi Miyoshi
- 15:00 - Coffee break -
- 15:30 Itaru Imayoshi
- 15:55 Sebastian Jessberger
- 16:35 Tatsumi Hirata
- 17:00 Taiji Adachi
- 17:25 Naoki Honda
- 17:40 Akane Hatsuda
- 18:00 - Dinner @Nanzenji -

MARCH  
17 Fri

**Chair: Mototsugu Eiraku**

- 9:00 Kazunobu Sawamoto
- 9:25 Ionut Dumitru
- 10:05 Quan Wu
- 10:20 - Coffee break -
- 10:50 Zhou Chuying
- 11:05 Tomoki Matsuda
- 11:30 Ryoichiro Kageyama
- 11:55 - Closing remarks -
- 12:00 - Business Lunch @Restaurant Shiran -

# **Analysis of neural stem cell regulatory mechanisms using optogenetics**

**Itaru Imayoshi**

*The Graduate School of Biostudies, Kyoto University  
Institute for Life and Medical Sciences, Kyoto University  
JAPAN*

The mammalian brain consists of a complex ensemble of neurons and glial cells. Their production during development and remodeling is tightly controlled by various regulatory mechanisms in neural stem cells. Among such regulations, basic helix-loop-helix (bHLH) factors have key functions in the self-renewal, multipotency, and fate determination of neural stem cells. Here, we highlight the importance of the expression dynamics of bHLH factors in these processes. We propose the multipotent state correlates with oscillatory expression of several bHLH factors, whereas the differentiated state correlates with sustained expression of a single bHLH factor. We also developed new optogenetic methods that can manipulate gene expressions in neural stem cells by light. We used this technology to manipulate the growth and fate-determination of neural stem cells. We are also analyzing dynamic changes in downstream gene expressions and cellular states caused by systematic light-induced manipulations of bHLH transcription factors.