

## Collaborative Activities with Universities and Research Institutes in Japan

### NIBB-Institute of Low Temperature Science (ILTS), Hokkaido University

#### *Accomplishment of the NIBB Priority Collaborative Research Project*

##### ■ Project Title:

Molecular and physiological mechanisms for understanding mammalian hibernation and their comparative analysis among species

##### ■ Co-Principal Investigators:

Prof. Yoshifumi Yamaguchi (ILTS)

Prof. Toshihiko Fujimori (NIBB)

Prof. Shuji Shigenobu (NIBB)

### NIBB-Institute of Molecular Embryology and Genetics (IMEG), Kumamoto University

#### *International Online Seminar by IMEG, Kumamoto University*

IMEG at Kumamoto University has been holding a series of monthly seminars called “IMEG Seminar Series - The road to global science -” as part of its activities at the International Advanced Research Center. As part of the collaboration agreement between IMEG and NIBB, NIBB members has participated in this seminar series.

##### ■ Seminar series:

2021 May: Jacqueline Tabler (Max Planck Institute of Molecular Cell Biology and Genetics, Germany)

2021 June: Vikas Trivedi (EMBL Barcelona)

2021 July: Patrick PL Tam (University of Sydney, Australia)

2021 Aug: Eran Meshorer (The Hebrew University of Jerusalem, Israel)

2021 Sep: Jacob H. Hanna (Weizmann Institute of Science, Israel)

2021 Oct: Kathy Niakan (The Francis Crick Institute and the University of Cambridge, UK)

2021 Nov: Xin Chen (Johns Hopkins University, Howard Hughes Medical Institute, USA)

2021 Dec: Peter K. Todd (University of Michigan, USA)

2022 Jan: Peter S. Zammit (King's College London, UK)

2022 Feb: John B. Wallingford (University of Texas at Austin, USA)

2022 Mar: Qi-Long Ying (University of South California, USA)

### NIBB-Institute of Advanced Medical Sciences (IAMS), Tokushima University

#### *NIBB- IAMS, Tokushima University, joint seminar “Toward Strengthening Collaboration and Cooperation”*

Following the collaboration agreement between NIBB and IAMS, a joint seminar was held on October 22, 2021, to strengthen cooperation and budding new collaborative research between the two institutions. The seminar introduced the facilities and equipment of both institutes, as well as efforts for their joint usage/research programs. A total of 76 people attended the seminar, 49 from NIBB and 27 from IAMS.

After the seminar, an opinion exchange meeting was held with the participation of directors and faculty from both sides. They actively discussed future cooperation and col-

laboration in joint usage/research programs, the exchange of technologies and methods in which both sides have strengths, and training and exchanging of staff involved in the implementation and operation of the joint usage/research programs. This would be the first step toward deepening cooperation between NIBB and IAMS and leading to the development of collaborative research and joint usage/research programs between the two institutes in the future.

##### ■ Seminar information:

Presentation from NIBB

Kiyokazu Agata (Introduction of NIBB)

Shuji Shigenobu (Introduction of NGS and mass spectrometry analyses)

Yasuhiro Kamei (Introduction of bioimaging analysis)

Eiji Watanabe (Introduction of model animal research facility)

##### ■ Presentation from IAMS

Hidetaka Kosako (Introduction of mass spectrometry analysis)

Tomohide Saio (Introduction of nuclear magnetic resonance (NMR) analysis)

Yosuke Matsushita (Introduction of NGS analysis)

Tatsuya Takemoto (Introduction of genome editing analysis)

### NIBB-Institute for Molecular and Cellular Regulation, Gunma University

#### *Agreement of Cooperation with IMCR, Gunma University*

NIBB and IMCR at Gunma University have signed an agreement of cooperation which is deemed effective from April 7, 2021. To prevent the further spread of COVID-19 infection, the signing ceremony was held in a remote capacity via an online connection between Maebashi and Okazaki.



Dr. Kiyokazu Agata, the Director-General of NIBB, and Dr. Ken Sato, the Director of IMCR, signing the agreement.

This agreement aims to promote mutual collaborative activities in the capacity of research and education centers that lead the way in world class, cutting edge research in the field of endocrinology, metabolism research and basic biology, as well as to utilize the results of these activities for research on a mutual basis. It also strengthens the support infrastructure for collaborative use and research nationwide, and to stimulate international academic exchange.

As part of the collaboration agreement, Director-general Kiyokazu Agata and Prof. Takashi Ueda present their research activities in the 7th IMCR Symposium that was held at September 9-10.

## NIBB-Chubu University

### *The 3rd Chubu University-NIPS-NIBB joint seminar "AI to Life System"*

NIBB and NIPS have been promoting exchanges of personnel and information with Chubu University through joint seminars on the theme of "AI to Life System" since the fall of 2021, aiming for emergence through interdisciplinary research and the discovery and cultivating of young researchers. The first joint seminar was hosted by Chubu University in November 2021, and the 2nd seminar was organized by NIPS in January 2022.

On March 28, 2022, NIBB organized the 3rd joint seminar held as a hybrid meeting with Zoom online system at the Okazaki Conference Center. In addition to the lectures of ongoing research utilizing AI analysis methods at each institute, a small group discussion was held to promote new collaborative research between the three institutes. The group discussions were divided into two categories, "technology" and "science". In each category, four topics were set up, and researchers and students discussed each topic separately. This event helped to deepen mutual understanding between information science and life science, and promoted the budding of collaboration research leading to the "elucidation of life systems using AI."



Opening remarks by Dr. Kiyokazu Agata, the Director-General of NIBB.



Group discussion on the topics of gene and protein.

- Seminar information
  - Lectures
    - Takashi Ueda (NIBB)
    - Junichi Chikazoe (NIPS)
    - Seine Shintani (Chubu University)
  - Group discussion
    - 1) Technology: Computer vision, Robotics, fMRI, and Electron Microscopy.
    - 2) Science: Gene and protein, Cell, Brain and sensory, and Brain and behavior.

## The NIBB Genome Informatics Training Course

The NIBB Core Research Facilities regularly organizes a series of training courses on the most recently developed research techniques. The NIBB Genome Informatics Training Course (GITC) is specially designed for biologists who are unfamiliar with bioinformatics. In 2021, we held two sets of training courses on RNA-seq analysis. Each version of the RNA-seq analysis course was basically made up of two 2-day programs: one being a preparatory course (Introduction to NGS Analysis) concerning the basics of UNIX and R, and the other a practical course (Introduction to RNA-seq) for learning about the pipelines to RNA-seq analysis using next-generation sequencing data. These GITC courses offered lectures and hands-on tutorials. This year, all courses were held online to prevent the spread of COVID-19 infection. By virtue of the online system, we expanded the course audiences by accepting some of them as "auditors" who could receive only limited support during the hands-on practice.

### Introduction to RNA-seq: From the Basics of NGS to de novo Analyses

- Organizers: Dr. Shuji Shigenobu and Dr. Ikuo Uchiyama (NIBB Core Research Facilities)
- Lecturers: Dr. Shuji Shigenobu, Dr. Ikuo Uchiyama, Dr. Masanao Sato (Hokkaido Univ.), Dr. Katsushi Yamaguchi, Ms. Hiroyo Nishide, Mr. Takanori Nakamura, Mr. Hiroki Sugiura (NIBB Core Research Facilities)

August 25 (Thu)–26 (Fri), 2021

(Practical Course) Introduction to NGS Analysis: Basics of UNIX, R, and NGS

- 31 participants and 16 auditors (including 2 from NIBB)
- Program:
  1. UNIX for Beginners
  2. Introduction to "R"
  3. Introduction to Statistics
  4. NGS Basic Data Formats and NGS Basic Tools
  5. Editor and Scripts
  6. Text Processing
  7. Exercises

September 15 (Thu)–16 (Fri), 2021

(Practical Course) RNA-seq Analysis Pipeline

- 28 participants and 16 auditors (including 3 from NIBB)
- Program:
  1. Introduction to RNA-seq
  2. NGS Basic Data Format and Basic Tools
  3. Visualization of NGS Data
  4. RNA-seq Pipelines: Genome-Based and Transcriptome-Based Approaches
  5. Multivariate Statistics
  6. Functional Annotation and Gene Ontology
  7. Exercises