## Workshop Program

### 1WA

**Theme**: 35th Anniversary of Protein Engineering since 1983  
**Organizers**: Satoshi Akanuma (Waseda Univ.), Ryoichi Arai (Shinshu Univ.)  
**Outline**: This year marks the 35th anniversary since Kevin Ulmer proposed “Protein Engineering”. In this workshop, the history of Protein Engineering from its dawn will be revisited. In addition, the developments and future prospects in the related research area will be openly discussed to innovate a new generation of Protein Engineering.  
**Speakers**: Tairo Oshima (Kyowa Kako Co., Ltd.), Munehito Arai (The Univ. of Tokyo), Shun Hirota (NAIST), Yuki Ohmuro-Matsuyama (Tokyo Tech), Satoshi Akanuma (Waseda Univ.)  
*Several oral presentations will be chosen from the posters*

### 1WB

**Theme**: Breakthrough of structural biology brought by advanced technology of SACLA  
**Organizers**: Eiichi Mizohata (Osaka Univ.), Eriko Nango (RIKEN)  
**Outline**: X-ray free electron lasers (XFELs) are fourth-generation light sources that have become available only recently. The development of XFEL-based structural analysis has brought about an era in which the conformational change that occurs when a protein functions can be visualized with atomic resolution and fast time resolution. In this workshop, we introduce methods of structural analysis with XFEL, an industrial application research, and latest results of dynamic structural biology.  
**Speakers**: Eriko Nango (RIKEN), Keitaro Yamashita (RIKEN), Mizuki Takahashi (DAIICHI SANKYO RD NOVARE CO., LTD.), Yoshitaka Bessho (Academia Sinica), Takehiko Tosha (RIKEN), Tomohiro Nishizawa (The Univ. of Tokyo)  
*Oral presentations will NOT be chosen from the posters*

### 1WC

**Theme**: Structure-Based Drug Discovery to Regulate Physiological Function  
**Organizers**: Chojiro Kojima (Yokohama National University), Hidekazu Hiroaki (Nagoya University)  
**Outline**: Physiologically active substances have been an important research target of biology for a long time. In recent years, advanced techniques for structural biology and drug discovery have been developed and open a new era of functional regulation by chemicals. In this workshop, we discuss current status and future presenting the latest researches.  
**Speakers**: Chojiro Kojima (Yokohama National University), Hidekazu Hiroaki (Nagoya University), Tatsuya Sawasaki (Ehime University), Kohji Murase (The University of Tokyo)  
*Several oral presentations will be chosen from the posters*

### 1WD

**Theme**: Calorimetry of immunological proteins including therapeutic antibodies  
**Organizers**: Susumu Uchiyama (Osaka Univ.), Masayuki Oda (Kyoto Pref. Univ.)  
**Outline**: Calorimetry is an effective method for studying protein-protein interactions and protein stabilities from thermodynamic point of view. In this workshop, we will focus on the proteins related to immunological functions and presenters will demonstrate interpretation of obtained thermodynamic parameters and the relation to protein structure.  
**Speakers**: Susumu Uchiyama (Osaka Univ.), Naoya Shinozaki (Daiichi Sankyo Co., Ltd.), Satoru Nagatoishi (The Univ. of Tokyo), Masayuki Oda (Kyoto Pref. Univ.), Satomi Inaba (JASRI), Masato Kiyoshi (NIHS)  
*Oral presentations will NOT be chosen from the posters*

### 1WE

**Theme**: Protein aggregation and membrane-less organelles  
**Organizers**: Yoshitaka Nagai (Osaka Univ.), Yutaka Kuroda (Tokyo Univ. Agr. Tech.)  
**Outline**: In the past twenty years, protein aggregation has developed into an important research field because of its implication in drug discovery and life phenomena. Protein solubilization technology of amorphous aggregates has recently attracted much attention because of the high concentrations used in the formulation of therapeutic protein formulations and industrial enzymes. A new paradigm of cell biology has recently been proposed, where proteins and peptides naturally aggregates inside cells would form “membrane-less organelles”. In this workshop, we will discuss new concepts of protein aggregation from biophysical, biochemical and medical viewpoints as well as “membraneless organelle”.  
**Speakers**: Yuji Goto (Osaka Univ.), Vladimir Uversky (University of South Florida), Osamu Onodera (Niigata Univ.), Yoshitaka Nagai (Osaka Univ.), Masato Kato (University of Texas Southwestern Medical Center), Yutaka Kuroda (Tokyo Univ. Agr. Tech.)  
*Oral presentations will NOT be chosen from the posters*
### Day 2 June 27 (Wed.) 16:00-18:30 (tentative)

#### 2WA

**Theme**  
Third APPA/PS/PSSJ Joint Workshop – IPR Seminar: Protein Science in the Asia Pacific Region: Building Understanding and Collaboration  
**Session Language:** English

**Organizers**  
Jisunson Svasti (Chulabhorn Research Institute), James Ketudat Cairns (Suranaree Univ. Tech.), Satoshi Takahashi (Tohoku Univ.), Yuji Goto (Osaka Univ.)

**Outline**  
The Asia Pacific Protein Association grew out of the desire of the Protein Science Society of Japan to build knowledge and interaction among protein scientists in the Asia Pacific region. Last year, at the 5th APPA Conference in Thailand, protein communities from 3 more countries joined APPA, making a total of 16 protein communities. As such, this Third APPA-PSSJ Workshop and IPR Seminar would showcase the success of this organization by providing a forum for young and experienced protein scientists who have become involved in the Asia Pacific Protein Association. Studies on protein structure, function and applications from the Asia Pacific region will be described by current APPA council representatives, with a special emphasis on the participation of junior council members and those who have recently joined the APPA.

**Speakers**  
Jisunson Svasti (Chulabhorn Research Institute)  
Pimchai Chaiyen (Vidyasirimedhi Institute of Science and Technology)  
Joe Yoon Ho Sup (Nanyang Technological University)  
Syed Abid Ali (University of Karachi)  
Md. Abu Reza (University of Rajshahi)  
Erina Lee (La Trobe University)  
Ming Lei (Ninth People’s Hospital, Shanghai Jiaotong University School of Medicine, Shanghai Institute of Precision Medicine)  
Weontae Lee (Yonsei University)  
David Hsiao (Academia Sinica)  
Truong Quoc Phong (Hanoi University of Science and Technology)

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#### 2WB

**Theme**  
From protein research to medical and medical technology collaboration  
**Session Language:** Japanese

**Organizers**  
Koh Nakata (Niigata Univ. & Dent. Hosp.), Daisuke Tokita (Niigata Univ. & Dent. Hosp.)

**Outline**  
Basic research on proteins has led to clinical research, drug seeds have been advanced, and collaboration between medicine and engineering has activated. We invite researchers who are realizing “bench-to-bedside” from various approach and discuss issues and prospects.

**Speakers**  
Takeshi Ikeuchi (Niigata Univ.), Masaaki Komatsu (Niigata Univ.), Makoto Oishi (Niigata Univ.), Manabu Natsumeda (Niigata Univ.), Suguru Yamamoto (Niigata Univ. & Dent. Hosp.), Kenya Kamimura (Niigata Univ.)

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#### 2WC

**Theme**  
Protein science under multimolecular crowding biosystems  
**Session Language:** Japanese

**Organizers**  
Itaru Hamachi (Kyoto Univ.)

**Outline**  
In nature, protein molecules show a variety of functions under multimolecular crowding biosystems such as live cells or tissues. In this workshop, we introduce tools, molecules and methods for analysing and controlling proteins structure and functions in such complicated natural environments.

**Speakers**  
Itaru Hamachi (Kyoto Univ.), Akio Ojida (Kyushu Univ.), Eri Chatani (Kobe Univ.), Shinya Hagihara (Nagoya Univ.), Kazuhiro Tabata (The Univ. of Tokyo)  
**Oral presentations will NOT be chosen from the posters**

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#### 2WD

**Theme**  
Development and Application of Research Tools for Analysis of Developmental Dynamics  
**Session Language:** Japanese

**Organizers**  
Ryoichiro Kageyama (Kyoto Univ.), Tomoki Matsuda (Osaka Univ.)

**Outline**  
During tissue formation, gene expression dynamically changes to precisely control cell proliferation, differentiation, and migration. To understand the significance of such gene expression dynamics, various research approaches, such as live imaging, simulation, and optogenetic methods, have been developed. In this workshop, we show and discuss research progress made by using such research tools.

**Speakers**  
Tomoki Matsuda (Osaka Univ.), Akihiro Isomura (Kyoto Univ.), Taiji Adachi (Kyoto Univ.), Kazuki Horikawa (Tokushima Univ.), Kazuhiro Aoki (NIBB)  
**Several oral presentations will be chosen from the posters**

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#### 2WE

**Theme**  
Visualization of all atoms leads to understanding the characteristics of macromolecules  
**Session Language:** Japanese

**Organizers**  
Min Yao (Hokkaido Univ.), Taro Tamada (QST)

**Outline**  
Visualization of all atoms using several techniques and quantum beams (mainly neutron) will lead us to the essential understanding of the characteristics of macromolecules. In this workshop, we will show the latest results in this field and discuss its future view.

**Speakers**  
Toyoyuki Ose (Hokkaido Univ.), Shinya Fushinobu (The Univ. of Tokyo), Masaki Unno (Ibaraki Univ.), Sono Sasaki (Kyoto Institute of Technology), Masaru Tateno (Univ. of Hyogo)  
**Several oral presentations will be chosen from the posters**
Day 3 June 28 (Thu.) 9:00–11:30 (tentative)

**3WB**

**Theme:** Protein aggregation and anti-aggregation  **[Session Language: English]**

**Organizers:** Kenji Sugase (Kyoto Univ.), Yasushi Kawata (Tottori Univ.)

**Outline:** There is a growing interest in protein stability in cellular (mimicking) environments. Crowded environments and hydrodynamic forces supposedly affect protein stability but the mechanism is not yet thoroughly understood. In this workshop, we discuss various factors affecting protein stability, focusing on protein (anti-)aggregation.

**Speakers:** Daichi Morimoto (Kyoto Univ.), Yasushi Kawata (Tottori Univ.), Yuji Sugita (RIKEN), Motomasa Tanaka (RIKEN), Erik Walinda (Kyoto Univ.)  
*Several oral presentations will be chosen from the posters*

**3WC**

**Theme:** Mechanisms of biological energy metabolism systems revealed by high resolution and dynamic structural studies  **[Session Language: Japanese]**

**Organizers:** Jian-Ren Shen (Okayama Univ.), Hideki Taguchi (Tokyo Institute of Technology), Kenji Sugase (Kyoto Univ.), Yasushi Kawata (Tottori Univ.)

**Outline:** Energy is indispensable for all lives, and various organisms have gained various energy-acquisition systems. In this workshop, world-class researchers will introduce their up-to-date results on the major energy metabolism systems including photosynthesis and respiration that are achieved by the use of high-resolution and dynamic structural studies of large membrane-protein complexes.

**Speakers:** Tomitake Tsukihara (Univ. of Hyogo), Yoshitsugu Shiro (Univ. of Hyogo), Yoshiki Higuchi (Univ. of Hyogo), Michi Suga (Okayama Univ.), Long-Jiang Yu (Okayama Univ.)  
*Oral presentations will NOT be chosen from the posters*

**3WD**

**Theme:** Expanding the Protein World: Beyond Anfinsen’s Dogma  **[Session Language: Japanese]**

**Organizers:** Hideki Taguchi (Tokyo Institute of Technology)

**Outline:** Because it is only in the very recent years that our current conception regarding protein folding and the definition of open reading frames (ORFs) began to be recognized as being narrower than what the reality may be, there remains a largely unexplored field in and around translation process, the final information flow in the central dogma of molecular biology. This workshop aims to introduce recent advances in new field of protein science, expanding protein world.

**Speakers:** Hideki Taguchi (Tokyo Institute of Technology), Nobuyasu Koga (Institute for Molecular Science), Toshifumi Inada (Tohoku University)  
*Several oral presentations will be chosen from the posters*

**3WE**

**Theme:** Progress in the study on the mechanism of intramolecular information-transmission of protein  **[Session Language: Japanese]**

**Organizers:** Yasushige Yonezawa (Kindai Univ.), Naoyuki Miyashita (Kindai Univ.)

**Outline:** Allostery is the common biological role of proteins, which allows membrane proteins to share common biological role. Namely, they dynamically transfer information through proteins. In this workshop, forefront experimental and theoretical researchers introduce their works with respect to dynamic information transferring mechanism though protein, overlooking this exiting research area.

**Speakers:** Kouta Katayama (Nagoya Institute of Technology), Hiroko Kondou (Hiroshima City Univ.), Keisuke Saito (The Univ. of Tokyo), Takuma Shiraki (Kindai Univ.), Kouhei Takeshita (Osaka Univ.)  
*Several oral presentations will be chosen from the posters*

**3WBp**

**Theme:** Protein misfolding diseases looking through the lens of reverse viewpoint  **[Session Language: English]**

**Organizers:** Naomi Hachiya (TIRI), Noriko Fujiwara (Hyogo Coll. Med.)

**Outline:** Misfolding or accumulation of proteins are the molecular etiology of various protein misfolding diseases. This simple and important concept has not been enough discussed from the viewpoint of protein chemistry and clinical aspect. Researchers from different background gathered in this session, and have discussions that build new bridges of understanding.

**Speakers:** Naomi Hachiya (TIRI), Noriko Fujiwara (Hyogo Coll. Med.), Ryo Endo (RIKEN), Tomonori Kimura (NIBIOHN), Hiroki Miyahara (Shinshu Univ.), Yoshifumi Iwamaru (NARO), Masayuki Yamasaki (Ryukoku Univ.)  
*Several oral presentations will be chosen from the posters*

**3WCp**

**Theme:** Synthetic biology of Membrane proteins  **[Session Language: English]**

**Organizers:** Tomyo Matsuura (Osaka Univ.), Ai Niitsu (RIKEN)

**Outline:** Synthetic biology involves designing novel biological molecules and systems. In protein science, it includes protein design and engineering, and evolutionary molecular engineering. This workshop focuses on the challenging target, membrane protein. Presenters including young researchers will share their latest research in computational design, artificial evolution, and cell dynamics control.

**Speakers:** Ai Niitsu (RIKEN), Patrick Barth (Swiss Federal Institute of Technology), Yoshiaki Yano (Kyoto Univ.), Satoshi Teda (University of California, San Francisco), Tomyo Matsuura (Osaka Univ.)  
*Several oral presentations will be chosen from the posters*

**3WDp**

**Theme:** In-cell measurement techniques of biomacromolecules and beyond  **[Session Language: English]**

**Organizers:** Daisuke Kohda (Kyushu Univ.), Noritaka Nishida (The Univ. of Tokyo)

**Outline:** It is still a challenging task to measure the 3D structures and dynamics of biomacromolecules, such as proteins, within living cells. Currently, in-cell NMR method and cryo-electron tomography are highly promising to achieve this goal. We will overview recent technical advances and applications of those measurement techniques to discuss their future prospects.

**Speakers:** Takuyo Yasunaga (Kyushu Institute of Technology), Saeko Yanaka (NINS), Yutaka Ito (Tokyo Metropolitan Univ.), Takashi Nagata (Kyoto Univ.), Kohsuke Inomata (RIKEN)  
*Several oral presentations will be chosen from the posters*
About 30% of total proteins perform physiological functions only after correctly acquiring metal ions. In order to understand essential roles of protein-metal interactions in life, we will compare in vivo dynamics between the “biometals” enabling metalloproteins to be functional and the “harmful metals” expressing toxicity to us.

Several oral presentations will be chosen from the posters.