

## Workshops

WS1	June 16 (Wed) 18:00-20:30 (tentative)	<Session Language: Japanese>
Oral presentations will NOT be chosen from the free papers		
New trends of protein science in multimolecular crowding biosystems		
Organizers: Itaru Hamachi (Kyoto Univ.), Akio Ojida (Kyushu Univ.)		
Speakers: Noritaka Nishida (Chiba Univ.), Satoshi Arai (Kanazawa Univ.), Toru Komatsu (The Univ. of Tokyo), Masaki Okumura (Tohoku Univ.), Yoichi Otsuka (Osaka Univ.), Akio Ojida (Kyushu Univ.)		
Proteins function under multimolecular crowding biosystems such as cells and biological tissues, in which many biomolecules are mixed in a complex and exist at high concentration. In this symposium, we introduce the new molecular tools and technologies, which are useful for structure and functional analyses, and functional control of proteins existing under the complicated biological systems. We also discuss future trends of protein science exploring these useful tools and technologies.		
WS2	June 16 (Wed) 18:00-20:30 (tentative)	<Session Language: Japanese>
Several oral presentations will be chosen from the free papers		
PSSJ Archives WS: Novel NMR techniques for diversified protein analysis		
Organizers: Daichi Morimoto (Kyoto Univ.), Tomoki Matsuda (Osaka Univ.)		
Speakers: Izuru Kawamura (Yokohama National Univ.), Kenji Sugase (Kyoto Univ.), Teppei Ikeya (Tokyo Metropolitan Univ.), Koh Takeuchi (AIST), Yoh Matsuki (Osaka Univ.)		
NMR method allows the analysis of proteins at the atomic resolution and over a wide time scale, whereas it is not possible to acquire images directly and the measurement is complicated. However, novel information on the structural and physical properties can be obtained by elaborating on the measurement techniques. Here, we introduce methods for measuring intact protein samples, such as intracellular measurement, measurement of large samples, and sensitivity-enhanced signal detection, as well as methods for perturbing systems such as light irradiation and stirring, as the cutting-edge next-generation NMR method.		
WS10	June 16 (Wed) 18:00-20:30 (tentative)	<Session Language: Japanese/English>
Several oral presentations will be chosen from the free papers		
Frontiers in Bio-metal science: the roles of metals in life		
Organizers: Yuta Amagai (Tohoku Univ.) , Takeshi Yokoyama (Tohoku Univ.)		
Speakers: Yuta Amagai (Tohoku Univ.) , Makoto Nakakido (The Univ. of Tokyo), Chai Gopalasingam (Hyogo Pref. Univ.), Yukina Nishito (Kyoto Pharm. Univ.) Yoshiaki Furukawa (Keio Univ.), Norifumi Muraki (ExCELLS, NINS) Yasuteru Shigeta (Univ. of Tsukuba.), Tadayuki Ogawa (The Univ. of Tokyo)		
Various metallic elements are involved in fundamental processes for maintaining cellular homeostasis. In this workshop, to shed light on the role of "biometals", researchers in this field are going to present their recent findings. Biological phenomenon accomplished with biometals will be comprehensively discussed from molecular to whole-body levels.		

WS3	June 17 (Thu) 9:45-12:15 (tentative)	<Session Language: Japanese/English>
Oral presentations will NOT be chosen from the free papers		
APPA/PSSJ Joint Workshop Toward International Cooperation in Protein Science		
Organizers: Msafumi Yohda (Tokyo Univ. of Agri. and Tech.), James R. Ketudat Cairns (Suranaree Univ. of Tech.)		
Speakers: Richard J. Simpson (La Trobe Inst. for Mol. Sci.), Zengyi Chang (Peking Univ.), Erinna Lee (La Trobe Inst. for Mol. Sci.), James R. Ketudat Cairns (Suranaree Univ. of Tech.), Raja Noor Zaliha Raja Abd. Rahman (Univ. Putra), Mohd Shukuri Mohamad Ali (Univ. Putra), Msafumi Yohda (Tokyo Univ. of Agri. and Tech.), Kurt Krause (Univ. of Otago)		
The Asia Pacific Protein Association (APPA) was established in 2004 with the aim of cooperating and developing protein research in the Asia-Pacific region, and holds symposiums every three years. It was scheduled to be held in Sapporo at the same time as 2020 WCPS in 2020, but it has been canceled due to COVID-19. This workshop will be held as a kick-off to the next APPA symposium. In addition to the presentation by the representative of APPA, a round table discussion on the future cooperation will be conducted.		

WS4	June 17 (Thu) 18:00-20:30 (tentative)	<Session Language: Japanese/English>
Several oral presentations will be chosen from the free papers		
Non-equilibrium state molecular movies: a new frontier in structural and functional studies on proteins		
Organizers: Eriko Nango (Tohoku Univ.), Tetsunari Kimura (Kobe Univ.)		
Speakers: Shigehiko Hayashi (Kyoto Univ.), Keiichi Inoue (The Univ. of Tokyo), Sam-Yong Park (Yokohama City Univ.), Takayuki Uchihashi (Nagoya Univ.)		
Shooting "molecular movies" by X-ray free electron lasers has enabled us to visualize structural changes in non-equilibrium states of proteins with high spatial and temporal resolution, which has opened a new era of structural and functional studies on proteins. In this workshop, we will discuss the latest research on protein structural dynamics.		

WS5	June 17 (Thu) 18:00-20:30 (tentative)	<Session Language: Japanese>
Oral presentations will NOT be chosen from the free papers		
Liquid-liquid phase separation of proteins -measurement, regulation, and application-		
Organizers: Kiyoto Kamagata (Tohoku Univ.), Tomoshi Kameda (AIST)		
Speakers: Ryo Kitahara (Ritsumeikan Univ.), Tomoto Ura, Kentaro Shiraki (Univ. of Tsukuba), Takuya Yoshizawa (Ritsumeikan Univ. ), Shinya Tsukiji (Nagoya Inst. of Tech.), Hiroyuki Noji (The Univ. of Tokyo), Kiyoto Kamagata (Tohoku Univ.), Tomoshi Kameda (AIST)		
Accumulated data demonstrate that various proteins utilize a liquid-liquid phase separation for regulating their function. In this workshop, invited speakers will present various approaches for understanding the liquid-liquid phase separation and showing its application.		

WS6	June 17 (Thu) 18:00-20:30 (tentative)	<Session Language: Japanese>
Oral presentations will NOT be chosen from the free papers		
Analysis, quality control and regulatory science of biopharmaceuticals and viral vectors for gene therapy		
Organizers: Susumu Uchiyama (Osaka Univ.) Akiko Ishii (NIHS)		

Speakers: Hiroko Shibata (NIHS), Satoshi Saitoh (Chugai Pharma Manufacturing Co., Ltd. ), Saki Yoneda (Osaka Univ.), Takashi Okada (The Univ. of Tokyo), Susumu Uchiyama (Osaka Univ.), Junichi Mineno (Takara Bio Inc.)

Many biopharmaceutical products, mainly antibody drugs, have been put into practical use. In recent years, different modalities utilizing protein engineering technologies such as bispecific antibodies have been developed, and it has become necessary to solve unique problems in quality control and regulation. On the other hand, gene therapy products using recombinant viruses have also appeared, and more complicated analysis and quality control are required. In this workshop, in addition to biopharmaceuticals, gene therapy products will be discussed by researchers who are leading the field, explaining the background and current situation, and issues from the aspect of protein science.

WS7	June 18 (Fri) 9:45-12:15 (tentative)	<Session Language: Japanese>
Oral presentations will NOT be chosen from the free papers		
Molecular Engines: From Biological Molecular Motors To Artificial Molecular Machines		
Organizers: Mitsunori Ikeguchi (Yokohama City Univ.), Takeshi Murata (Chiba Univ.)		
Speakers: Kazushi Kinbara (Tokyo Inst. of Tech.), Takafumi Ueno (Tokyo Inst. of Tech.), Akira Kakugo (Hokkaido Univ.), Mitsunori Ikeguchi (Yokohama City Univ.), Ken'ya Furuta (NICT)		
Proteins are called molecular machines, which precisely work like machines on the nanoscale. Recently, on the basis of understanding molecular mechanisms of biological molecular motors, designs of artificial molecular machines have been attempted. The key concept is the molecular engine, which generates mechanical motions by receiving external energy, and converts it to another form of energy. In this workshop, recent advances on molecular engines from structural and computational analyses of biological molecular engines to designs of novel artificial molecular engines will be discussed.		

WS8	June 18 (Fri) 9:45-12:15 (tentative)	<Session Language: Japanese>
Several oral presentations will be chosen from the free papers		
Synergistic development of protein science and antibody engineering		
Organizers: Terukazu Nogi (Yokohama City Univ.), Tomoya Hino (Tottori Univ.)		
Speakers: Takao Arimori (Osaka Univ.), Toshiyuki Okano (Waseda Univ.), Yukinari Kato (Tohoku Univ.), Terukazu Nogi (Yokohama City Univ.), Hiroshi Murakami (Nagoya Univ.)		
Usefulness of antibody fragments has been widely accepted in both x-ray crystallography and cryo-EM. This workshop will be focused on the development of novel functional antibodies and antibody-labeling techniques, which will contribute to the advancement of not only protein science but also life science in general.		

WS9	June 18 (Fri) 9:45-12:15 (tentative)	<Session Language: Japanese>
Several oral presentations will be chosen from the free papers		
Dynamic-Allosteric regulation molecular mechanism of multi-specific function of proteins in cell system		
Organizers: Yasushige Yonezawa (Kindai Univ.), Yuko Tsuchiya (RIKEN)		
Speakers: Takuma Shiraki (Kindai Univ.), Yuko Tsuchiya (RIKEN), Hiroko X Kondou (Kitami Inst. of Tech.), Yasushige Yonezawa (Kindai Univ.)		

Proteins regulate cell system in a very sophisticated manner. The mechanisms that realize this exquisite control have not yet been elucidated. Proteins are dynamic entities, and it is difficult to understand the diversity, specificity, and cooperativity from static view point. Here, we would like to review and discuss the experimental and theoretical studies on the dynamic and allosteric properties that exhibit diverse multi-specific functions of proteins.

WS10	June 16 (Wed) 18:00-20:30 (tentative)	<Session Language: Japanese/English>
Several oral presentations will be chosen from the free papers		
Scientific research on innovative areas "Integrated Biometal Science" (tentative)		
Organizers: Yuta Amagai (Tohoku Univ.) , Takeshi Yokoyama (Tohoku Univ.)		
Speakers: Yuta Amagai (Tohoku Univ.) , Makoto Nakakido (The Univ. of Tokyo), Chai Gopalasingam (Hyogo Pref. Univ.), Yukina Nishito (Kyoto Pharm. Univ.) Yoshiaki Furukawa (Keio Univ.), Norifumi Muraki (ExCELLS, NINS) Yasuteru Shigeta (Univ. of Tsukuba.), Tadayuki Ogawa (The Univ. of Tokyo)		
Various metallic elements are involved in fundamental processes for maintaining cellular homeostasis. In this workshop, to shed light on the role of "biometals", researchers in this field are going to present their recent findings. Biological phenomenon accomplished with biometals will be comprehensively discussed from molecular to whole-body levels.		

WS11	June 18 (Fri) 17:30-20:00 (tentative)	<Session Language: Japanese>
Oral presentations will NOT be chosen from the free papers		
Artificial design of biomolecules on bioscience research		
Organizers: Koki Makabe (Yamagata Univ.), Shun-ichi Tanaka (Kyoto Pref. Univ.)		
Speakers: Koki Makabe (Yamagata Univ.), Norihisa Yasui (Okayama Univ.) Munenori Numata (Kyoto Pref. Univ.), Ryoichi Arai (Shinshu Univ.), Yukiko Kamiya (Nagoya Univ.), Miki Imanishi (Kyoto Univ.), Shun-ichi Tanaka (Kyoto Pref.)		
Recent years, the use of the artificially modified and/or designed biomolecules for biological research and therapeutic applications are advancing. In this workshop, we will discuss the role of these molecules and future directions on bioscience field via the introduction of state-of-the-art design of proteins, peptides, nucleic acids, and sugar molecules.		

WS12	June 18 (Fri) 17:30-20:00 (tentative)	<Session Language: Japanese>
Oral presentations will NOT be chosen from the free papers		
Customizing image processing steps for difficult cases of cryo-EM structure determination of proteins		
Organizers: Toshio Moriya (KEK), Takeshi Yokoyama (Tohoku Univ.)		
Speakers: Toshio Moriya (KEK), Takeshi Yokoyama (Tohoku Univ.), Yukihiko Sugita (Kyoto Univ.), Tsutsumi Akihisa (The Univ. of Tokyo), Naoyuki Miyazaki (Univ. of Tsukuba), Koji Kato (Okayama Univ.)		
To determine the structure of "difficult protein" with near-atomic resolution using cryo-EM single particle analysis, the image processing workflow is not straightforward. Here, we will present details of SPA workflows by focusing on specific examples of difficult cases, such as unknown structure, special shape without symmetry, and large structural change.		