

# International Symposium on Exponential Biomedical DX 2024 (eMEDX-24)

**Dec.19<sup>th</sup>-20<sup>th</sup> 2024 Ishikawa, Japan**

**Venue & Facilities : Ishikawa High-Tech Conference Center**

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## Symposium Schedule: December 19<sup>th</sup>

	Room A	Room B	Room C	Room D	Kanazawa Kokusai Hotel
11:00					
12:00	Registration				
13:00	Opening ceremony				
14:00	1AP01				
15:00	Coffee break				
16:00	1AK01	1BK01	1CK01		
17:00	1AK02	1BK02			
18:00	1AI01	1BI01	1CI01	1DI01	
19:00	Break				
20:00	1AI02	1BI02	1CI02	JAIST-SPRING SCHOLARSHIP RESEARCH FELLOW SESSION	
21:00	1AI03	1BI03	1CI03		
22:00					Banquet

- Plenary Lecture: 45 min
- Keynote Lecture: 30 min
- Invited Lecture: 20 min

(Including discussion time)

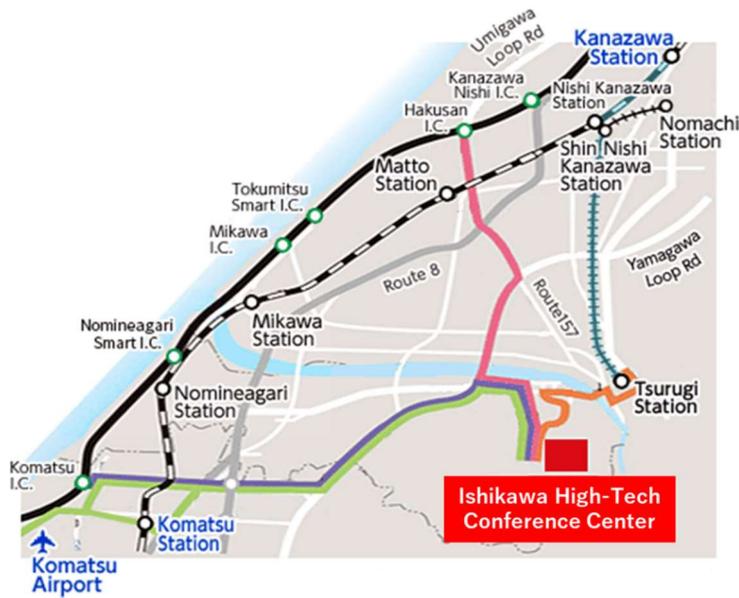
## Symposium Schedule: December 20<sup>th</sup>

	Room A	Room B	Room C	Room D
8:00				Poster set-up
9:00	2AP01			
10:00	2AP02			..... Poster session
	Coffee break			
11:00	2AK01	2BK01	2CK01	
	2AK02	2BI01	2CI01	
12:00	2AI01	2BI02	2CI02	
		2BI03	2CI03	
13:00	Lunch			
	2AK03	2BI04	2CI04	
14:00	2AI02	2BI05	2CI05	
	2AI03	2BI06	2CI07	
15:00	Coffee break			
	2AI04	2BI07	2CI08	
	2AI05	2BI08	2CI09	
16:00	2AI06	2BI09	Poster removal	
	Closing ceremony			
17:00				

- Plenary Lecture: 45 min
- Keynote Lecture: 30 min
- Invited Lecture: 20 min

(Including discussion time)

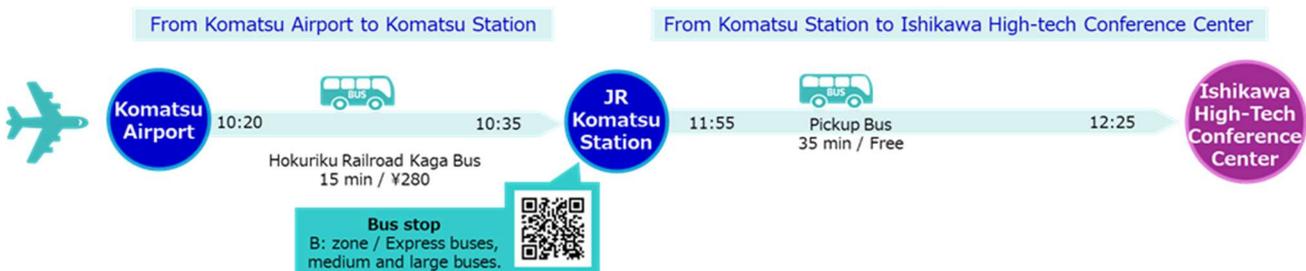
## Location and Access



### December 19<sup>th</sup>

#### ● From Komatsu Station to Ishikawa High-Tech Conference Center

On December 19<sup>th</sup>, a free large bus arranged by eMEDX-24 is available from Komatsu Station to the Ishikawa High-Tech Conference Center (Komatsu Station 11:55 → Ishikawa High-Tech Conference Center: 12:25, operated by Kanazawa Oriental Bus). The bus departs from the B: Zone bus stop, just a 2-minute walk from Komatsu Station. Please let the bus driver know that you are an eMEDX-24 participant, and you will be allowed to board promptly. To get from Komatsu Airport to Komatsu Station, please use public transportation (e.g., Komatsu Airport 10:20 → Komatsu Station 10:35, operated by Hokuriku Railroad Kaga Bus).



## JR Komatsu Station

Bus stop **B: zone**



### ● From Kanazawa Station to Ishikawa High-Tech Conference Center

From Kanazawa Station, take the IR Ishikawa Line and get off at Nishi-Kanazawa Station (e.g., Kanazawa Station 10:30 → Nishi-Kanazawa Station 10:33, operated by IR Ishikawa Line). Then, walk (about 3 minutes) to Shin-Nishikanazawa Station. Board the Hokutetsu Ishikawa Line and get off at Tsurugi Station (e.g., Shin-Nishikanazawa Station 10:53 → Tsurugi Station 11:20, operated by Hokuriku Railroad). From the left side of the station, take the bus from the bus stop to board the "JAIST Shuttle (e.g., Tsurugi Station 11:22 → High-Tech Mae 11:32). Please let the bus driver know that you are an eMEDX-24 participant, and you will be allowed to board promptly. When you approach "High-tech Mae", please press the stop button. You can also inform the bus driver when you board that you want to get off at "High-tech Mae". Get off at "High-tech Mae" and walk for 1 minute to the Ishikawa High-Tech Conference Center. Please be careful when crossing the road, as there is no pedestrian crossing, and watch for oncoming traffic.

#### From Kanazawa Station to Ishikawa High-tech Conference Center

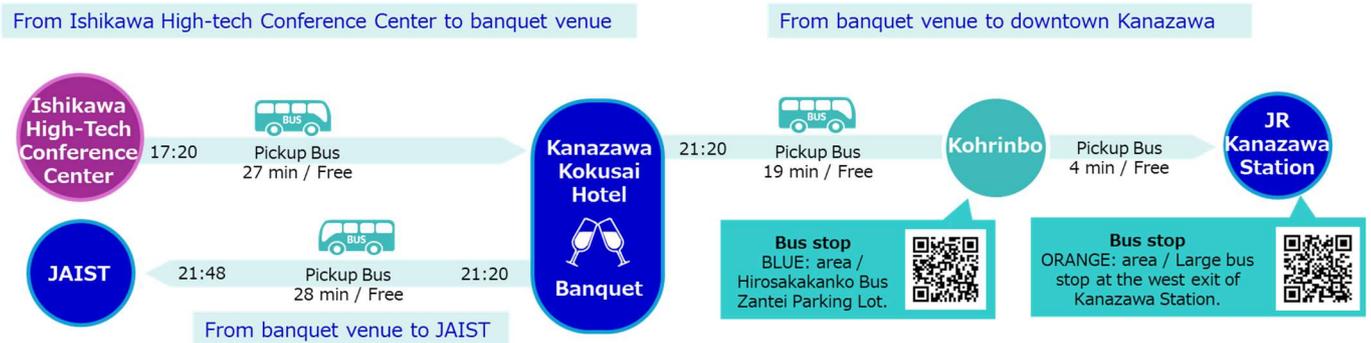


### ● From Ishikawa High-Tech Conference Center to the Banquet Venue (Kanazawa Kokusai Hotel)

A free large bus arranged by eMEDX-24 will operate between the Ishikawa High-Tech Conference Center and the Kanazawa Kokusai Hotel (Ishikawa High-Tech Conference Center 17:20 → Kanazawa Kokusai Hotel 17:47, operated by Kanazawa Kokusai Hotel). The bus will depart from the parking area at the Ishikawa High-Tech Conference Center.

● **From the Banquet Venue (Kanazawa Kokusai Hotel) to Kanazawa Station and Ishikawa High-Tech Conference Center**

After the banquet, free buses will be available to Kanazawa Station via downtown Kanazawa (Kohrinbo) and to the Ishikawa High-Tech Conference Center. Please note that the buses to Kanazawa Station and the ones to the Ishikawa High-Tech Conference Center are different. Be sure to double-check your destination to avoid any confusion.



**December 20<sup>th</sup>**

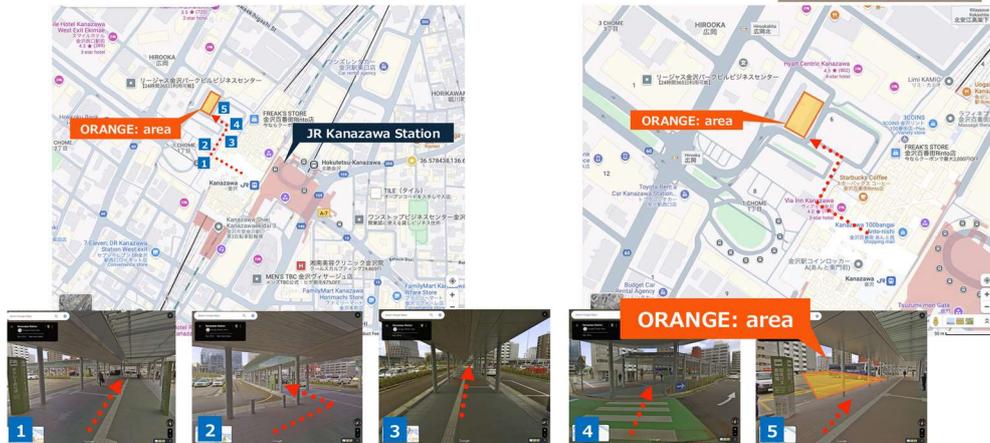
● **From Kanazawa Station to Ishikawa High-Tech Conference Center**

On December 20<sup>th</sup>, a free large bus arranged by eMEDX-24 is available from Kanazawa Station to the Ishikawa High-Tech Conference Center (Kanazawa Station 7:30 → Kohrinbo 7:45 → Ishikawa High-Tech Conference Center 8:30, operated by Kanazawa Oriental Bus). The bus departs from the Tourist Bus Stop, just a 3-minute walk from Kanazawa Station West Exit (See orange area). Please let the bus driver know that you are an eMEDX-24 participant, and you will be allowed to board promptly.



## JR Kanazawa Station

Bus stop **ORANGE :area**



## Kohrinbo

Bus stop **BLUE: area**



- **From Kanazawa Kokusai Hotel to Ishikawa High-Tech Conference Center**

A free large bus arranged by eMEDX-24 is available from Kanazawa Kokusai Hotel to the Ishikawa High-Tech Conference Center (Kanazawa Kokusai Hotel 8:15 → Ishikawa High-Tech Conference Center 8:40, operated by Kanazawa Kokusai Hotel). The bus will depart from the parking area at the Kanazawa Kokusai Hotel. Please let the bus driver know that you are an eMEDX-24 participant, and you will be allowed to board promptly.

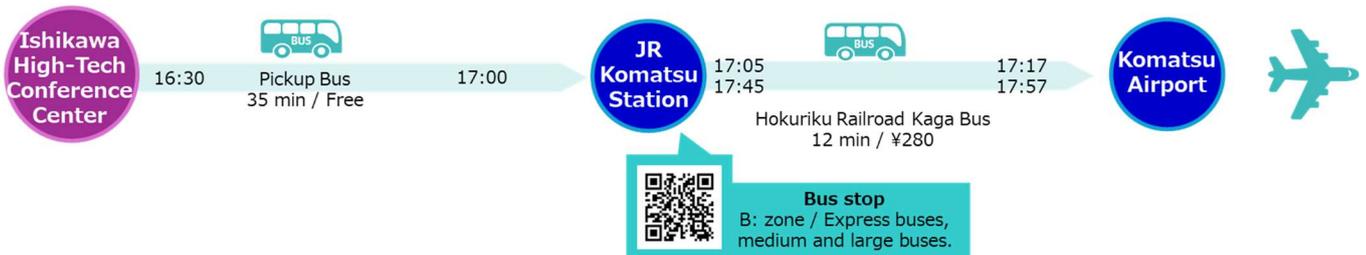
- **From Ishikawa High-Tech Conference Center to Komatsu Station**

A free large bus arranged by eMEDX-24 is available from the Ishikawa High-Tech Conference Center to Komatsu Station (Ishikawa High-Tech Conference Center 16:30 → Komatsu Station 17:00, operated by

Kanazawa Oriental Bus). The bus will depart from the parking area at the Ishikawa High-Tech Conference Center and will arrive at the B: Zone bus stop, just a 2-minute walk from Komatsu Station. To travel from Komatsu Station to Komatsu Airport, please use public transportation (e.g., Komatsu Station 17:45 → Komatsu Airport 17:57, operated by Hokuriku Railroad Kaga Bus).

From Ishikawa High-tech Conference Center to Komatsu Station

From Komatsu Station to Komatsu Airport



● From Ishikawa High-Tech Conference Center to Kanazawa Station

Please board the "JAIST Shuttle" at "High-Tech Mae" (e.g., High-Tech Mae 16:55 → Tsurugi Station 17:08). When boarding, inform the bus driver that you are an eMEDX-24 participant, and you will be allowed to board promptly. Get off at the final stop, Tsurugi Station. Then, take the Hokutetsu Ishikawa Line and get off at Shin-Nishikanazawa Station (e.g., Tsurugi Station 17:28 → Shin-Nishikanazawa Station 17:56, operated by Hokuriku Railroad). From there, walk (about 3 minutes) to Shin-Nishikanazawa Station, board the IR Ishikawa Line, and get off at Kanazawa Station (e.g., Shin-Nishikanazawa Station 18:12 → Kanazawa Station 18:17, operated by IR Ishikawa Line).

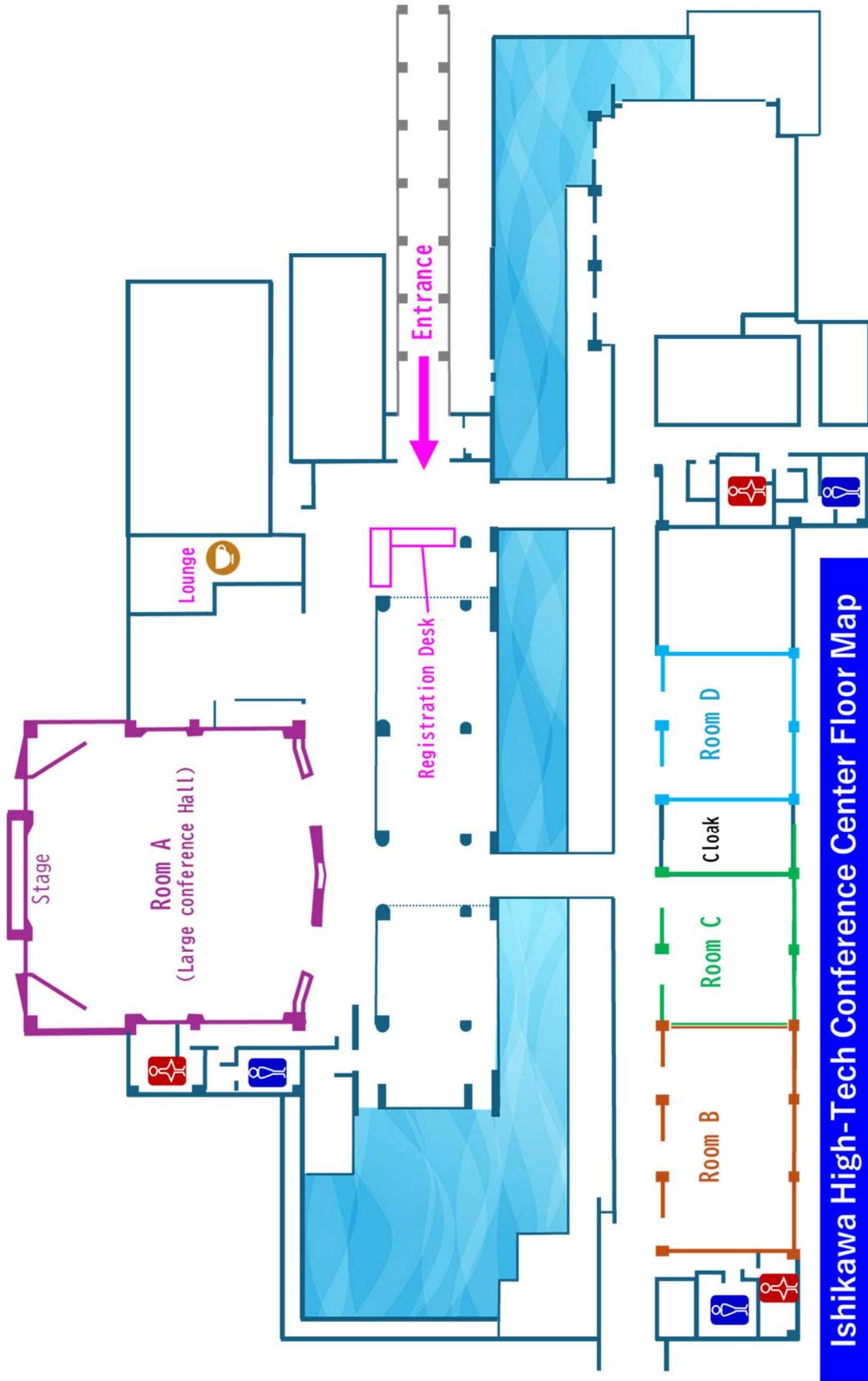
From Ishikawa High-tech Conference Center to Kanazawa Station



For detailed access information, please visit the official eMEDX-24 website. If you have any questions, feel free to contact the secretariat of eMEDX-24.



*Floor Layout of Ishikawa High-Tech Conference Center*



**Ishikawa High-Tech Conference Center Floor Map**

## *Welcome Message*



Dear Esteemed Colleagues,

It is with great pleasure that we welcome you to the inaugural International Symposium on Exponential Biomedical DX 2024 (eMEDX-24), held from December 19 to 20, 2024, in Ishikawa, Japan. This symposium focuses on the exciting intersection of biomaterials and digital transformation (DX) integration, reflecting the critical advancements shaping the future of biomedical science and technology.

eMEDX-24 brings together leading scientists and researchers from academia and industry worldwide, all at the forefront of innovation in these fields. Our discussions will explore a diverse array of topics, with a shared commitment to advancing well-being through groundbreaking research, interdisciplinary collaboration, and transformative applications.

We are honored to host distinguished plenary speakers, including:

- \* Emeritus Professor Teruo Okano, Tokyo Women's Medical University
- \* Emeritus Professor Kazunari Akiyoshi, Kyoto University
- \* Professor Ki Dong Park, Ajou University
- \* Principal Research Scientist Kwang-Ryeol Lee, Korea Institute of Science and Technology

Their expertise and insights will undoubtedly inspire us to push the boundaries of biomaterials research and DX integration.

We extend our heartfelt gratitude to all participants for contributing to the success of this symposium. Your dedication, innovation, and collaboration are vital to our shared mission. Together, we aim to unlock new possibilities for biomedical science and technology, fostering solutions that will profoundly impact health and society.

Thank you for joining us in this endeavor to shape the future of biomedical science and technology.

Professor Kazuaki Matsumura

Chair, eMEDX-24

Director, Research Center for Exponential Biomedical DX

Japan Advanced Institute of Science and Technology

## *General Information*

### ■ About Conference

Date: 19<sup>th</sup> to 20<sup>th</sup> December 2024

Venue: Ishikawa High-Tech Conference Center, Ishikawa, Japan

### ■ Registration Desk

Please all participants check in at the registration desk and obtain the conference bag.

19<sup>th</sup>: 11:30-13:00, Ishikawa High-Tech Conference Center

20<sup>th</sup>: 8:00-9:00, Ishikawa High-Tech Conference Center

### ■ Lunch and Coffee Break

Drinks will be provided on the tables. Please feel free to help yourself. Additionally, light refreshments will be available during lunch. You are welcome to enjoy these as well.

### ■ Internet Access

Wi-Fi is available free of charge at the Ishikawa High-Tech Conference Center.

### ■ How to Download Abstract Book

The abstract book can be downloaded from the following URL.

URL: <https://www.jaist.ac.jp/ricenter/emedx/emedx-24/>

## *Social Events*

### ■ Symposium Banquet (December 19<sup>th</sup>)

The symposium banquet will be held from 19:00 to 21:00 at Kanazawa Kokusai Hotel, which is a 27-minute bus ride from the symposium venue. The banquet will be a seated event. All those who wish to attend should register in advance.

## *Notice for Presenters*

■ **Oral Presentations:** The time allocated for plenary, keynote, and invited presentations will be 45, 30, and 20 minutes, respectively, including time for discussion. Presenters are required to bring their own laptops. The connection to the projector is via HDMI, so please ensure you have any necessary adapters for converting between HDMI and other connection ports. We kindly ask that speakers prepare their presentations during the preceding lecture, as the allocated time does not include transition periods.

■ **Poster Presentations:** Participants giving poster presentations should be present during the assigned times to discuss their findings. Materials for attaching posters to the boards (pins or adhesive tapes) will be provided at the conference site. The size of the poster board is 900 mm (width) x 1800 mm (height). We recommend using A0 paper (841 mm width x 1189 mm height) for poster presentations. Posters can be set up from 8:00 a.m. on the 20<sup>th</sup> in Room D. The poster presentations will be held from 12:30 p.m. to 1:30 p.m. on the 20<sup>th</sup>. The obligation time is divided into the first half (12:30-1:00) for the posters of odd numbers and the second half (1:00-1:30) for the even numbers. Please remove your poster promptly after the poster session, which ends at 1:30 p.m.

Best Poster Award will be granted based on the merits of the presentation abstract and the overall impact of the presentation. The award ceremony will take place in Room A during the closing ceremony, starting at 16:00.

Four awards will be presented, named after renowned scientists:

- \* Teruo Okano Award
- \* Ki Dong Park Award
- \* Kazunari Akiyoshi Award
- \* Kwang-Ryeol Lee Award

### Oral Session Timetable: December 19<sup>th</sup>

Ishikawa High-Tech Conference Center											
Room A			Room B			Room C			Room D		
Time	No.	Speaker	Time	No.	Speaker	Time	No.	Speaker	Time	No.	Speaker
Registration											
11:30-13:00											
13:00-13:15		<b>Opening ceremony</b>									
13:15-14:00	<b>1AP01</b>	T. Okano									
14:00-14:45	<b>1AP02</b>	K. D. Park									
14:45-15:05			<b>Coffee break</b>								
15:05-15:35	<b>1AK01</b>	T. Shimizu	15:05-15:35	<b>1BK01</b>	D. Bhatia	15:05-15:35	<b>1CK01</b>	S. Deguchi			
15:35-15:55	<b>1AI01</b>	K. H. Chan	15:35-15:55	<b>1BI01</b>	K. Kuroda	15:35-15:55	<b>1CI01</b>	T. Taguchi	15:35-15:55	<b>1DI01</b>	H. Miyajima
15:55-16:05			<b>Break</b>								
16:05-16:25	<b>1AI02</b>	S. Arai	16:05-16:25	<b>1BI02</b>	C. Yoshikawa	16:05-16:25	<b>1CI02</b>	M. Matsusaki	15:55-16:45	<b>SCHOLARSHIP RESEARCH FELLOW SESSION</b>	
16:25-16:45	<b>1AI03</b>	J. Kobayashi	16:25-16:45	<b>1BI03</b>	T. Nakaji	16:25-16:45	<b>1CI03</b>	N. Kamiya			
16:45-17:15	<b>1AK02</b>	T. Ooya	16:45-17:15	<b>1BK02</b>	G. Chen						

## Symposium Timetable: December 20<sup>th</sup>

Ishikawa High-Tech Conference Center													
Room A			Room B			Room C			Room D				
Time	No.	Speaker	Time	No.	Speaker	Time	No.	Speaker	Time	No.	Speaker		
8:00-9:00			Registration									8:00-9:00	Poster set-up
9:00-9:45	<b>2AP01</b>	K. Akiyoshi											
9:45-10:30	<b>2AP02</b>	K.-R. Lee											
10:30-10:50			<b>Coffee break</b>										
10:50-11:20	<b>2AK01</b>	K. M. Huh	10:50-11:20	<b>2BK01</b>	K. Tsuda	10:50-11:20	<b>2CK01</b>	P. Opaprakasi					
11:20-11:50	<b>2AK02</b>	Y. Ohya	11:20-11:40	<b>2BI01</b>	K. Makabe	11:20-11:40	<b>2CI01</b>	N. Morimoto					
			11:40-12:00	<b>2BI02</b>	M. Shimabukuro	11:40-12:00	<b>2CI02</b>	T. Murakami					
11:50-12:10	<b>2AI01</b>	K. Nagase	12:00-12:20	<b>2BI03</b>	Y. Kanematsu	12:00-12:20	<b>2CI03</b>	S. Fujii					
12:20-13:30			<b>Lunch</b>									12:30-13:30	<b>Poster session</b>
13:30-14:00	<b>2AK03</b>	R. Yoshida	13:30-13:50	<b>2BI04</b>	Y. Arima	13:30-13:50	<b>2CI04</b>	K. Sakamoto					
14:00-14:20	<b>2AI02</b>	E. Yuba	13:50-14:10	<b>2BI05</b>	N. Tanaka	13:50-14:10	<b>2CI05</b>	T. Niidome					
14:20-14:40	<b>2AI03</b>	C. Hosokawa	14:10-14:30	<b>2BI06</b>	S. Fujita	14:10-14:30	<b>2CI07</b>	S. Y. Park					
14:40-15:00			<b>Coffee break</b>										
15:00-15:20	<b>2AI04</b>	T. Sawa	15:00-15:20	<b>2BI07</b>	K. Sakakibara	15:00-15:20	<b>2CI08</b>	N. Yongvongsoontorn					
15:20-15:40	<b>2AI05</b>	Y. Higuchi	15:20-15:40	<b>2BI08</b>	T. Yamaguchi	15:20-15:40	<b>2CI09</b>	Y. Arais					
15:40-16:00	<b>2AI06</b>	K. Okeyoshi	15:40-16:00	<b>2BI09</b>	K. Nishida								
16:00-16:20	<b>Closing ceremony</b>												

## *Oral Program*

**Thursday December 19<sup>th</sup>, 2024**

***Room A***

13:00-13:15      Opening Ceremony

*Chair: Motoichi Kurisawa*

13:15-14:00      **1AP01** Teruo Okano (Tokyo Women's Medical University, Cell Sheet Tissue Engineering Center)

Temperature responsive polymeric materials for cell sheet regenerative therapy

14:00-14:45      **1AP02** Ki Dong Park (Ajou University)

Therapeutic platform based on bioactive hydrogels

Coffee Break

*Chair: Tooru Ooya*

15:05-15:35      **1AK01** Tatsuya Shimizu (Tokyo Women's Medical University)

Diversity of tissue engineering ---From medical treatment to food production---

15:35-15:55      **1AI01** Kiat Hwa Chan (National University of Singapore)

A study of the co-assembling potential of short amphiphilic peptides

Break

*Chair: Kiat Hwa Chan*

16:05-16:25      **1AI02** Satoshi Arai (Kanazawa University)

Nanothermometry and nanoheating platforms for thermal cell engineering

16:25-16:45      **1AI03** Jun Kobayashi, Teruo Okano (Tokyo Women's Medical University)

Creation and transplantation of angiogenic factor-secreting hepatocyte sheets by gene delivery

16:45-17:15      **1AK02** Tooru Ooya (Kobe University)

Design of Nanoparticles for Cancer Therapy

## *Oral Program*

**Thursday December 19<sup>th</sup>, 2024**

***Room B***

*Chair: Chiaki Yoshikawa*

- 15:05-15:35 **1BK01** Dhiraj Bhatia (Indian Institute of Technology Gandhinagar)  
(Online) DNA based nanosystems for programming biological systems and applications
- 15:35-15:55 **1BI01** Kosuke Kuroda (Kanazawa University)  
Next-generation solvents in the life sciences

Break

*Chair: Kosuke Kuroda*

- 16:05-16:25 **1BI02** Chiaki Yoshikawa, Hiroshi Mamitsuka (National Institute for Materials Science)  
Machine learning to predict multicellular dynamics driven by concentrated polymer brush-modified cellulose nanofibers
- 16:25-16:45 **1BI03** Tadashi Nakaji-Hirabayashi, Moe Kato, Ryoma Takagi (Toyama University)  
Bio-active and bio-inactive material using protein- and peptide- anchoring technique
- 16:45-17:15 **1BK02** Guoping Chen (National Institute for Materials Science, University of Tsukuba)  
Design and fabrication of multi-functional scaffolds for biomedical applications

## *Oral Program*

**Thursday December 19<sup>th</sup>, 2024**

***Room C***

*Chair: Michiya Matsusaki*

15:05-15:35 **1CK01 Shigeru Deguchi** (Japan Agency for Marine-Earth Science and Technology)  
Deep-sea-inspired materials chemistry

15:35-15:55 **1CI01 Tetsushi Taguchi** (National Institute for Materials Science)  
Development of tissue adhesive materials based on fish-derived gelatin for biomedical applications

Break

*Chair: Eijiro Miyako*

16:05-16:25 **1CI02 Michiya Matsusaki** (Osaka University)  
Engineering vascular networks in 3D-tissue constructs for biomedical and food applications

16:25-16:45 **1CI03 Noriho Kamiya** (Kyushu University)  
Exploring the potential of transglutaminase-mediated bioconjugation in biomedical applications

## *Oral Program*

**Thursday December 19<sup>th</sup>, 2024**

***Room D***

*Chair: Kazuaki Matsumura*

15:35-15:55 **1DI01 Hiroki Miyajima,<sup>1</sup> C. Handa,<sup>2</sup> N. B. Hikuma,<sup>2</sup> S. Oishi,<sup>2</sup> Y. Hatta,<sup>2</sup> K. Kojima,<sup>2</sup> M. Mukai,<sup>2</sup> S. Maruo,<sup>2</sup> K. Iijima<sup>2</sup> (<sup>1</sup>Fukui University, <sup>2</sup>Yokohama National University)**

Design, photo-fabrication and characterization of photo decomposable gelatin-based hydrogel cell scaffolds

*Mentor: Kenta Hongo*

15:55-16:45 **JAIST-SPRING SCHOLARSHIP RESEARCH FELLOW SESSION**

“Purpose of Ph.D.”

“Career plans after Ph.D.”

We would like to have a discussion among students about the purpose of obtaining a doctorate and career plans afterwards. On the day, Dr. Hiroki Miyajima of University of Fukui will talk about “The Purpose of Doctoral Degree and Career Plan after Doctoral Degree”. This is a good opportunity to rethink about your future student life and after graduation.

At this meeting, we would like to have a relaxed discussion over light refreshments and for everyone to interact with each other. Everyone is welcome to attend.

## *Oral Program*

**Friday December 20<sup>th</sup>, 2024**

***Room A***

*Chair: Kazuaki Matsumura*

9:00-9:45     **2AP01** Kazunari Akiyoshi (Kyoto University)  
Development of bio-inspired nanomaterials for DDS

*Chair: Kenta Hongo*

9:45-10:30     **2AP02** Kwang-Ryeol Lee (Korea Institute of Science and Technology)  
Standardization of materials R&D data schema and vocabulary

Coffee Break

*Chair: Kazuaki Matsumura*

10:50-11:20     **2AK01** Kang Moo Huh (Chungnam National University)  
Glycol chitosan-based thermogelling biomaterials for biomedical applications

11:20-11:50     **2AK02** Yuichi Ohya,<sup>1</sup> Takuma Kato,<sup>1</sup> Kenta Horii,<sup>1</sup> Nobuo Murase,<sup>1</sup> Yuta Yoshizaki<sup>2</sup>  
(<sup>1</sup>Kansai University, <sup>2</sup>Tohoku University)  
Application of hyaluronic acid-coated polymeric micelles as an intranasal vaccine against coronavirus infection

11:50-12:10     **2AI01** Kenichi Nagase (Hiroshima University)  
Temperature-modulated bioseparation of next-generation medicines using functional polymers

Lunch

*Chair: Kosuke Okeyoshi*

13:30-14:00     **2AK03** Ryo Yoshida (The University of Tokyo)  
Life-like “self-oscillating” polymer gels exhibiting autonomous behaviors

14:00-14:20     **2AI02** Eiji Yuba (Osaka Metropolitan University)  
Design of pH-sensitive polymer-based antigen carriers for immunoengineering

14:20-14:40     **2AI03** Chie Hosokawa (Osaka Metropolitan University)  
Laser manipulation of cultured hippocampal neurons

Coffee Break

*Chair: Eiji Yuba*

- 15:00-15:20    **2AI04 Tomohiro Sawa** (Kumamoto University)  
Supersulfides as multipotent regulators of innate immune responses
- 15:20-15:40    **2AI05 Yuriko Higuchi** (Kyoto University)  
Cell surface engineering for targeted delivery of therapeutic cells
- 15:40-16:00    **2AI06 Kosuke Okeyoshi** (Japan Advanced Institute of Science and Technology)  
Bioinspired sol-gel designs using phase transition of water
- 16:00-16:20    Closing ceremony

## *Oral Program*

**Friday December 20<sup>th</sup>, 2024**

**Room B**

*Chair: Kenta Hongo*

10:50-11:20 **2BK01** Koji Tsuda (The University of Tokyo)

De novo molecule generators: current status and new directions

11:20-11:40 **2BI01** Koki Makabe (Yamagata University)

Construction of amyloid mimetic proteins to investigate the dye binding and catalytic properties

11:40-12:00 **2BI02** Masaya Shimabukuro, Masakazu Kawashita (Institute of Science Tokyo)

Balancing antibacterial and osteogenic activities in biomaterials for anti-infective bone reconstruction

12:00-12:20 **2BI03** Yusuke Kanematsu,<sup>1</sup> Yu Takano<sup>2</sup> (<sup>1</sup>Hiroshima University, <sup>2</sup>Hiroshima City University)

Development of Web Applications for the Statistical Analysis of the Structure-Function Relationship among Metalloproteins

Lunch

*Chair: Takumi Yamaguchi*

13:30-13:50 **2BI04** Yusuke Arima, Shi Ting Lee, Kaoru Tamada (Kyushu University)

Live-cell imaging with high axial resolution using self-assembled gold nanoparticle metasurfaces

13:50-14:10 **2BI05** Nobuyuki Tanaka (Institute of Physical and Chemical Research)

Digital co-creation for biosystems and dynamics data

14:10-14:30 **2BI06** Satoshi Fujita, Zhuohan Xin, Keiko Deguchi, Masashi K. Kajita, Shin-ichiro Suye (Fukui University)

Time-series clustering of single cell trajectories in collective cell migration

Coffee Break

*Chair: Satoshi Fujita*

15:00-15:20 **2BI07** Keita Sakakibara (National Institute of Advanced Industrial Science & Technology)

Revealing the potential of nanocellulose: Unique characteristics from diverse raw materials and DX-assisted applications

15:20-15:40 **2BI08** Takumi Yamaguchi (Japan Advanced Institute of Science and Technology, Nagoya City University, Exploratory Research Center on Life and Living Systems)

Glycoengineering for the application of the biological functions of carbohydrates

15:40-16:00

**2BI09** Kei Nishida, Masayasu Mie, Eiry Kobatake (Institute of Science Tokyo)

Multifunctional protein-based micropatch capable of adhering to intestinal tissue with high efficiency

## *Oral Program*

**Friday December 20<sup>th</sup>, 2024**

***Room C***

*Chair: Ejiro Miyako*

10:50-11:20 **2CK01** Pakorn Opaprakasit,<sup>1</sup> Oceu Dwi Putri,<sup>1,2</sup> Kamonchanok Thananukul,<sup>1</sup> Chariya Kaewsaneha,<sup>1</sup> Atitsa Petchsuk,<sup>3</sup> Mantana Opaprakasit,<sup>4</sup> Kazuaki Matsumura<sup>2</sup> (<sup>1</sup>Thammasat University, <sup>2</sup>Japan Advanced Institute of Science and Technology, <sup>3</sup>National Metal and Materials Technology Center, <sup>4</sup>Chulalongkorn University)

Functional polymeric nanoparticles and microneedles for controlled release applications

11:20-11:40 **2CI01** Nobuyuki Morimoto (Shimane University)

Sulfobetaine polymers for functional biomaterials

11:40-12:00 **2CI02** Tatsuya Murakami (Toyama Prefectural University, Kyoto University)

Drug delivery system for photodynamic therapy of eye diseases with engineered lipoprotein

12:00-12:20 **2CI03** Syuji Fujii (Osaka Institute of Technology)

Polyhedral liquid marble

Lunch

*Chair: Nunnarpas Yongvongsoontorn*

13:30-13:50 **2CI04** Kotaro Sakamoto (Ichimaru Pharcos Company Limited)

Drug discovery frontier: Macrocyclic peptides KS-133 and KS-487 for Central nervous system diseases

13:50-14:10 **2CI05** Takuro Niidome, Masayasu Mie, Eiry Kobatake (Kumamoto University)

Biodegradable polymer-coated cardiovascular Mg stent

*Chair: Ejiro Miyako*

14:10-14:30 **2CI07** Sung Young Park (Korea National University of Transportation)

Tumor microenvironment-responsive viscoelasticity and electronic signaling of self-reporting conductive hydrogel

Coffee Break

*Chair: Ejiro Miyako*

15:00-15:20 **2CI08** Nunnarpas Yongvongsoontorn, Joo Eun Chung, Motoichi Kurisawa (Japan Advanced Institute of Science and Technology)

Carrier-enhanced efficacy of molecular targeted drug-loaded nanoparticles for cancer therapy

15:20-15:40

**2CI09** Shintaro Kita, Moka Uetani, Shiho Kawai, Noriyuki Koderu, Yuhei Araisu  
(Kanazawa University)

Structure and dynamics of molecular machineries regulating mitochondrial fission and fusion

## *Poster Program*

**Friday December 20<sup>th</sup>, 2024**

### **Room D**

- 2P01** S. Chintalapati, S. Iwata, M. Miyahara, E. Miyako (Japan Advanced Institute of Science and Technology)  
Tumor-isolated Cutibacterium acnes as an effective tumor-suppressive living drug
- 2P02** Y. Qi, M. Miyahara, S. Iwata, E. Miyako (Japan Advanced Institute of Science and Technology)  
Light-activatable liquid metal immunostimulants for cancer nanotheranostics
- 2P03** S. H. Subba, S. Y. Park (Korea National University of Transportation)  
Cancer microenvironment-specific electrical and fluorescence changes of pH-responsive polymer dot-coated sensor
- 2P04** T. M. Kim, S. Y. Park (Korea National University of Transportation)  
pH-responsive conductive hydrogel with a strain-pressure touch sensor for tumor microenvironment diagnosis
- 2P05** S. Aoki,<sup>1</sup> M. Shimabukuro,<sup>1</sup> R. Kishida,<sup>2</sup> T. Yokoi,<sup>1</sup> M. Kawashita<sup>1</sup> (<sup>1</sup>Institute of Science Tokyo, <sup>2</sup>Kyushu University)  
Influence of Applied Voltage on Bacterial Growth on Porous Tantalum Oxide Surfaces Formed by Micro-Arc Oxidation
- 2P06** R. Miyake, M. Shimabukuro, E. Marukawa, M. Kawashita (Institute of Science Tokyo)  
Enhancing Osteogenesis on Titanium Surface via Biodegradable Magnesium-based Coating
- 2P07** H. Pitakjakkpipop,<sup>1</sup> K. Matsumura,<sup>2</sup> P. Opaprakasit,<sup>3</sup> P. Khanchaitit<sup>1</sup> (<sup>1</sup>National Science and Technology Development Agency (NSTDA), <sup>2</sup>Japan Advanced Institute of Science and Technology, <sup>3</sup>Thammasat University)  
Microneedle Technology: A Novel Tool for Transdermal Applications
- 2P08** Thi Kim Loc Nguyen, Nobuaki Ito, Kosuke Okeyoshi (Japan Advanced Institute of Science and Technology)  
Anisotropic pH-Responsive Chitosan Hydrogels Prepared by Meniscus Splitting Method
- 2P09** R. Hagiwara, K. Okeyoshi (Japan Advanced Institute of Science and Technology)  
Design of Open Systems Using Aqueous Polymer Solutions Causing Meniscus Splitting
- 2P10** T. Yamamoto,<sup>1</sup> R. Hagiwara,<sup>1</sup> S. Nishimura,<sup>1</sup> R. Yoshida,<sup>2</sup> K. Okeyoshi<sup>1</sup> (<sup>1</sup>Japan Advanced Institute of Science and Technology, <sup>2</sup>The University of Tokyo)  
Bioinspired design of copolymer-conjugated nanocatalysts for photoinduced active electron transfer
- 2P11** M. Ninomiya, Y. Watanabe, K. Okeyoshi (Japan Advanced Institute of Science and Technology)  
Formation of Periodic Open-Close Structures as Drying Records of Polymer Dispersion
- 2P12** S. Ito, K. Hongo (Japan Advanced Institute of Science and Technology)  
Machine learning models for predicting pharmacological activity and drug discovery indicators of DPP-4 inhibitors

- 2P13** S.E. Kim,<sup>1</sup> E.J. Lee,<sup>2</sup> Y.J. Lee,<sup>1</sup> H.S. Shin,<sup>2</sup> K.M. Huh<sup>1</sup> (<sup>1</sup>Chungnam National University, <sup>2</sup>Hanyang University)  
Novel Injectable and Dual-crosslinkable Biohybrid Thermogel Scaffold with Adjustable Physical Properties and Enhanced Cell Adhesion
- 2P14** S.Y. Shin,<sup>1</sup> S. Kim,<sup>1</sup> R.E. Kim,<sup>2</sup> E.Y. Kim,<sup>2</sup> S.Y. Park,<sup>2</sup> P.H. Minh,<sup>1</sup> W.K. Cho,<sup>1</sup> M.K. Kim,<sup>2,3</sup> K.M. Huh<sup>1</sup> (<sup>1</sup>Chungnam National University, <sup>2</sup>MKbiotech Inc., <sup>3</sup>College of Agriculture and Life Science)  
Multifunctional Octanoyl Glycol Chitosan/Gallic Acid Hybrid Thermogels: Integrating Antibacterial, Antioxidant, and Hemostatic Properties for Advanced Wound Care
- 2P15** K. Tanaka, Y. Kawaguchi, R. Wakabayashi, N. Kamiya, M. Goto (Kyushu University,)  
Development of transdermal vaccine formulation by adding CPE to Solid-in-Oil formulation
- 2P16** R. Nishioka, K. Murozono, Y. Kawaguchi, M. Kimura, N. Kamiya (Kyushu University)  
Dramatic alteration of the modification site of native IgG antibody by rearrangement of fusion protein partners
- 2P17** T. Higashi, K. Toyofuku, R. Wakabayashi, N. Kamiya, M. Goto (Kyushu University)  
Transdermal delivery of mRNA using ionic liquid preparations and its potential for cancer therapy
- 2P18** M. Sakari, T. Tsukahara, E. Miyako (Japan Advanced Institute of Science and Technology)  
RNA methyltransferase METTL3 coordinates transcription and RNA methylation
- 2P19** R. Nakanishi,<sup>1</sup> T. Murakami<sup>1,2</sup> (<sup>1</sup>Toyama Prefectural University, <sup>2</sup>Kyoto University)  
Development of endothelial cell-adhesive high-density lipoprotein nanoparticles for treatment of sepsis
- 2P20** M.H. Shahid, R. Rajan, K. Matsumura (Japan Advanced Institute of Science and Technology)  
Efficacy of Cationic Polymer coated MgO Nanoparticles as Anticancer Drug Candidate
- 2P21** J. Li,<sup>1</sup> N. Morita,<sup>2</sup> R. Miura,<sup>1</sup> Y. Kimura,<sup>1</sup> R. Shinkura,<sup>2</sup> T. Kondo<sup>1</sup> (<sup>1</sup>Kyoto University, <sup>2</sup>The University of Tokyo)  
Effects of Surface Charges in Liposome-based Nasal Drug Delivery System for Allergy Treatment
- 2P22** H. Kurita,<sup>1</sup> Y. Mizukami,<sup>1</sup> R. Nakanishi,<sup>1</sup> S. Shibukawa,<sup>1</sup> R. Fukuda,<sup>1</sup> F. Kawanishi,<sup>1</sup> Y. Nagai,<sup>1</sup> T. Murakami<sup>1,2</sup> (<sup>1</sup>Toyama Prefectural University, <sup>2</sup>Kyoto University)  
Preparation of thermosensitive lipid nanoparticles using apolipoprotein A-I-derived peptide and evaluation of the biological activities
- 2P23** T. Hatta, Y. Tonomura, K. Okeyoshi (Japan Advanced Institute of Science and Technology)  
Preparation of Various Polysaccharide Membranes Having Oriented Microstructures by Meniscus Splitting Method
- 2P24** M. Irie,<sup>1</sup> M. Yamagata,<sup>1</sup> Y. Nagakawa,<sup>2</sup> S. Fujita<sup>1</sup> (<sup>1</sup>University of Fukui, <sup>2</sup>Tokyo Metropolitan Industrial Technology Research Institute)  
Fabrication of Transparent Polymer Film Incorporating Elongated and Aligned Cellulose Nanofibers
- 2P25** H. Mizuno, S. Fujita (University of Fukui)  
Production of Fully Biomass-Based Fine Fibers from Natural Rubber and Cellulose
- 2P26** P. Xia, S. Fujita (University of Fukui)  
High Density Cell Culture on Porous Edible Cryogel Aiming for Cultured Meat

- 2P27** X. H. Ren, M. Yoshita, S. Fujita (University of Fukui)  
Electrospun PU/PVDF Nanofibers with a Phase-Separated Structure for Improved Electret Performance
- 2P28** Y. C. Tsai,<sup>1</sup> S. Fujita,<sup>1</sup> M. Y. Chou<sup>2</sup> (<sup>1</sup>University of Fukui, <sup>2</sup>ROHER Technology Co.)  
Cytotoxicity of Nanoparticles-Encapsulated *Androdia camphorata* extracts
- 2P29** K. Raje, K. Ohashi, S. Fujita (University of Fukui)  
Electrospinning of 3D Fibrous Scaffolds
- 2P30** Z. T. Shen, F. Satoshi, H. Miyajima (University of Fukui)  
AMF-Controlled Deformation of Nonwoven Fabrics Combined with Iron Particles and Temperature-Responsive Polymer
- 2P31** D. Zhao, R. Rajan, K. Matsumura (Japan Advanced Institute of Science and Technology)  
The synthesis of removable protein aggregation inhibitor nanoparticles
- 2P32** A. Rajeev, K. Matsumura (Japan Advanced Institute of Science and Technology)  
Proteins on Guard: Zwitterionic Polymer-Infused Chitosan Hydrogel for Targeted Cytokine Delivery
- 2P33** Y. Zhang,<sup>1</sup> T. Yamaguchi,<sup>1,2,3</sup> (<sup>1</sup>Japan Advanced Institute of Science and Technology, <sup>2</sup>Nagoya City University, <sup>3</sup>National Institutes of Natural Sciences)  
Conformational dynamics of oligosaccharides related to a protein quality control system studied by molecular simulation and data clustering
- 2P34** H. Feng,<sup>1</sup> T. Yamaguchi<sup>1,2,3</sup> (<sup>1</sup>Japan Advanced Institute of Science and Technology, <sup>2</sup>Nagoya City University, <sup>3</sup>National Institutes of Natural Sciences)  
Development of a method for structural characterization of glycolipid glycans using ion mobility spectrometry
- 2P35** M. Furuhashi,<sup>1</sup> T. Yamaguchi<sup>1,2,3</sup> (<sup>1</sup>Japan Advanced Institute of Science and Technology, <sup>2</sup>Nagoya City University, <sup>3</sup>National Institutes of Natural Sciences)  
Elucidation and control of the hydration structure of carbohydrates based on molecular dynamics simulations
- 2P36** K. Murozono, R. Nishioka, Y. Kawaguchi, M. Kimura<sup>1</sup>, N. Kamiya (Kyushu University)  
Proximity-based enzymatic protein labeling for the site-specific functionalization of antibody fragments
- 2P37** Y. Taoka, K. Matsumura (Japan Advanced Institute of Science and Technology)  
Cryopreservation of spheroids with sulfobetaine-based intracellularly permeable polymers
- 2P38** L. Wu, K. Okeyoshi (Japan Advanced Institute of Science and Technology)  
Convective Self-assembly of Polysaccharide Particles in Meniscus Splitting
- 2P39** N. Sang, Y. Qi, S. Nishimura, E. Miyako (Japan Advanced Institute of Science and Technology)  
Biomimetic functional nanocomplexes for photothermal cancer chemo-immunotheranostics
- 2P40** K. Suzuki, K. Matsumura (Japan Advanced Institute of Science and Technology)  
Synthesis and Evaluation of Donor-Acceptor Conjugated Polymers for Thermo-responsive Protein DDS
- 2P41** K. Hirota,<sup>1</sup> T. Nakaji-Hirabayashi,<sup>1</sup> K. Nakagawa,<sup>2</sup> R. Ishihara<sup>2</sup> (<sup>1</sup>University of Toyama, <sup>2</sup>Kitagawa Iron Works Co., Ltd.)

Understanding of the effects of gravity-controlled environments on the proliferation and differentiation of human mesenchymal stem cells.

- 2P42** M. Kato,<sup>1</sup> T. Nakaji-Hirabayashi<sup>1,2</sup> (<sup>1</sup>University of Toyama, <sup>2</sup>NIMS)  
Next-Gen Artificial Breasts: From Stable Scaffolds to Efficient Adipocyte Collection
- 2P43** R. Takagi,<sup>1</sup> C. Yoshikawa,<sup>2</sup> T. Nakaji-Hirabayashi<sup>1,2</sup> (<sup>1</sup>University of Toyama, <sup>2</sup>NIMS)  
Formation of a Cell Scaffold Using Photo-crosslinkable Polymers for Artificial Cartilage Tissue Construction
- 2P44** M. Miyahara, E. Miyako (Japan Advanced Institute of Science and Technology)  
Photocatalytic scaffolds enhance anticancer performances of bacterial consortium AUN
- 2P45** S. Iwata, M. Miyahara, E. Miyako (Japan Advanced Institute of Science and Technology)  
Discovery of Intratumoral Oncolytic Bacteria Toward Targeted Anticancer Theranostics
- 2P46** A. Takahashi, K. Matsumura (Japan Advanced Institute of Science and Technology)  
Gelatin-dextran hydrogel as an injectable cell scaffold
- 2P47** Y. Kato, A. Takahashi, K. Matsumura (Japan Advanced Institute of Science and Technology)  
A new field of cryopreservation opened up by correlating the function and localization of polymeric cryoprotectants
- 2P48** Y. Kuwajima,<sup>1</sup> S. Nagaya,<sup>1</sup> Y. Kikuchi,<sup>1</sup> I. Yasuda,<sup>1</sup> Y. Kamikubo,<sup>2</sup> E. Morishita<sup>1,3</sup> (<sup>1</sup>Kanazawa University, <sup>2</sup>Thrombo Translational Research Lab Inc., <sup>3</sup>Kanazawa University Hospital)  
Molecular Mechanism Underlying Functional Defects in the Prothrombin Variant Segovia that Cause Bleeding Tendency
- 2P49** Y. Kikuchi,<sup>1</sup> S. Nagaya,<sup>1</sup> T. Togashi,<sup>1</sup> Y. Imai,<sup>1</sup> M. Togashi,<sup>1</sup> Y. Arais,<sup>1</sup> T. Nishiuchi,<sup>1</sup> E. Morishita<sup>1,2</sup> (<sup>1</sup>Kanazawa University, <sup>2</sup>Kanazawa University Hospital)  
Mechanism of antithrombin deficiency due to the novel variant C32W in the C-terminus of the signal peptide