

# 17<sup>th</sup> Annual Meeting of Nano Biomedical Society

Title: Cutting-edge nanobio research based on precise molecular design

Date : November 8 (Tue), 2022

Place: Online (Zoom)

President of 17<sup>th</sup> Annual Meeting:

Prof. Kanjiro MIYATA

Department of Materials Engineering, Univ. of Tokyo

Co-organized by the Grant-in-Aid for Transformative Research Areas: Polymer Evolution  
(PI: Prof Y. Hoshino, Kyushu Univ)

Supported by The Japanese Tissue Culture Association

Contact Prof. Kanjiro MIYATA (Department of Materials Engineering, Univ. of Tokyo)

7-3-1 Hongo Bunkyo-ku Tokyo 113-8656 Tel: +81-3-5841-8647

E-mail: 17nanobiomed@bmw.t.u-tokyo.ac.jp

## Program of the 17<sup>th</sup> Annual Meeting

9:00-9:05 Opening Remarks

General Session

General Session I

Chair : Ikuko Matsunaga (Univ. of Tokyo) / Toshiaki Takezawa (NARO)

9:05-9:20 O-I-1

### **Brain tumor targeting of immune checkpoint inhibitors by detachable antibody PEGylation**

Yuki Mochida, Tao Yang, Xueying Liu, Hiroaki Kinoh, Horacio Cabral, Kazunori Kataoka  
Kawasaki Institute of Industrial Promotion,  
Innovation Center of NanoMedicine

9:20-9:35 O-I-2

### **Polydopamine-mediated surface functionalization of extracellular vesicles**

Chenyu Wang and Hirotaka Ejima  
Department of Materials Engineering,  
The University of Tokyo

9:35-9:50 O-I-3

### **Analysis of protein adsorption and bactericidal ability of the well-controlled cationic polymer brush surfaces**

Tsukuru Masuda, Yoichi Watanabe, Madoka Takai  
Department of Bioengineering, School of Engineering,  
The University of Tokyo

9:50-10:05 O-I-4

### **A promoted redox activity of copper complexes by forming locally concentrated state through installing on the polymer chains toward antibacterial application**

Shigehito Osawa<sup>1</sup>, Kenichi Kitanishi<sup>1</sup>, Maho Kiuchi<sup>2</sup>, Motoyuki Shimonaka<sup>1,2</sup>, Hidenori Otsuka<sup>1,2</sup>  
<sup>1</sup>Fac. of Sci., Tokyo Univ. of Sci.  
<sup>2</sup>Grad. Sch. of Sci., Tokyo Univ. of Sci.

10:05-10:20 O-I-5

### **Effects of fine powders in hybrid resins for CAD/CAM crowns on rodent cells**

Mariko Nakai<sup>1</sup>, Koichi Imai<sup>2</sup>, Yoshiya Hashimoto<sup>3</sup>, Nobutaka Okusa<sup>1</sup>  
<sup>1</sup>Department of Forensic Dentistry, Osaka Dental University,  
<sup>2</sup>Department of Tissue Engineering, Osaka Dental University,  
<sup>3</sup>Department of Biomaterials, Osaka Dental University

10:20-10:35 O-I-6

**Construction of AAV delivery systems based on phenylboronic acid-conjugated polymers and polyphenol molecules**

Yuto Honda<sup>1,2</sup>, Shuhei Nagao<sup>1,2</sup>, Hiroaki Kinoh<sup>3</sup>, Nozomi Matsudaira<sup>1,2</sup>,  
Liu Xueying<sup>3</sup>, Takahiro Nomoto<sup>1,2</sup>, Dirisala Anjaneyulu<sup>3</sup>, Nobuhiro Nishiyama<sup>1,2</sup>

<sup>1</sup>Department of Life Science and Technology, School of Life Science and Technology,

<sup>2</sup>Laboratory for Chemistry and Life Science, Institute of Innovative Research,  
Tokyo Institute of Technology

<sup>3</sup>Innovation Center of Nanomedicine (iCONM),  
Kawasaki Institute of Industrial Promotion

10:35-10:50 O-I-7

**Improvement of Immunostimulant Activity of CpG Oligodexynucleotides by Formation of Guanine-Quadruplex Structure**

Yamazaki T<sup>1,2</sup>, Tu A<sup>1,2</sup>, Le N<sup>1,2</sup>, Pathak S<sup>1,2</sup>, Tsukakoshi K<sup>3</sup>, Ikebukuro K<sup>3</sup>

<sup>1</sup>Res. Cent. Funct. Mater., NIMS, <sup>2</sup>Grad. Sch. Life Sci., Hokkaido Univ.,

<sup>3</sup>Grad. Sch. Tech., Tokyo Univ. Agric. Technol.

10:50-11:00 Break

General Session II

Chair : Koki Kanehira (TOTO Ltd.) / Akira Taniguchi (NIMS)

11:00-11:14 O-II-1

**Effect of UV Irradiation on the Surface of Collagen-Derived Cell Scaffold Sheets**

Keita Haraguchi<sup>2</sup>, Yushi Oishi<sup>2</sup>, Shigehisa Aoki<sup>1,3</sup>, Toshiaki Takezawa<sup>1,4</sup>, Takayuki Narita<sup>1,2</sup>

<sup>1</sup>Vitrigel Collaboration Laboratory between NARO and Saga University,

<sup>2</sup>Department of Chemistry and Applied Chemistry, Saga University.

<sup>3</sup>Department of Pathology, Saga University.

<sup>4</sup>Institute of Agrobiological Sciences,

National Agriculture and Food Research Organization

11:14-11:28 O-II-2

**Bioabsorbable microneedle device for access to blood vessels**

Yukihiro Kanda, Hiroaki Takehara, Takanori Ichiki

Department of Materials Engineering, School of Engineering,

The University of Tokyo

11:28-11:42 O-II-3

**Study of a drug delivery system composed of poly(vinyl alcohol) and D-4-boronophenylalanine for boron neutron capture therapy**

Kakeru Konarita<sup>1,2</sup>, Takahiro Nomoto<sup>1,2</sup>, Minoru Suzuki<sup>3</sup>, Nobuhiro Nishiyama<sup>1,2</sup>

<sup>1</sup>Laboratory for Chemistry and Life Science,

Institute of Innovative Research, Tokyo Institute of Technology,

<sup>2</sup>School of Life Science and Technology, Tokyo Institute of Technology,

<sup>3</sup>Institute for Integrated Radiation and Nuclear Science, Kyoto University

11:42-11:56 O-II-4

**Physical properties and nose-to-brain delivery of nanoparticles composed of PEGPCL block copolymers with different molecular weights of PEG and PCL**

Shingo Iioka<sup>1</sup>, Takanori Kanazawa<sup>1</sup>, Tamaki Yoshida<sup>1</sup>, Shunsuke Aoki<sup>1</sup>, Takayuki Terukina<sup>1</sup>, Kenjiro Azuma<sup>2</sup>, Masatoshi Maeki<sup>3</sup>, Manabu Tokeshi<sup>3</sup>, Hiromu Kondo<sup>1</sup>  
<sup>1</sup>Graduate School of Pharmaceutical Sciences, University of Shizuoka,  
<sup>2</sup>Laboratory of Pharmaceutical Technology, Chiba University,  
<sup>3</sup>Faculty of Engineering, Hokkaido University

11:56-12:10 O-II-5

**Temperature-responsive polyion complex structures capable of sustained release of micelles constructed from oligonucleotides**

Hiroshi Kamizawa<sup>1</sup>, Rento Ota<sup>1</sup>, Ziwei Ma<sup>2</sup>, Teruki Nii<sup>2</sup>, Takeshi Mori<sup>2,3</sup>,  
Yoshiki Katayama<sup>2,3,4,5</sup>, Akihiro Kishimura<sup>2,3,4,6</sup>  
<sup>1</sup>Grad. Sch. Sys. Life Sci., Kyushu Univ, <sup>2</sup>Dept. of Applied Chem., Fac. of Eng., Kyushu Univ.,  
<sup>3</sup>Ctr. for Molecular Systems, Kyushu Univ, <sup>4</sup>Ctr. for Future Chem., Kyushu Univ.,  
<sup>5</sup>The Ctr. For Adv. Med. Innov., Kyushu Univ.,  
<sup>6</sup>RIKEN Center for Emergent Matter Science

12:10-12:24 O-II-6

**Precisely regulated PEGylation of mRNA for enhanced systemic delivery via polymeric nanoparticles**

Kohki Yamada<sup>1</sup>, Jongmin Yum<sup>1</sup>, Mitsuru Naito<sup>1</sup>, Satoshi Uchida<sup>2</sup>, Hyun Jin Kim<sup>3</sup>, Kanjiro Miyata<sup>1</sup>  
<sup>1</sup>Graduate School of Engineering, The University of Tokyo, Japan,  
<sup>2</sup>Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Japan,  
<sup>3</sup>College of Engineering, Inha University, Korea.

12:24-12:38 O-II-7

**Design of thrombin-binding bivalent aptamers and control of their anticoagulant activity**

Kazuki Kubota<sup>1</sup>, Masanobu Nagano<sup>1</sup>, Asuka Sakata<sup>2</sup>, Keitaro Yoshimoto<sup>1</sup>  
<sup>1</sup>Graduate School of Arts and Sciences, The University of Tokyo,  
<sup>2</sup>Nara Medical University

12:40-13:20 Break

13:20-13:30 General Meeting of the Society of Nano Biomaterials

## **Symposium I**

Chair : Kanjiro Miyata (Univ. of Tokyo)

13:30-14:00 S-I-1

### **mRNA engineering for nano-drug delivery systems and vaccines**

Satoshi Uchida

Medical Chemistry, Graduate School of Medical Science,  
Kyoto Prefectural University of Medicine

14:00-14:30 S-I-2

### **DNA nanobiotechnology based on structural biomimetics**

Jiro Kondou

Faculty of Science and Technology of Sophia University

14:30-14:40 Break

14:40-15:10 S-I-3

### **Rational design of short DNA strand-based engineering for precise nanobiomaterials**

Yoshitsugu Akiyama

Institute of Arts and Sciences, Katsushika Division,  
Institute of Arts and Sciences, Tokyo University of Science

15:10-15:40 S-I-4

### **Nucleic acid aptamer therapeutics for blood diseases**

Keitaro Yoshimoto

Sciences, Graduate School of Arts and Sciences,  
The University of Tokyo

15:40-15:50 Break

## **Symposium II**

Chair : Keitaro Yoshimoto (Univ. of Tokyo)

15:50-16:20 S-II-1

### **Evolution of Precise Polymers that Recognize Peptides**

Yu Hoshino

Department of Applied Chemistry,  
Faculty of Engineering, Kyushu University

16:20-16:50 S-II-2

### **Design of synthetic polymer nanoparticles for sepsis therapy**

Hiroyuki Koide

Department of Medical Biochemistry, School of Pharmaceutical Sciences,  
University of Shizuoka

16:50-17:00 Excellent Presentation Award Ceremony

17:00-17:05 Closing Remarks

*Winners of two Awards at the 17<sup>th</sup> Annual Meeting of the Nano Biomedical Society*

Annual Conference Award (*for postdoctoral fellow, and above*)

O-I-1

**Brain tumor targeting of immune checkpoint inhibitors by detachable antibody PEGylation**

Yuki Mochida

Kawasaki Institute of Industrial Promotion,

Innovation Center of NanoMedicine

Encouragement Award (*for students*)

O-II-6

**Precisely regulated PEGylation of mRNA for enhanced systemic delivery via polymeric nanoparticles**

Kohki Yamada

Graduate School of Engineering, The University of Tokyo, Japan