



KANSAI UNIVERSITY



Japan – EU International Research Workshop 2018

# Workshop on Smart Materials for Advanced and Reliable Therapeutics

— Future Medical Applications by Kansai University Medical Polymer (KUMP) —

Monday, 5<sup>th</sup> 16:00 | AUDITORIUM ON4  
November, 1 | 04.330  
2018 18:30 | Herestraat 49 3000 LEUVEN

Reception 19:00- ON4 Building, Entrance Hall (ON4: 04:16)

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# Japan – EU International Research Workshop 2018

## KU-SMART PROJECT

Kansai University **S**mart Materials  
for **A**dvanced and **R**eliable Therapeutics

**2016 Project selected  
for the Private University  
Research Branding Project  
by MEXT\***

Kansai University Smart Materials for Advanced and Reliable Therapeutics (KU-SMART) is a project with Osaka Medical College to develop a robust platform for medicine-engineering collaboration. With such a platform, we are working to develop medical material and systems that accord with medical doctors' needs, merchandise these materials as globally competitive medical devices, and deliver them to all People in clinical setting (patients and medical doctors).

Member

Kansai University 13people.

Osaka Medical College 12people.

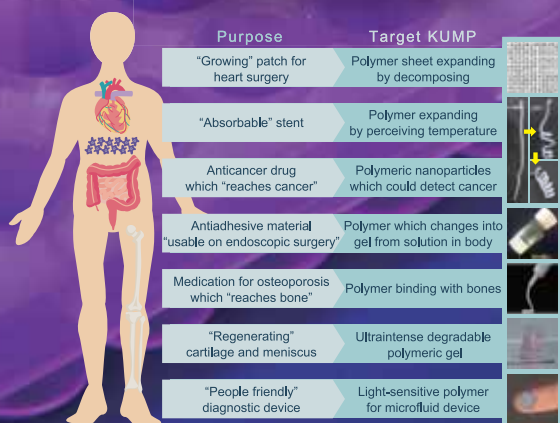
## A stage for presenting Kansai University's knowledge



President,  
Kansai University  
**Prof. SHIBAI, Keiji**

KU-SMART PROJECT is a big project by our university.

The number of biomaterial researchers in Kansai University is one of the largest in Japan and has become a great research base. We will keep manufacturing future medical treatment that reaches people in Japan and the world by gathering researchers' wisdom and cooperating with private enterprises.



Kansai University's Medical Polymer  
will create future medical treatment.



\* Ministry of Education, Culture, Sports, Science and Technology-Japan

# Program

- 16:00 Kansai University Presidential address (Prof. SHIBAI, Keiji / President, Kansai University)  
16:15 - 18:15 Speakers' Presentation  
18:15 Wrap-up  
18:30 Closing  
19:00 Reception

## Speaker

16:15-16:45



Prof.  
**OHYA, Yuichi**

Professor  
Department of Chemistry  
and Materials Engineering,  
Collaborative Research Center of  
Engineering,  
Medicine and Pharmacology (CEMP)  
Kansai University

E-mail: yohya@kansai-u.ac.jp

**"Biodegradable injectable polymer systems for drug delivery, cell therapy and anti-adhesive materials"**

We developed a new biodegradable injectable polymer (IP) systems, which exhibit transition from solution to hydrogel in response to human body temperature after injection and subsequent covalent cross-linking. The hydrogel obtained from this system showed significantly longer and controllable duration time of gel state after subcutaneous injection in mice compared with conventional physical gelation systems. We then investigated the potential utility of the IP systems as a depot for sustained drug releasing system of peptide hormone, a therapeutic system for adipose-derived stem cell delivery, and an anti-adhesive material which can be applied for a laparoscopic surgery.

16:45-17:15



Prof.  
**MIYATA, Takashi**

Professor  
Department of Chemistry  
and Materials Engineering,  
Faculty of Chemistry,  
Materials and Bioengineering  
Kansai University

E-mail: tmiyata@kansai-u.ac.jp

**"Smart Polymers with Dynamic Crosslinks for Medical Applications"**

We proposed a novel strategy for designing stimuli-responsive gels that undergo changes in the volume in response to a target biomolecule; our strategy uses molecular complexes as dynamic crosslinks that dissociate and associate in response to a target biomolecule. This paper focuses on smart medical polymers using dynamic crosslinks for biosensors, drug delivery and cell regulation. For example, dual stimuli-responsive polymers that underwent sol-gel transition in response to light/temperature and light/biomolecule were strategically designed using dynamic crosslinks such as photo-crosslinkers and biomolecular complexes. Cell behavior was regulated using the dual stimuli-responsive polymers. In addition, smart polymer films, particles and hydrogels with dynamic crosslinks have many medical applications for fabricating sensor, DDS and cell culture.

17:15-17:45



Prof.  
**KAKINOKI, Sachiro**

Associate professor  
Department of Chemistry  
and Materials Engineering,  
Faculty of Chemistry,  
Materials and Bioengineering  
Kansai University

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**"Amino acid anchoring surface modification for bioactive vascular prostheses and tissue engineering scaffolds"**

Implant materials prefer to possess not only compatibility with blood or tissue but also bioactivities including specific cell adhesion, migration and proliferation for promoting tissue regeneration. Since bioactivities are not inherent in most materials used in clinical treatment, the modification of material surface with biological recognition molecules has attracted attention as a strategy for the development of bioactive devices. Recently, we developed the single-step immobilization procedure of biological molecules onto several kinds of material surfaces through the direct oxidation of tyrosine anchor. In this talk, our recent progress about the surface immobilization of bioactive molecules with tyrosine anchor for re-endothelialization promoting vascular prostheses and cell adhesiveness magnesium scaffolds.

17:45-18:15



Prof.  
**THORREZ, Lieven**

Associate professor  
Department of Development  
and Regeneration  
Faculty of Medicine  
KU Leuven

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**"Developments, challenges and applications of human skeletal muscle tissue engineering"**

This presentation will provide a very brief overview of work in the Tissue Engineering Lab of Kulak, focussed on human skeletal muscle tissue engineering.



## Special Announcement

January, 24<sup>th</sup>-25<sup>th</sup>, 2019

Kansai University  
Medical Polymer (KUMP)  
International Symposium



Kansai University Centenary Memorial Hall (Japan)  
URL: <https://wps.itc.kansai-u.ac.jp/kumpis/>

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Kansai University



contact

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