# International Workshop on Biomedical Engineering at Osaka Institute of Technology

Abstracts

November 16, 2014

Department of Biomedical Engineering Osaka Institute of Technology

### Preface

It is a great honor and pleasure for us to welcome you all to the International Workshop on Biomedical Engineering at Osaka Institute of Technology. I would like to express our sincere gratitude to all participants.

Founded in 1922, Osaka Institute of Technology (OIT) celebrated its 90th anniversary in 2012. Since its establishment, OIT plays an integral role in fulfilling our institution's mission of providing education and conducting researches that lead to a safe and prosperous society.

As a part of such activities, OIT has initiated annual international workshop in 2011 to enhance the collaboration with overseas institutions by exchanging advanced research knowledge. A different thematic area has been selected for each year. In 2011, "The International Workshop on Advanced Materials and Devices" was organized by the Nanomaterials Microdevices Research Center of OIT. The following year, "OIT International Workshop" was organized by the Structure Research Center and focused on Front Research and Technology in Structural Engineering. Last year, "OIT International Workshop" was organized by the Department of Robotics and focused on Human Friendly Robotics.

Then, this year, "The International Workshop on Biomedical Engineering at OIT" is organized by the Department of Biomedical Engineering (BME). This workshop aims to make opportunities for researchers and engineers to exchange their knowledge and to discuss issues regarding recent research developments and technologies in medical engineering, bioengineering, and biological science.

Educational aspect is also relevant for this workshop, so our undergraduate and graduate students are encouraged to participate and discuss their research topics with invited researchers. For this purpose, the invited lecturers who present in oral sessions are kindly asked to discuss details with the audiences in the following poster session. We appreciate for their extra work.

I hope you all enjoy participating in this workshop and exchange information, knowledge, and friendship professionally and personally, and of course, enjoy staying in Osaka during this beautiful autumn season.

Vinjuli Metan

Kiyoshi Matsumura, Ph.D Workshop Chair Professor, Director of Department of Biomedical Engineering Osaka Institute of Technology

International Workshop on Biomedical Engineering at Osaka Institute of Technology

Organized by Department of Biomedical Engineering (BME), Faculty of Engineering Osaka Institute of Technology (OIT) 5-16-1 Omiya, Asahi-ku, Osaka 535-8585, JAPAN http://www.oit.ac.jp/english/index.html

> **Workshop Chair** Prof. Kiyoshi Matsumura, Director of BME

Organizing Committee Chair Prof. Toshia Fujisato, Former Director of BME

> Prof. Toshihisa Ohshima, BME Prof. Masahiko Yoshiura, BME Prof. Emiko Okuda-Ashitaka, BME Prof. Ko-ichi Kawahara, BME Assoc. Prof. Sadahito Uto, BME Assoc. Prof. Hiroyuki Tonami, BME Lecturer Taketo Ohmori, BME

Advisory Committee Prof. Yutaka Kawata, Vice President of OIT Prof. Yasushi Nishimura, Dean of Faculty of Engineering, OIT Mr. Mitsuo Kimura, OIT International Center

### **Workshop Venue**

The workshop is held in the OIT Omiya Campus, 5-16-1 Omiya, Asahi-ku, Osaka 535-8585.

10:00-12:10 Room 1041:Sessions 1 and 212:20-13:05 Dining Hall 2F: Session 313:15-14:55 Room 1041:Session 415:05-17:30 Dining Hall 3F: Sessions 5 and 6



From Osaka Itami Airport: 60min

Osaka Airport →(*Osaka Monorail*)→ Dainichi →(*Subway Tanimachi*)→ Taishibashi-Imaichi **From Osaka Kansai International Airport: 90-100min** 

Kansai Airport →(*Limousine Bus\**)→ Dainichi →(*Subway Tanimachi*)→ Taishibashi-Imaichi Kansai Airport →(*JR Kansai Kuko*)→ Tennoji →(*Subway Tanimachi*)→ Sembayashi-Omiya Kansai Airport →(*Nankai Kuko*)→ Namba →(*Subway Midosuji*)→ Nakatsu →(*Bus #34\*\**)→ Nakamiya From Shin-Osaka or Osaka Stations: 30-40min

Shin-Osaka  $\rightarrow$  (Subway Midosuji) $\rightarrow$  Nakatsu  $\rightarrow$  (Bus #34\*\*) $\rightarrow$  Nakamiya

Shin-Osaka  $\rightarrow$  (*JR Kyoto*) $\rightarrow$  Osaka  $\rightarrow$  (*Bus* #34\*\*) $\rightarrow$  Nakamiya

Shin-Osaka  $\rightarrow$  (JR Kyoto) $\rightarrow$  Osaka/Higashi-Umeda  $\rightarrow$  (Subway Tanimachi) $\rightarrow$  Sembayashi-Omiya

\*Limousine Bus runs at intervals of 1hour, \*\*Bus #34 runs at intervals of 5min in daytime on Sundays



### From Osaka station bus stop (Osaka Ekimae Bus Terminal):



http://www.kotsu.city.osaka.lg.jp/foreign/english/busStop.html

## From Nakamiya bus stop (3min) or Sembayashi-Omiya and Taishibashi-Imaichi subway stations (15min) to OIT Omiya Campus:



\*Bus #10 and \*\*Bus #34 runs at intervals of 20min and 5min in daytime on Sundays, respectively Map data ©2014 Google, ZENRIN

### Estimated taxi fares to OIT Omiya Campus (Osaka Kogyo Daigaku in Japanese)

From Shin-Osaka Station: 20min, ¥2,400 From Osaka Station: 20min, ¥2,300 From Dainichi Station: 15min, ¥1,800

### **Workshop Program**

November 16, 2014 [Room 1041]	
Session 1: Opening & Introduction of OIT	(Chair: Prof. Toshia Fujisato, BME)
10:00-10:05 Opening Remark	Prof. Yutaka Kawata, Vice President of OIT
10:05-10:15 Summary of OIT	Prof. Yutaka Kawata, Vice President of OIT
10:15-10:30 Summary of BME	Prof. Kiyoshi Matsumura, Director of BME
Session 2: Invited Lecture 1	
(Chair: Prof. Toshihisa Oh	shima & Prof. Emiko Okuda-Ashitaka, BME)
10:30-10:50 Glycolysis in hyperthermophiles: unusual pathways and enzymes in	
ancestral organisms Pro	f. Peter Schönheit (Kiel University, Germany)
10:50-11:10 Bioartificial pancreas: slow progress but much promise	
Assist. Prof. Kai-Chi	ang Yang (Taipei Medical University, Taiwan)
11:10-11:30 Vascular tissue engineering in d	iabetes
Assist. Prof. As	gneta Simionescu (Clemson University, USA)
11:30-11:50 The role of patent system	
Dr. Hoon-Sik Shir	n (Korean Intellectual Property Office, Korea)
11:50-12:10 Pathophysiological mechanisms	s of hypersomnia: from animal studies to
bedside F	Prof. Seiji Nishino (Stanford University, USA)

[Dining Hall 2F] Session 3: Lunch Break with Poster Discussion for Session 2

(Chair: Assoc. Prof. Hiroyuki Tonami, BME)

12:20-13:05

[Room 1041] Session 4: Invited Lecture 2 (Chair: Drof, Maashika Yashiyur, & Drof, Kalishi Kayahara, DM

(Chair: Prof. Masahiko Yoshiura & Prof. Ko-ichi Kawahara, BME)

13:15-13:35 Artificial muscle based on conducting polymers	
	Prof. Keiichi Kaneto (Kyushu Institute of Technology, Japan)
13:35-13:55 Multiple microfluidic stream based manipulation for single cell	
	Assist. Prof. Yaxiaer Yalikun (Osaka University, Japan)

13:55-14:15 Cells & ceramics: toolkit for skeletal tissue reconstruction in medicine

Dr. Annie John

(Sree Chitra Tirunal Institute for Medical Sciences & Technology, India)

14:15-14:35 Stem cells and scaffolds for heart valve tissue engineering

Assoc. Prof. Dan Simionescu (Clemson University, USA)

14:35-14:55 Keratin protein degradome: inflammation key to understanding periodontal disease

Assist. Prof. Salunya Tancharoen (Mahidol University, Thailand)

[Dining Hall 3F]

#### Session 5: Invited Poster Presentation & Poster Discussion for Session 4

(Chair: Assoc. Prof. Sadahito Uto, BME)

15:05-15:50 Protective effect of anthocyanin extract from *Oryza sativa L*. on fluorouracil in oral mucositis rat model

Dr. Prana Shakya (Mahidol University, Thailand) The role of nitric oxide in *Schizosaccharomyces Pombe* under oxidative stress conditions

Dr. Astuti Rika Indri (Nara Institute of Science & Technology, Japan) A host factor GANP is involve in anti-HIV-I infectivity response by facilitating the encapsidation of APOBEC3G into virion cores

Dr. Sarah Almofty (Kumamoto University, Japan) Enhancement of wound healing by controlled release of a macrophage recruitment agent and stromal-cell-derived factor-1

Dr. Yang-Hee Kim (Kyoto University, Japan) Development of technologies for low-cost and multiplexed detection of microbial pathogens Dr. Dieter Tourlousse (National Institute of Advanced Industrial Science and Technology, Japan)

Session 6: Banquet with Poster Presentation by OIT students

(Chair: Prof. Toshia Fujisato and Lect. Taketo Ohmori, BME)

16:00-16:45 Transcriptional regulation in brown adipose tissue: possible involvement of nuclear factor kappa B Tomohiro Inoue (physiology Lab) Mechanisms of fever following intracranial hemorrhage Yuki Hirai (physiology Lab) In vitro anti-thrombotic evaluation of biomaterials by using the ATP-luminescence method Naoaki Ishino (Biomaterials Lab) Effect of heat stimulation on contractile properties of tissue-engineered skeletal muscle Shunya Takagi (Biomaterials Lab)

Tissue-engineered skeletal muscle using collagen sponge scaffold Shohei Hatoma (Biomaterials Lab) Production of nitric oxide in the spinal cord of streptozotocin-induced diabetic mice Kana Ohno (Molecular and Functional Biology Lab) Nociceptin-induced allodynia via JNK activation in spinal cord Kenta Kawabata (Molecular and Functional Biology Lab) Extracellular histones activate IL-1ß production in macrophages Kae Oike (Functional foods Lab) Study on contraction of cultured muscle cells with Grayanotoxin Bayan Almofty (Bioelectronics Lab) Study on local electrical impedance tomography with small electrode array Masayuki Kobayashi (Bioelectronics Lab) SPR of liquid crystal thin film using a high refractive index prism Haruka Kawai (Bioelectronics Lab) Development of display using hydroxypropyl cellulose liquid crystal Hikaru Sugawa (Bioelectronics Lab) 16:45-17:25 Banquet continued

17:25-17:30 Closing Remark

Prof. Kiyoshi Matsumura, Director of BME