

Finland-Japan Workshop:
The next generation medical engineering in biomaterials

Joint with **3rd Bone and Biomaterials Workshop**



June 17-21, 2018

Oulu, Finland

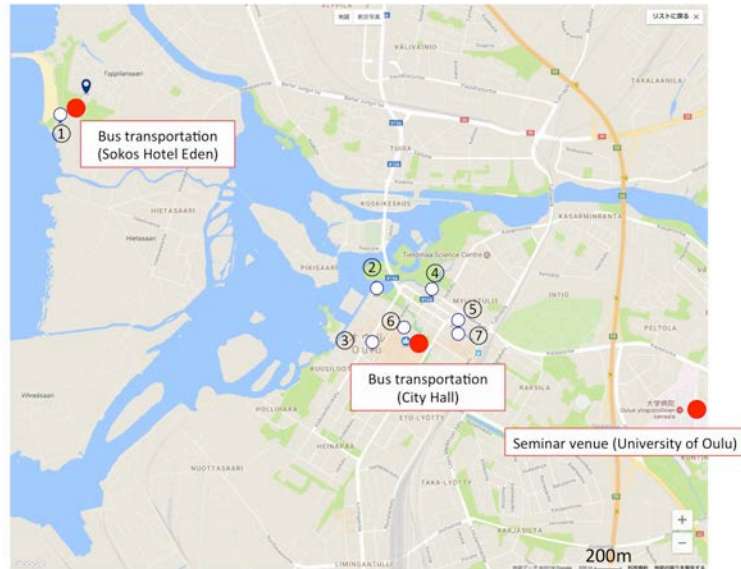
<http://ouluhealth.fi/event/finland-japan-workshop-next-generation-medical-engineering-biomaterials/>

General information

■ Venue

University of Oulu, Medical Campus

Location: Aapistie 5 A, Oulu, Finland



Bus transportation by University of Oulu (18-20 June)

| | |
|--------------------------------------|--------------------|
| 7:15 | Sokos Hotel Eden |
| 7:30 | Front of City Hall |
| 7:45 | University of Oulu |
| 15 minutes after the end of lectures | University of Oulu |
| + 15 minutes | Front of City Hall |
| + 15 minutes | Sokos Hotel Eden |

Public transportation

| No. | Hotel | Bus transportation |
|-----|---------------------------------|---|
| 1 | Sokos Hotel Eden | N/A |
| 2 | Radisson Blu Hotel | Public bus lines: 1, 2, 7, 10, 20, 23, 34, 41, 50 |
| 3 | Scandic Oulu | Public bus lines: 1, 2, 7, 10, 20, 23, 34, 41, 50 |
| 4 | Lapland Hotels Oulu | Public bus lines: 1, 2, 7, 10, 20, 23, 34, 41, 50 |
| 5 | Cumulus City Oulu | Public bus lines: 1, 2, 7, 10, 20, 23, 34, 41, 50 |
| 6 | Original Sokos Hotel Arina Oulu | Public bus lines: 1, 2, 7, 10, 20, 23, 34, 41, 50 |
| 7 | Best Western Hotel Apollo | Public bus lines: 1, 2, 7, 10, 20, 23, 34, 41, 50 |

From Airport to City Center

- Public transportation:
- Bus lines 8 (27 min) and 9 (35 min)
 - Tickets are available from the bus driver and cost € 5.8
- Taxi:
- The price for a taxi ride from the airport to the city center is about € 35

■ Local Organizing Committee

| | | |
|-------------|------------------------------------|--|
| Chair: | Petri Lehenkari, Prof., Ph.D., MD | University of Oulu |
| Vice-Chair: | Miho Nakamura, Ph.D. | Tokyo Medical and Dental University, University of Oulu |
| | Juha Tuukkanen, Prof., Ph.D. | University of Oulu |
| | Juhana Leppilahti, Prof., Ph.D, MD | University of Oulu Hospital |
| | Sanna Turunen, Ph.D. | University of Oulu |
| | Mikko Finnilä, Ph.D. | University of Oulu |
| | Timo Alalääkkölä | University of Oulu Hospital |
| | Salla Hirvonen | Business Oulu |

■ Japanese Advisory Committee

| | | |
|--------|------------------------------|-------------------------------------|
| Chair: | Masaya Yamamoto, Prof., Ph.D | Tohoku University |
| | Yuriko Higuchi, Ph.D. | University of Kyoto |
| | Satoshi Uchida, Ph.D. | The University of Tokyo |
| | Kenichi Nagase, Ph.D. | Keio University |
| | Tsuyoshi Kimura, Ph.D. | Tokyo Medical and Dental University |
| | Hiroyasu Takemoto, Ph.D. | Tokyo Institute of Technology |
| | Yukiko Matsunaga, Ph.D. | The University of Tokyo |
| | Takako Uchida | BusinessOulu |

■ Topics

Regenerative medicine

Drug Delivery system

Tissue and Cell engineering

Clinical application of biomaterials and medical implants

MEMS

Industrialization of research achievements

■ Plenary speakers

Prof. Takao Hanawa (Tokyo Medical and Dental University)

Prof. Tatsuya Shimizu (Tokyo Women's Medical University)

■ Schedule at a glance

| | | |
|------|-----|--|
| 17.6 | Sun | Welcome reception |
| 18.6 | Mon | Seminar |
| 19.6 | Tue | Seminar & Banquet |
| 20.6 | Wed | Seminar & OuluHealth Lab visit (http://ouluhealth.fi/labs/) |
| 21.6 | Thu | Meeting for research matching towards collaboration |

■ Presentations

| | Presentation | Questions and answers |
|----------------------|--------------|-----------------------|
| Plenary presentation | 40 minutes | 5 minutes |
| Invited presentation | 20 minutes | 5 minutes |
| Oral presentation | 15 minutes | 5 minutes |

In order to ensure the smooth running of the presentations, speakers are advised the following:

- Speakers are requested to be in the “next speaker chair” at least 10 min before the start of the presentation.
- The chairperson will monitor your presentation timekeeping.
- Speakers will be provided with a microphone and a laser pointer for use in their presentations.
- Please check all your videos run properly with the support team before your presentation.
- All presentations need to be sent to the organizers through FileSender link by 11th of June 2018. The link will be sent to the speakers by email to the address they have given when registering to the meeting.
- A computer and projector will be provided
- Use of individual laptop computers is NOT permitted

For poster presentations the please note following:

- The maximum size of the poster is 100 cm x 120 cm (vertical)
- Please put your poster on the stand already on Monday 18th June, the official poster session is from 12:00-12:55 on Tuesday when all presenters are expected to be available at their posters.
- Poster stands and needles for attachment are provided
- Please find your poster stand by the number of your poster in the program

■ **Social programs**

Welcome reception (Finnish culture experience)

Date and Time: 17.6 (Sun) 18:00-21:00

Location: Maikkula Mation (Maikkulanrinne 21, 90240 Oulu)

Please bring your swimsuit and towel.

Banquet (City Reception):

Date and Time: 19.6 (Tue) 19:00-20:30

Location: City Hall (Kirkkokatu 2a, 90100 Oulu)

Dress code: Business casual

■ **Free WiFi: Panoulu** in university and city center



JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE

日本学術振興会



ACADEMY OF FINLAND

Health and Bioscience Doctoral Program, University of Oulu

**Finland-Japan Workshop:
The next generation medical engineering in biomaterials
Program**

Program on 17 June (Sunday)

Transportation to Welcome Reception

- 17:20 from Sokos Hotel Eden
17:30 through City Hall
18:00–21:00 Welcome reception, Maikkula Mantion
Please bring your swimsuit and towel.

Program on 18 June (Monday)

- 8:00–8:15 Opening remarks
Petri Lehenkari, *University of Oulu*, Chair of local organizing committee
Masaya Yamamoto, *Tohoku University*, Chair of Japanese Advisory Committee
8:15–8:25 **Tadaharu Tsumoto**, *JSPS Stockholm Office in Sweden*
8:25–8:35 **Ulla Ellmén**, *Academy of Finland*
8:35–8:45 **Ritva Saastamoinen and Mirja Peltola**,
Health and Bioscience Doctoral Program, University of Oulu

Session 1. Clinical problem of implants

Chairs: **Takao Hanawa**, *Tokyo Medical and Dental University*
Petri Lehenkari, *University of Oulu*

- 1-1. 8:45–9:10 **Juhana Leppilähti**, *Oulu University Hospital*
Biomaterials in hip and knee arthroplasties
1-2. 9:10–9:35 **Aleksi Reito**, *Central Finland Hospital and Coxa Hospital for Joint Replacement*
Metal-on-metal hip replacements: lessons learned from the world wide catastrophe
1-3. 9:35–10:00 **Jaakko Niinimäki**, *University of Oulu*
Clinical imaging of medical implants – a review

10:00–10:20 Coffee break

- 1-4. 10:20–10:45 **Sami Tetri**, *Department of Neurosurgery, Oulu University Hospital*
Complications of artificial skull implants
- 1-5. 10:45–11:10 **Fredrik Yannopoulos**, *Cardiothoracic Surgery Unit, Oulu University Hospital*
Clinical applications and problems of implanted biomaterials in cardiothoracic surgery
- 1-6. 11:10–11:35 **Arjaleena Ilo**, *Vascular Surgery Unit, Oulu University Hospital*
Biomaterials in vascular surgery

11:35–12:35 Lunch on your own

Session 2. Clinical application of biomaterials and medical implants

Chairs: **Tatsuya Goda**, *Tokyo Medical and Dental University*

Juhana Leppilahti, *University of Oulu*

- 2-1. 12:35–13:20 **Plenary lecture**
Takao Hanawa, *Tokyo Medical and Dental University*
Next Generation Metallic Implant Materials and Surfaces
- 2-2. 13:20–13:45 **Masato Ueda**, *Kansai University*
2D Patterning of Cells by Light Irradiation
- 2-3. 13:45–14:05 **Yusuke Tsutsumi**, *Tokyo Medical and Dental University*
Long-term corrosion monitoring of metallic biomaterials

14:05–14:25 Coffee break

Session 3. Delivery systems

Chairs: **Kenichi Nagase**, *Keio University*

Juha Tuukkanen, *University of Oulu*

- 3-1. 14:25–14:45 **Heikki Nieminen**, *Aalto University*
Novel concepts of ultrasonic drug delivery
- 3-2. 14:45–15:10 **Akihisa Otaka**, *Kansai University*
Bone-targeting phospholipid polymer to solubilize lipophilic anticancer drug
- 3-3. 15:10–15:30 **Mitsuru Naito**, *The University of Tokyo*
Intracellular-ATP-responsive siRNA delivery systems

- 3-4. 15:30–15:50 **Simo Näkki**, *University of Eastern Finland*
Designed porous nanovector for safe and effective cancer therapy
- 3-5. 15:50–16:10 **Satoshi Uchida**, *The University of Tokyo*
Therapeutic application of mRNA delivery using polyplex micelles
- 3-6. 16:10–16:30 **Yuriko Higuchi**, *Kyoto University*
Improvement cell-cell adhesion by cell surface modification with ligand molecule via PEG-lipid

Program on 19 June (Tuesday)

Session 4. Tissue and cell engineering

Chairs: **Masaya Yamamoto**, *Tohoku University*

Petri Lehenkari, *University of Oulu*

- 4-1. 8:00–8:45 **Plenary lecture**
Tatsuya Shimizu, *Tokyo Women's Medical University*
Thick Tissue Fabrication using Vascularization Technology
- 4-2. 8:45–9:10 **Saara Laitinen**, *Finnish Red Cross*
Nanotechnology in wound treatment
- 4-3. 9:10–9:30 **Tsuyoshi Kimura**, *Tokyo Medical and Dental University*
Development of an antibody immobilizing device for label-free selective capture of target cells
- 4-4. 9:30–9:50 **Jun Kobayashi**, *Tokyo Women's Medical University*
Temperature-dependent affinity of heparin-binding growth factors and cells with a heparin-immobilized thermoresponsive surface
- 9:50–10:10 Coffee break

Chairs: **Yuriko Higuchi**, *Kyoto University*

Saara Laitinen, *Finnish Red Cross*

- 4-5. 10:10–10:35 **Osamu Suzuki**, *Tohoku University*
Chemical behavior and bioactive property of octacalcium phosphate-based bone substitute materials

- 4-6. 10:35–10:55 **Nobuyuki Tanaka**, *RIKEN*
Cell differentiation and surface properties toward label-free non-destructive cell quality assessment
- 4-7. 10:55–11:15 **Hiroyasu Takemoto**, *Tokyo Institute of Technology*
Development of polyzwitterion that recognizes tumorous pH for effective delivery of the coated nanoparticles
- 4-8. 11:15–11:35 **Masaya Yamamoto**, *Tohoku University*
Development of a sacrificial template with a stimulus-responsive biomaterial to fabricate a vascularized soft microfluidic device
- 11:35–12:55 Lunch buffet and Poster session

Session 5. Biomaterials for regenerative medicine

Chairs: **June Kobayashi**, *Tokyo Women's Medical University*

Jukka Seppälä, *Aalto University*

- 5-1. 12:55–13:20 **Akio Kishida**, *Tokyo Medical and Dental University*
Topological study of basement membrane of decellularized aorta using its synthetic replica
- 5-2. 13:20–13:45 **Mikael Skrifvars**, *University of Borås*
Added value of functionalised structural textiles as biomaterials
- 5-3. 13:45–14:10 **Michael Gasik**, *Aalto University Foundation*
Mechanobiology and implants: from bench to bed, and back?
- 5-4. 14:10–14:30 **Kenichi Nagase**, *Keio University*
Temperature-Modulated Cell Separation Methods for Regenerative Medicine
- 14:30–14:50 Coffee break

Chairs: **Satoshi Uchida**, *The University of Tokyo*

Mikael Skrifvars, *University of Borås*

- 5-5. 14:50–15:15 **Hannu Aro**, *University of Turku, Turku University Hospital*
Development of bioactive glass as synthetic bone substitute
- 5-6. 15:15–15:40 **Jukka Seppälä**, *Aalto University*
3D-Printed Bio-Polymeric Scaffolds for Tissue Regeneration and Nerve Guiding

- 5-7. 15:40–16:00 **Ashok Kumar**, *Indian Institute of Technology Kanpur*
Biomimetic and Bioinspired Scaffolds and Biomaterials for Bone and Nerve Tissue Engineering and Regenerative Medicine
- 5-8. 16:00–16:20 **Miho Nakamura**, *University of Oulu/Tokyo Medical and Dental University*
Banked bone intended for clinical use contains stored piezoelectrical energy
- 18:30 Transportation to Banquet (City reception) for those who are accommodated in hotel Eden)
- 19:00–20:30 **Banquet (City reception)**, City Hall

Program on 20 June (Wednesday)

Session 6. New techniques and biomaterials

Chairs: **Tsuyoshi Kimura**, *Tokyo Medical and Dental University*

Michael Gasik, *Aalto University*

- 6-1. 8:00–8:25 **Takayuki Narushima**, *Tohoku University*
Antibacterial activity of TiO₂ layers formed on Ti-Au alloys by thermal oxidation
- 6-2. 8:25–8:50 **Marko Huttula**, *University of Oulu*
Synchrotron based soft X-ray spectromicroscopy for bio and medical materials characterization
- 6-3. 8:50–9:10 **Mikko Finnilä**, *University of Oulu*
Contrast enhanced micro-computed tomography imaging of joint degeneration in osteoarthritis rat models
- 6-4. 9:10–9:30 **Tatsuro Goda**, *Tokyo Medical and Dental University*
Sugar-incorporated Conducting Polymers for Influenza Virus Diagnosis
- 9:30–9:50 Coffee break

Session 7. Industrialization

Chairs: **Miho Nakamura**, *University of Oulu/Tokyo Medical and Dental University*

Mikko Finnilä, *University of Oulu*

- 7-1. 9:50–10:15 **Masanori Kikuchi**, *National Institute for Materials Science*
Hydroxyapatite/Collagen Bone-Like Nanocomposite: Novel Applications

- 7-2. 10:15–10:35 **Maritta Perälä-Heape**, *University of Oulu*
OuluHealth innovation ecosystem
- 7-3. 10:35–10:50 **Timo Alaläykkölä**, *Oulu University Hospital*
OuluHealth Labs - a top class testing environment for health technology solutions
- 7-4. 10:50–11:05 **Jukka Kortelainen**, *University of Oulu, Cerenion Oy*
Cerenion Oy - From research idea to start-up
- 7-5. 11:05–11:20 **Hanna Tölli**, *BBS-Bioactive Bone Substitutes Oyj*
ARTEBONE®-Next Generation Bone Substitute
- 7-6. 11:20–11:35 **Goncalo Barreto**, *Disior Analytics*
Treatment design tools for orthopaedic surgery
- 7-7. 11:35–11:50 **Virpi Muhonen**, *Askel Healthcare Ltd*
From cartilage regeneration researcher to an entrepreneur in a medical device start-up: the COPLA Scaffold case
- 7-8. 11:50–12:05 **Jerome Thevenot**, *MIPT*
From research to clinics: detection of joint disorders with MAKNEE
- 12:05–13:30 Lunch on your own
- 13:30 Guided walk to OYS TestLab starting in front of Leena Palotie Hall
(Auditorium 101A, Aapistie 5 A)
- 13:40–15:40 Visiting OYS Test Lab, on-site presentations and discussion

Program on 21 June (Thursday)

Meeting for research matching towards collaboration (For participants who wish to collaborate)

Chairs: **Yuriko Higuchi**, *Kyoto University* (mail to: higuchi@pharm.kyoto-u.ac.jp)

Hiroyasu Takemoto, *Tokyo Institute of Technology*

Time 9:00- 10:30

Location: Medical Campus, Aapistie 5 A, seminar room 116B

Poster presentations

- P1** Inari Avila, *University of Oulu*
Adhesion and mechanical properties of nanocrystalline hydroxyapatite coating obtained by onversion of atomic layer deposited calcium carbonate on titanium substrate
- P2** Shuvashis Das Gupta, *University of Oulu*
Raman Micro-spectroscopic analysis of the mineral/matrix ratios in both Subchondral Bone Tissue and Calcified cartilage in human osteochondral samples
- P3** Shekh Emran, *University of Eastern Finland*
Concentric ring probe for bioimpedance spectroscopic measurements: design and ex vivo feasibility testing on pork jaw tissues
- P4** Shaimaa Fouda, *College of Dentistry, Imam Abdulrahman Bin Faisal University*
Effect of Nanodiamonds on Candida albicans Adhesion to PMMA denture base: An in vitro study
- P5** Matti Huotari, *University of Oulu*
Photoplethysmography based arterial oxygen saturation estimation
- P6** Remi Kamakura, *University of Oulu*
Controlled delivery system for nutritional compounds to stimulate gastrointestinal hormone secretion in vitro
- P7** Asla Keisu, *University of Oulu*
The association between knee breadth and body mass
- P8** Juuso Ketola, *University of Oulu*
Structural bone analysis with limited data
- P9** Sumanta Samanta, *Tampere University of Technology*
Engineering extra cellular matrix mimetic conductive scaffold for cardiac tissue regeneration
- P10** Khalil Shahramian, *University of Turku*
Thrombogenicity of sol-gel derived TiO₂ coated zirconia
- P11** Prateek Singh, *University of Oulu*
Biomimetic surfaces for matrix-matched cell biology
- P12** Nazanin Zanzanizadeh Ezazi, *University of Helsinki*
Conductive vancomycin-loaded porous silica bone scaffolds