MHS2014

2014 International Symposium on Micro-NanoMechatronics and Human Science
(From Micro & Nano Scale Systems to Robotics & Mechatronics Systems)
Symposium on “Hyper Bio Assembler for 3D Cellular System Innovation”
Grant-in-Aid for Scientific Research on Innovative Areas, MEXT, Japan
Nov. 9 - 12, 2014, Nagoya, Japan

November 9 (Sun)
Location: Noyori Conference Hall

23nd International Micro Robot Maze Contest 2014
Categories:
- Category 0: Micro Robot Racer
- Category 1: Teleoperated Micro Robot Maze Competition
- Category 2a: Fully Autonomous Micro Robot Maze Competition
- Category 2b: Remote-Controlled Micro Robot Maze Competition
- Category 3a: Biped Micro Robot Competition
- Category 3b: Multiple Legged Micro Robot Competition
- Category 4: Micro Robot Performance

Time Schedule:
09:30 Opening Ceremony
09:45 Category 0: Micro Robot Racer
11:30 Category 2a: Fully Autonomous Micro Robot Maze Competition
12:00 Category 3a: Biped Micro Robot Competition
12:20 Lunch Break
13:00 Category 4: Micro Robot Performance
13:15 Category 1: Teleoperated Micro Robot Maze Competition
14:15 Category 2b: Remote-Controlled Micro Robot Maze Competition
15:25 Category 3b: Multiple Legged Micro Robot Competition
16:00 Break
16:30 Award Ceremony and Closing
November 10 (Mon)  
Location: Noyori Conference Hall

**Opening Remarks**
Chairperson: *Fumihito Arai, Nagoya University*

09:00-9:20  
*Prof. Toshio Fukuda, Meijo University, Nagoya University, Japan, Beijing Institute of Technology, China*  
*Prof. Tatsuo Arai, Osaka University, Japan*

**Plenary Talk**
Chairperson: *Prof. Takehisa Matsuda, Professor Emeritus, Kyushu University*

09:20-10:10  
Plenary Talk 1  
Regenerative Medicine from the Viewpoint of Materials Science  
- Regenerative Research and Therapy -  
*Prof. Yasuhiko Tabata, Department of Biomaterials, Institute for Frontier Medical Sciences, Kyoto University, Japan*

10:10-10:20  
**Coffee Break**
Chairperson: *Makoto Nakamura, Toyama University*

10:20-11:10  
Plenary Talk 2  
Bio-3D Printing: Challenges and Opportunities  
*Prof. Wei Sun, Albert Soffa Chair Professor; Drexel University, USA*  
*1000plan Chair Professor and Director, Biomanufacturing Engineering Research Institute, Tsinghua University, Beijing, China*

Chairperson: *Yasuhisa Hasegawa, Nagoya University*

11:10-12:00  
Plenary Talk 3  
Biologically Inspired Approach Towards Implementation of Bionic Arm  
*Prof. Sang-Rok Oh, Korea Institute of Science and Technology, Korea*

12:00-12:50  
**Lunch**
Poster session I

Chairperson: Masahiro Ohka, Nagoya University
Seiichi Hata, Nagoya University
Norikazu Suzuki, Nagoya University

12:50-14:20

MP-1 Development and Evaluation of a Wheelchair Lifter for Automobile Use
Kazuto Miyawaki and Toshimi Sato, Akita National College of Technology, Japan

MP-2 Task Descriptions and a Program Execution for Framework for an Autonomous Robot
Yoshitatsu Suzuki, Kengo Emoto, Ryota Kato, Ryoji Tanaka, Eiichiro Tani, Hidekazu, Yamada and Kyoichi Tatsuno, Meijo University, Japan

MP-3 Work Environments Construction for an Autonomous Robot
Kengo Emoto, Yoshitatsu Suzuki, Ryota Kato, Ryoji Tanaka, Hidekazu Yamada, Eiichiro Tani and Kyoichi Tatsuno, Meijo University, Japan

MP-4 Navigation Control for an Exploration Rover with Microwave Doppler Sensors (Fabrication of Third Prototype Rover and Experiments)
Masahiro Isogai Yasuhiko Nawa and Toru Iijima, Aichi University of Technology, Japan

MP-5 Estimation of Vibration Stimulus Threshold for Inducing Kinesthetic Illusion
Masakazu Honda, Hiroyuki Karakawa, Koichi Akahori, Tetsu Miyaoka and Masahiro Ohka, Industrial Research Institute of Shizuoka Prefecture, Japan

MP-6 Auto-selection of Optimal Visual Representation for a Flying Robot based on Altitude Control
Shohei Suzuki and Kosuke Sekiyama, Nagoya University, Japan

MP-7 Design Concept of a New Bio-inspired Tactile Sensor Based on Main Pulvinus Motor Organ Cells Distribution of Mimosa Pudica Plant
Siti Nora Basir, Hanafiah Yussof, Nur Ismarrubie Zahari and Fahrulrodzi Idris, Universiti Teknologi MARA, Malaysia

MP-8 Influence of Target-target Distance for Composition Distribution in New Facing Targets Sputtering
Takuya Maetani, Yutaka Nakamitsu, Junpei Sakurai and Seiichi Hata, Nagoya University, Japan
MP-9 Observation of the Permeation on the Subcutaneous during the Administration of Drug and Development of a Needle
   Kento Kawata, Kazuyoshi Tsuchiya, Kagemasa Kajiwara and Minoru Kimura, Nagoya University, Japan

MP-10 Selection of the Best Shape for A Micro Painless Needle
   Hideaki Kimoto, Takehiko Inoue, Kazuyoshi Tsuchiya, Kagemasa Kajiwara, Minoru Kimura, Tokai University, Japan

MP-11 One Double-stranded DNA Probes as Classifier of Multi Targeting Strand
   Wibowo Adi and Kosuke Sekiyama, Nagoya University, Japan

MP-12 Levitation Energy of Piezoelectric Actuator using a Levitation Mechanism
   Shori Sone, Akihiro Torii, Kae Doki and Suguru Mototani, Aichi Institute of Technology, Japan

MP-13 A DC Voltage Estimation at the Maximum Power Point of a Series Parallel Connection PV System with Partial Shade
   Jun Ishikawa, Atsushi Nakata, Akihiro Torii, Kae Doki and Suguru Mototani, Aichi Institute of Technology, Japan

MP-14 Multi Geometrical Image Processing Based on Active Vision Agent
   Sukarnur Che Abdullah, Masahiro Ohka, Jamaluddin Mahmud, M. Azzeim M., Jusoh and Juri Saedon, Universiti Teknologi MARA, Malaysia

MP-15 Single Particle Tracking Study on Diffusion Process in a Polymer Matrix
   Yu Matsuda, Ryo Iwao, Hiroki Yamaguchi, and Tomohide Niimi, Nagoya University, Japan

MP-16 Robust Packaging of QCR Load Sensor for Biosignal Detection
   Yuichi Murozaki, Shinya Sakuma and Fumihito Arai, Nagoya University, Japan

MP-17 Shape Optimization of Neck Myoelectric Signal Control-type Speaking Valve
   Katsutoshi Oe and Kohei Sakurai, Daiichi Institute of Technology, Japan

MP-18 Open Microfluidic Chip using Air-liquid Interface for Single Cell Isolation and Aspiration
   Song Woneui, Taisuke Masuda, Hayao Nakanishi and Fumihito Arai, Nagoya University, Japan

MP-19 Optically Controllable Muscle for Cell-based Microdevice
   Toshifumi Asano, Toru Ishizuka, Hiromu Yawo and Keisuke Morishima, Osaka University, Japan
MP-20  Fall Detection for Elderly by using an Intelligent Cane Robot based on Center of Pressure (COP) Stability Theory
Pei Di, Jian Huang, Shotaro Nakagawa, Kosuke Sekiyama and Toshio Fukuda,
Nagoya University, Japan

MP-21  Understanding of Human Tactile Mechanism in comparing Material Properties through the Analysis of Displacement on Foil Surface
Mohammad Azzeim Mat Jusoh, Masahiro Ohka, Yu Chun Wang and Tetsu Miyaoka,
Nagoya University, Japan

14:20-14:25  Coffee Break
Silver Jubilee Special Talk

Chairperson: Osamu Suzuki, Tohoku University

14:25-14:55 Silver Jubilee Special Talk
Engineered Biointerfaces for the Control of Cell Adhesion and Bioanalytical Devices
Prof. Jürgen Rühe, Laboratory for Chemistry and Physics of Interfaces, Department of Microsystems Engineering (IMTEK), University of Freiburg, Germany

Session MPI-1: (Organized Session) : Functional Interfaces in Micro-nanofluidics

Conference Room 1

Chairperson: Yoko Yamanishi, Shibaura Institute of Technology
Shingo Nakamura, Shibaura Institute of Technology

15:05-15:20 Development of a Lightweight Manipulator with Constraint Mechanism
Daichi Matsuoka, Guillermo Enriquez, Huei Ee Yap and Shuji Hashimoto, Waseda University, Japan

15:20-15:35 Design of Electrostatic Adhesion Device using the Flexible Electrodes
Akifumi Takada, Shingo Nakamura, Yoko Yamanishi, Shinji Hashimura, Sumito Nagasawa, Takanobu Kogure and Shingo Maeda, Shibaura Institute of Technology, Japan

Hirotaka Hida, Katsuya Ozoe, Isaku Kanno, Tetsuya Higashiyama and Michitaka Notaguchi, Kobe University, Japan

15:50-16:05 Minimally-invasive Local Injection by Electrically-driven Narrow Orifice Channel
Kazuki Takahashi, Shun Omi and Yoko Yamanishi, Shibaura Institute of Technology, Japan

16:05-16:20 Experimental Study on Dielectric Properties of Yeast Cells in Micro Channel by Impedance Spectroscopy
Jiafeng Yao, Tatsuya Kodera, Achyut Sapkota, Hiromichi Obara and Masahiro Takei, Chiba University, Japan

16:20-16:35 A Simple Ion Concentration Measurement System using a Microfluidic Device with ISFET Sensors
Tsuyoshi Miura and Akira Yamada, Aichi Institute of Technology, Japan
**Session MP2-1: (Organized Session) : Robot System Control and Its Software**

**Conference Room 2**

**Chairperson:** Kenichi Ohara, Meijo University  
Tomohito Takubo, Osaka City University

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:05-15:20</td>
<td>Precise Time Synchronization Device for Distributed Robot System Cooperation</td>
<td>Kenichi Ohara, Meijo University, Japan</td>
</tr>
<tr>
<td>15:20-15:35</td>
<td>3D Movement of Legged Robot in Narrow Space</td>
<td>Takeshi Toda, Kenichi Ohara, Kazuto Kamiyama, Masaru Kojima, Mitsuhiro Horade, Yasushi Mae and Tatsuo Arai, Osaka University, Japan</td>
</tr>
<tr>
<td>15:35-15:50</td>
<td>Development of Simplified Haptic Interface for Two-finger Micro-manipulator</td>
<td>Kazuto Kamiyama, Masaru Kojima, Mitsuhiro Horade, Yasushi Mae and Tatsuo Arai, Osaka University, Japan</td>
</tr>
<tr>
<td>15:50-16:05</td>
<td>3D Gait Planning Based on Discrete-time Kinematic Model of Biped Walking</td>
<td>Daiki Kobayashi, Tomohito Takubo and Atsushi Ueno, Osaka City University, Japan</td>
</tr>
<tr>
<td>16:05-16:20</td>
<td>Camera View Centered Mobile Robot Control Interface</td>
<td>Naoto Hirakawa, Tomohito Takubo and Atsushi Ueno, Osaka City University, Japan</td>
</tr>
<tr>
<td>16:35-16:45</td>
<td><strong>Coffee Break</strong></td>
<td></td>
</tr>
</tbody>
</table>
Session MP1-2: (Organized Session) : Young Researchers in Biomedical Engineering
Conference Room 1

Chairperson: Taisuke Masuda, Nagoya University
Kazuyoshi Tsuchiya, Tokai University

16:45-17:00 Evaluation of Enzyme Immobilization Methods on Microglucose Sensors
Integrated to a Microfluidic Device
Ryo Yazaki, Sho Shimasaki, Kazuyoshi Tsuchiya, Teruo Fujii and
Hiroshi Kimura, Tokai University, Japan

17:00-17:15 Pinpoint Chemical Stimulation at a Single-cell Scale by Microfluidic
Technology
Masayuki Horayama, Tomoki Ohkubo, Kenta Arai, Kazuya Kabayama,
Teruo Fujii and Hiroshi Kimura, Tokai University, Japan

17:15-17:30 Single-cell Picking by Integrated Micropipette having Sensor for Passage
Detection of Cell
Kazuya Tashiro, Taisuke Masuda and Fumihito Arai, Nagoya University, Japan

17:30-17:45 Comparison and Implementation of Motion Detection Methods for Sperm
Detection and Tracking
A. Nurhadiyatna, A.L. Latifah, D. Fryantoni, T. Wirahman, R. Wijayanti,
and F.H. Muttaqien
Research Center for Informatics, Indonesian Institute of Sciences (LIPI),
Indonesia

17:45-18:00 A Computer Simulation of Reconstitute Systems of Motor Proteins
Revealed Biophysical Phenomena Relevant to Biomedical Engineering
Takahiro Nitta and Yuki Ishigure, Gifu University, Japan
### Session MP2-2 Robotics and Mechatronics-1

**Conference Room 2**

**Chairperson:** Kosuke Sekiyama, Nagoya University  
Syamimi Shamsuddin, Universiti Teknologi MARA

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:45-17:00</td>
<td>Muscle Biopsy System for Extracting Fibrous Muscular Tissue</td>
<td>Akari Ushida and Makoto Nokata, Ritsumeikan University, Japan</td>
</tr>
<tr>
<td>17:00-17:15</td>
<td>Light Driven SMA Actuator using Optical Waveguide Made of Past Type</td>
<td>Keita Usaki, Yuichi Ashida, Takefumi Kanda, Koichi Suzumori and Shuichi Wakimoto, Okayama University, Japan</td>
</tr>
<tr>
<td></td>
<td>Organic Material</td>
<td></td>
</tr>
<tr>
<td>17:15-17:30</td>
<td>DNA-based Swarm Intelligence Inspired Computation</td>
<td>Rizki Mardian and Kosuke Sekiyama, Nagoya University, Japan</td>
</tr>
<tr>
<td>17:30-17:45</td>
<td>Humanoid Robot Nao as a Teaching Tool of Emotion Recognition for</td>
<td>Mohd Azfar Miskam, Syamimi Shamsuddin, Mohd Ridzuan Abdul Samat, Hanafiah Yussof, Husna Ahmad Ainudin and Abdul Rahman Omar, Universiti Teknologi MARA, Malaysia</td>
</tr>
<tr>
<td></td>
<td>Children with Autism using the Android App</td>
<td></td>
</tr>
<tr>
<td>17:45-18:00</td>
<td>Support of COG Trajectory Tracking by Arm-swing with Bipedal Walking</td>
<td>Taisuke Kobayashi, Kosuke Sekiyama, Tadayoshi Aoyama, Yasuhisa Hasegawa and Toshio Fukuda, Nagoya University, Japan</td>
</tr>
</tbody>
</table>
Technical Sessions

Session TA1-1: (Organized Session) : Bio-Assembler -1

Conference Room 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00-09:15</td>
<td>Microassembly of Spheroids by Thermoresponsive Gel Probe</td>
<td>Masaru Takeuchi, Masahiro Nakajima, Toshio Fukuda and Yasuhisa Hasegawa, Nagoya University, Japan</td>
</tr>
<tr>
<td>09:15-09:30</td>
<td>Assembly of the Hybrid Multicellular Spheroids using Epithelial Cells and Hydrogel Beads</td>
<td>Wakako Motoyama, Shigehisa Aoki and Nobuhiko Kojima, Yokohama City University, Japan</td>
</tr>
<tr>
<td>09:30-09:45</td>
<td>Circulatory Culture System for Elastic Fiber Development of Tissue-engineered Blood Vessels</td>
<td>Yuka Yamagishi, Taisuke Masuda, Mitsuhiro Ukiki, Michiya Matsusaki, Mitsuru Akashi, Utako Yokoyama and Fumihito Arai, Nagoya University, Japan</td>
</tr>
<tr>
<td>09:45-10:00</td>
<td>Chick Embryo Cultured in a Cubic Eggshell as a Promising Animal Model</td>
<td>Wenjing Huang, Fumihito Arai, and Tomohiro Kawahara, Kyushu Institute of Technology, Japan</td>
</tr>
<tr>
<td>10:00-10:15</td>
<td>Construction of Cell Sheet-based 3D Tissues with Designed Cell Orientation using Anisotropic Cell Sheets</td>
<td>Hironobu Takahashi, Tatsuya Shimizu, Masamichi Nakayama, Masayuki Yamato and Teruo Okano, Tokyo Women’s Medical University, Japan</td>
</tr>
<tr>
<td>10:15-10:30</td>
<td>In Vitro Assessment of Osteoblastic Differentiation of Encapsulated Stromal Cells in Alginate/Octacalcium Phosphate</td>
<td>Kosei Endo, Takahisa Anada, Masumi Yamada, Minoru Seki, Keiichi Sasaki and Osamu Suzuki, Tohoku University, Japan</td>
</tr>
</tbody>
</table>
Session TA2-1: (Organized Session) : Bio-manipulation and Its Applications

Conference Room 2

Chairperson:  Masahiro Nakajima, Nagoya University
              Tomohiro Kawahara, Kyushu Institute of Technology

09:00-09:15  On-line Tracking and Stimulation of Swimming Microorganism by
            On-Chip Microrobot
            Belal Ahmad, Tomohiro Kawahara, Takashi Yasuda and Fumihito Arai,
            Kyushu Institute of Technology, Japan

09:15-09:30  Directly Measurement of Shear Force of a Single Adhesion Cell using a
            Self-sensitive Cantilever
            Shigetaka Hashimoto, Makoto Adachi and Futoshi Iwata, Shizuoka
            University, Japan

09:30-09:45  High Performance Cell Membrane Perforation System for Cell
            Suspensions
            Takaaki Mori, Yukihiro Akiyama, Shogo Unuma and Takashi K. Saito,
            Akita Prefectural University, Japan

09:45-10:00  Development of a Single Cell Electroporation Method using a Scanning
            Ion Conductance Microscope with a Theta Type Probe Pipette
            Satoshi Sakura, Koji Yamazaki, Tatsuo Usiki and Futoshi Iwata,
            Shizuoka University, Japan

10:00-10:15  On-chip Cell Manipulation by Vibration-induced Whirling Flow
            Takeshi Hayakawa, Shinya Sakuma and Fumihito Arai,
            Nagoya University, Japan

10:15-10:30  Surface-tension Microscopy by Noncontact Meniscus-manipulation
            Nobuyuki Tanaka, Makoto Kondo, Hiroaki Sugiyama, Masayuki Yamato,
            Teruo Okano and Jun Miyake, Osaka University

10:30-10:40  Coffee Break
Session TA1-2: (Organized Session) :Bio-Assembler -2

Conference Room 1

Chairperson: Masumi Yamada, Chiba University
Shinji Sugiura, AIST

10:40-10:55 Automated Construction System for Fine Lattice Shape Structures Based on Alginate Gel Fiber
Akira Fukushima, Masaru Kojima, Kenichi Ohara, Mitsuhiro Horade, Kazuto Kamiyama, Yasushi Mae and Tatsuo Arai, Osaka University, Japan

10:55-11:10 Shape Control of Cell-embedding Hydrogel Microstructures Utilizing Non-equilibrium Aqueous Two-phase Systems
Natsuki Nakaijma, Kenta Yamakoshi, Yuya Yajima, Masumi Yamada and Minoru Seki, Chiba University, Japan

11:10-11:25 Nano-scale Physical Surface Coating of Temperature-responsive Polymers for Cell Sheet Fabrications
Masamichi Nakayama, Yurika Kimura, Hideko Kanazawa, Masayuki Yamato and Teruo Okano, Tokyo Women’s Medical University, Japan

11:25-11:40 Real-time Local Environmental Stimulation System with Visual Feedback Control
Takahiro Motoyoshi, Masaru Kojima, Kenichi Ohara, Mitsuhiro Horade, Kazuto Kamiyama, Yasushi Mae and Tatsuo Arai, Osaka University, Japan

11:40-11:55 Microscale Cell Manipulation by using Photodegradable Hydrogel
Shinji Sugiura, Fumiki Yanagawa, Toshiyuki Takagi, Kimio Sumaru, Toshiyuki Kanamori, Masato Tamura and Hirofumi Matsui, AIST, Japan
Session TA2-2: (Organized Session) : Community-Centric Robotics

ConferenceRoom 2

Chairperson: Janos Botzheim, Tokyo Metropolitan University
Naoyuki Kubota, Tokyo Metropolitan University

Masashi Sugimoto and Kentarou Kurashige, Muroran Institute of Technology, Japan

10:55-11:10 Development of Remote Controllable Visiting Robot Considering Local Situation
Shota Mitsumura, Yoshinobu Akimoto, Eri Sato-Shimokawara and Toru Yamaguchi, Tokyo Metropolitan University, Japan

11:10-11:25 Acquisition of the Human Characteristics through Dialogue with a Robot at Home
Tetsuya Kaneko, Reona Gomi, Eri Sato-Shimokawara, and Toru Yamaguchi, Tokyo Metropolitan University, Japan

11:25-11:40 Exercise Support System with Robot Partner based on Feeling of Self-efficacy
Saika Ono, Junya Kusaka, Takenori Obo and Naoyuki Kubota, Tokyo Metropolitan University, Japan

11:40-11:55 Facial and Gestural Expression Generation for Robot Partners
Jinseok Woo, Janos Botzheim and Naoyuki Kubota, Tokyo Metropolitan University, Japan

11:55-12:55 Lunch
**Poster session II**

**Poster Area (1st floor)**

**Chairperson**
Masahiro Ohka, Nagoya University  
Masumi Yamada, Chiba University  
Osamu Suzuki, Tohoku University

12:55-14:25

**TP-01** Two-axis Scanning Micro Mirror Device with Thick Film Metallic Glass Cu-Zr-Ti and Parylene-C  
Shigetaka Watanabe, Yutaka Nakamitsu, Sakurai Junpei, Mizue Mizojiri and Seiichi Hata, Nagoya University, Japan

**TP-02** SEM-CT Observation of Bone from Mice using Environmental-SEM  
Masahiro Nakajima, Masaru Takeuchi, Taisuke Masuda, Takahisa Anada, Osamu Suzuki, Toshio Fukuda, Qiang Huang and Yasuhisa Hasegawa, Nagoya University, Japan

**TP-03** Control of Cell Orientation in Mesenchymal Cell Sheets Fabricated using Microstructured Mesh Sheet  
Rina Yanaru, Kennedy Omondi Okeyo, Osamu Kurosawa, Hidehiro Oana, Hidetoshi Koteru and Masao Washizu, The University of Tokyo, Japan

**TP-04** Catalytic Driven Micro-nanorobots Fabricated by Direct Laser Writing  
Azrena Abu Bakar, Masahiro Nakajima, Masaru Takeuchi and Toshio Fukuda, Nagoya University, Japan

**TP-05** Design of CuO Anti-reflection Structure for Thin-film Thermoelectric Generator  
Tasuku Kondou, Mizue Mizoshiri and Seiichi Hata, Nagoya University, Japan

**TP-06** Evaluation of Hand Direction for Stroke Patient Based on 3R Under-actuated Robot Manipulator  
Mohd Amiruddin Fikri, Sukarnur Che Abdullah and Mohd Adam Tan, Universiti Teknologi MARA, Malaysia

**TP-07** On-chip Measurement of Mechanical Properties of a Single Cyanobacteria using Direct-outer-drive Mechanism  
Takayuki Hasegawa, Shinya Sakuma and Fumihito Arai, Nagoya University, Japan

**TP-08** Detection of Influenza Virus Subtype using Quartz Crystal Microbalance  
Shuichiro Kagiyama, Taisuke Masuda, Kunihiro Kaihatsu, Nobuo Kato and Fumihito Arai, Nagoya University, Japan
TP-09  Generation of Rotational Flow in Microfluidics Device for Formation of Spheroid
Masaru Kojima, Mitsuhiro Horade, Hirochika Takai, Kenichi Ohara,
Tamio Tamikawa, Kazuto Kamiyama, Yasushi Mae and Tatsuo Arai,
Osaka University Japan

TP-10  Non-contact Measurement of Oxygen Consumption Rate of Single Oocyte using
Stripe-shaped Fluorescence Sensor on Microfluidic Chip
Masanobu Kito, Hisataka Maruyama and Fumihito Arai, Nagoya University, Japan

TP-11  MEMS-based Dispenser Array for Selective Immobilization of Molecular Recognition
Elements on Bio-image Sensor
Moeto Nagai, Satoshi Soga, Tokuma Miyamoto, Takahiro Kawashima and
Takayuki Shibata, Toyohashi University of Technology, Japan

TP-12  Quantitative Image Analyses of Nuclear Dynamics in Migrating Neurons
Hiroki Umeshima, Yuu Kure, Kenichi Nomura, Shuhei Yoshikawa, Shinya Sakuma,
Fumihito Arai, Makoto Kaneko and Mineko Kengaku, Kyoto University, Japan

TP-13  Control of Structure of Multi-channel Collagen Gel Beads
Kazuya Furusawa, Akimasa Fukui and Naoki Sasaki, Hokkaido University, Japan

TP-14  Cell Origami for Cell-sheet Engineering
Fumiaki Tomoike, Yoshikatsu Akiyama, Masayuki Yamato and Shoji Takeuchi,
Tokyo Women’s Medical University, Japan

TP-15  Fabrication of Retinal Microvessel Model using Three-dimensional Membrane
Ippei Kato, Mamoru Mitsuishi, Naohiko Sugita, Kanako Harada, Shinichi Tanaka,
Yasuo Noda, Takashi Ueta and Fumihito Arai, Nagoya University, Japan

TP-16  Secretion of Different Altered Laminin Isoforms Results in Three-dimensional
Morphological Changes in Cells Cultured on Matrigel
Misako Imai, Takeomi Mizutani, Kazushige Kawabata and Hisashi Haga,
Hokkaido University, Japan

TP-17  Efficient Generation of Mature Hepatocyte-like Cells from Human iPSCs
Hinatsu Ohgane, Takanori Takebe, Keisuke Sekine and Hideki Taniguchi,
Yokohama City University, Japan

TP-18  On-chip Fabrication of Bio-degradable Microstructures for 3D Cell Assembly
Ryota Sakakibara, Masaru Takeuchi, Akihiko Ichikawa, Kenichi Ohara,
Masahiro Nakajima, Yasuhisa Hasegawa and Toshio Fukuda, Meijo University, Japan
TP-19  Fabrication of Three Dimensional Hollow or Suspended Microstructures  
Louis Wy Liu, New Education For Life, Hong Kong

TP-20  Electrodeposition of Alginate Hydrogel for Spatially Selective Entrapment of Biological Cells  
Zeyang Liu, Masaru Takeuchi, Masahiro Nakajima, Toshio Fukuda, Yasuhsa Hasegawa and Qiang Huang, Nagoya University, Japan

TP-21  Bubble-based Assembly of Micro-tube with Coordinated Multiple Manipulators  
Ning Yu, Xiaoming Liu, Huaping Wang, Shaoqi Chen, Qing Shi, Qiang Huang and Toshio Fukuda, Beijing Institute of Technology, China

14:25-14:30  Coffee Break

Plenary Talk
Conference Room 1

Chairperson: Makoto Kaneko, Osaka University

14:30-15:10  Plenary Talk 4
Mechanical Basis of Cell Motility Control in the Developing Brain  
Prof. Mineko Kengaku, Kyoto University, Japan

15:10-15:20  Coffee Break
**Session TP1-1: (Organized Session) : Bio-Assembler -3**

**Conference Room 1**

Chairperson: Nobuyuki Tanaka, Osaka University  
Yutaka Ikeda, University of Tsukuba

15:20-15:35 High-throughput Cell-patterning with a Self-assembled Bubble-raft  
Nobuyuki Tanaka, Yuji Haraguchi, Tatsuya Shimizu, Masayuki Yamato,  
Teruo Okano and Jun Miyake, Osaka University, Japan

Ryosuke Takahashi, Kaori Kuribayashi-Shigetomi, Agus Subagyo,  
Kazuhisa Sueoka and Takaharu Okajima, Hokkaido University, Japan

15:50-16:05 Atomic Force Microscopy for Mapping Mechanical Property of the Whole Cell Assembly  
Ryosuke Tanaka, Yuki Fujii, Junpei Kikkawa, Kaori Kuribayashi-Shigetomi,  
Agus Subagyo, Kazuhisa Sueoka and Takaharu Okajima,  
Hokkaido University, Japan

16:05-16:20 Narrowing Slit Device for High Yield One-to-one Electrofusion and Culture of Fusants without Gene Mixing  
S. Sakamoto, K. O. Okeyo, O. Kurosawa, H. Oana, H. Kotera and  
M. Washizu, The University of Tokyo, Japan

16:20-16:35 Cell Pinball  
Ryo Murakami, Makoto Kaneko, Shinya Sakuma and Fumihito Arai,  
Osaka University, Japan

16:35-16:50 Impact of ROS Scavenging Effect on Cell Culture and Bio Assembler  
Yutaka Ikeda, Tomoki Yoshinari and Yukio Nagasaki, University of Tsukuba, Japan
Session TP2-1: (Organized Session): Human Assistive Technologies

Conference Room 2

Chairperson: Yasuhisa Hasegawa, Nagoya University
Yoshihiro Tanaka, Nagoya Institute of Technology

15:20-15:35 Gait Control of Powered Exoskeleton with Finger-mounted Walk Controller for Paraplegic Patient
Yasuhisa Hasegawa and Keisuke Nakayama, Nagoya University, Japan

15:35-15:50 A Wheelchair Operation with an Exoskeletal Robot using User’s Residual Function
Toshihito Yabunaka, Keishi Yonezawa, Norihiko Kato, Ken’ichi Yano, Yasuyuki Kobayashi, Takaaki Aoki and Yutaka Nishimoto, Mie University, Japan

15:50-16:05 Wearable Assistive Device for Lower Limbs of Caregiver on Transferring Support
Yasuhisa Hasegawa and Takashi Hoshino, Nagoya University, Japan

16:05-16:20 A Study on Tactile Display for Haptic Sensing System with Sensory Feedback for Laparoscopic Surgery
Yoshihiro Tanaka, Shuji Aragaki, Tomohiro Fukuda, Michitaka Fujiwara, and Akihito Sano, Nagoya Institute of Technology, Japan

16:20-16:35 Force Range Extension and High Force Accuracy with Pinching Support Device by Presenting Haptic Sense Based on Fingertip Sensitivity
Yasuhisa Hasegawa and Junichi Muto, Nagoya University, Japan

16:50-17:00 Coffee Break
Session TP1-2: (Organized Session) : Bio Assembler -4

Conference Room 1

Chairperson: Masaru Kojima, Osaka University
Kazuto Kamiyama, Osaka University

17:00-17:15 Temporal Change in Complex Shear Modulus of Cells: An Atomic Force Microscopy Study
PingGen Cai, Ryosuke Takahashi, Kaori Kuribayashi-Shigetomi, Agus Subagyo, Kazuhisa Sueoka and Takaharu Okajima,
Hokkaido University, Japan

17:15-17:30 Cell Pairing on a Microwell Array Electrode by Positive Dielectrophoresis
Tomoyuki Yasukawa, Yuki Yoshimura, Fumio Mizutani, University of Hyogo, Japan

17:30-17:45 Asymmetric Lattice-shaped Microchannel Structures for Continuous Size-dependent Cell Sorting
Wataru Seko, Masumi Yamada and Minoru Seki, Chiba University, Japan

17:45-18:00 miRNA-720 Regulates the Stem Cell Phenotype and Differentiation of Human Dental Pulp-derived Mesenchymal Stromal Cells
Emilio Satoshi Hara, Mitsuaki Ono, Takanori Eguchi, Hai Thanh Pham, Shoji Tajima, Stuart K. Calderwood, Takaya Matsumoto and Takuo Kuboki, Okayama University, Japan
Session TP2-2:Robotics and Mechatronics-2

Conference Room 2

Chairperson: Yasuhisa Hasegawa, Nagoya University
Kenichi Ohara, Meijo University

17:00-17:15 Development of Wrist Support Mechanism for Muscle Weakness Person to Work on Desk Work
Yasuhisa Hasegawa, Satoshi Shimada and Kiyoshi Eguchi, Nagoya University, Japan

17:15-17:30 Thin Active Fixture to Hold Finger for Easy Attachment and Comfort of Exoskeleton
Yasuhisa Hasegawa and Takeshi Suzuki, Nagoya University, Japan

17:30-17:45 Development of Face Recognition Algorithm for Enhancement of Social Communication of Robotic Assistive Autism Therapy
Mohd Ridzuan Abdul Samat, Syamimi Shamsuddin, Mohd Azfar Miskam and Hanafiah Yussof, University of Paris, France

17:45-18:00 Intention-shared User-interface by the Auto-discrimination of Gaze Object “See What I See”
Amalia Istiqlali Adiba, Nobuyuki Tanaka and Jun Miyake, Osaka University, Japan

18:10-20:30 Reception Party Universal Club
November 12 (Wed)  
Location: Noyori Conference Hall

Session WA1-1: (Organized Session) : Young Researchers in Micro-Nano Systems  
Conference Room 1

Chairperson: Hisataka Maruyama, Nagoya University  
Moeto Nagai, Toyohashi University of Technology

09:00-09:15 Direct Assembly of Movable Parts in a Microchannel using a Water-Soluble Sacrificial Layer for Biohybrid Systems  
Moeto Nagai, Kohei Tanizaki, Takahiro Kawashima and Takayuki Shibata, Toyohashi University of Technology, Japan

09:15-09:30 Trehalose Biofuel Cells using Insect Hemolymph for Insect Robots  
Kan Shoji, Yoshitake Akiyama, Masato Suzuki, Toshifumi Asano, Nobuhumi Nakamura, Hiroyuki Ohno and Keisuke Morishima, Osaka University, Japan

09:30-09:45 Evaluation of Cell-cell or Cell-substrate Adhesion Effect on Cellular Differentiation using a Microwell Array having Convertible Culture Surface  
Yuta Nakashima, Kohichi Tsusu, Yuki Hikichi, Tairo Yokokura, Kazuyuki Minami and Yoshitaka Nakanishi, Kumamoto University, Japan

09:45-10:00 Photosynthesizing Cyanobacteria inside Confined Space at Microscale  
Tadashi Ishida, Ryo Abe, Toru Omata, Nobuyuki Takatani and Tatsuo Omata, Tokyo Institute of Technology, Japan

10:00-10:15 Non-contact 3D Rotation and Capture Method for Bio-object based on Microfluidic Stream  
Yaxaier Yalikun, Asano Toshifumi, Yasunari Kanda and Keisuke Morishima, Osaka University, Japan
Session WA2-1: (Organized Session) Micro-Nano Robotics and Mechatronics  
Conference Room 2

Chairperson: Akihiko Ichikawa, Meijo University  
Nobuyuki Futai, Shibaura Institute of Technology

09:00-09:15  A Microfluidic Static Gradient Generator using Limited Diffusion Through T-shaped Narrow Channels  
Makoto Tamura, Shugo Maeda, Tomohisa Ogawa, Masato Tanaka and Nobuyuki Futai, Shibaura Institute of Technology, Japan

09:15-09:30  Leakage-free Reconfigurable Microchannel Having Moving Sidewalls Sealed with Hydrocarbon Sealant and Oil Seals  
Masahiro Oono, Kousuke Mikami and Nobuyuki Futai, Shibaura Institute of Technology, Japan

09:30-09:45  Measurement of Cellular Reactive Force on a Microfluidic Chip using Moiré Fringe  
Hirotaka Sugiura, Shinya Sakuma, Makoto Kaneko and Fumihito Arai, Nagoya University, Japan

09:45-10:00  Estimation Method of Operating Force using an Extended Kalman Filter Based on Ground Reaction Force and Human Behavior  
Taishi Noro, Yusuke Katsuda, Takanori Miyoshi and Kazuhiko Terashima, Toyohashi University of Technology, Japan

10:00-10:15  The Study of Medical Micro Device for the Next Generation Brain Intravascular Treatment  
Akihiko Ichikawa, Takahiro Itou, Kouhei Shimogaito, Takashi Kubo and Toshio Fukuda, Meijo University, Japan

10:15-10:30  Coffee Break
Keynote Talk  

Chairperson: Takaharu Okajima, Hokkaido University

10:30-11:00 Keynote Talk 1
Microbial Rhodopsins from Marine Bacteria: Nano-scale Biological Light-driven Ion Pumps
Assistant Prof. Keiichi Inoue, Nagoya Institute of Technology, Japan

11:00-11:30 Keynote Talk 2
Active Biophysical Properties of Cells and Subcellular Components
Associate Prof. Shinji Deguchi, Nagoya Institute of Technology, Japan

11:30-11:40 Coffee Break

11:40-12:00 Award Ceremony

12:00-13:30 Lunch

13:30-15:00 Laboratory Tour

Conference Room 1

Nagoya University