

## ***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**

### ***23rd 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 Category2a: Fully Autonomous Micro Robot Maze Competition
- 12:00 Category3a: Biped Micro Robot Competition
- 12:20 Lunch Break
- 13:00 Category4: Micro Robot Performance
- 13:15 Category1: Teleoperated Micro Robot Maze Competition
- 14:15 Category2b: Remote-Controlled Micro Robot Maze Competition
- 15:25 Category3b: Multiple Legged Micro Robot Competition
- 16:00 Break
- 16:30 Award Ceremony and Closing

November 10 (Mon)  
Location: Noyori Conference Hall

***Opening Remarks***

***Conference Room 1***

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***

***Conference Room 1***

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**

**Poster Area(1<sup>st</sup> floor)**

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 Tstuno, 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**

**Conference Room 1**

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, Takano Kogure and Shingo Maeda, Shibaura  
Institute of Technology, Japan*

15:35-15:50 On-chip Force Measurement System for Investigating Plant-root Growth  
*Hirofumi 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*
- 15:05-15:20    Precise Time Synchronization Device for Distributed Robot System  
Cooperation  
*Kenichi Ohara, Meijo University, Japan*
- 15:20-15:35    3D Movement of Legged Robot in Narrow Space  
*Takeshi Toda, Kenichi Ohara, Kazuto Kamiyama, Masaru Kojima,  
Mitsuhiro Horade, Yasushi Mae and Tatsuo Arai, Osaka University,  
Japan*
- 15:35-15:50    Development of Simplified Haptic Interface for Two-finger  
Micro-manipulator  
*Kazuto Kamiyama, Masaru Kojima, Mitsuhiro Horade, Yasushi Mae and  
Tatsuo ARAI, Osaka University, Japan*
- 15:50-16:05    3D Gait Planning Based on Discrete-time Kinematic Model of Biped  
Walking  
*Daiki Kobayashi, Tomohito Takubo and Atsushi Ueno, Osaka City  
University, Japan*
- 16:05-16:20    Camera View Centered Mobile Robot Control Interface  
*Naoto Hirakawa, Tomohito Takubo and Atsushi Ueno, Osaka City  
University, Japan*
- 16:35-16:45    ***Coffee Break***

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

November 11 (Tue)  
Location: Noyori Conference Hall

**Technical Sessions**

**Session TAI-1: (Organized Session) : Bio-Assembler -1**

**Conference Room 1**

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

**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 TAI-2: (Organized Session) :Bio-Assembler -2**

**ConferenceRoom 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*
- 10:40-10:55 Real-time Sequentially Decision for Optimal Action using Prediction of the State-Action Pair  
*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(1<sup>st</sup> 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 Kotera 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 Kagiya, 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 Tanikawa, Kazuto Kamiyama, Yasushi Mae1 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  
*Ipei 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, Yasuhisa 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 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*
- 15:35-15:50 Quantitative Rheological Measurements of Confluent Cell using Atomic Force Microscopy  
*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, Takuya 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 WAI-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  
*Hiroataka 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**

**Conference Room 1**

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** **Conference Room 1**

12:00-13:30 **Lunch**

13:30-15:00 **Laboratory Tour** **Nagoya University**