

# Biomedical Imaging and Sensing Conference '14

## BISC'14

Tuesday, April 22

**15:30-16:00 Opening** Room 313+314

Opening Remarks

**15:30** T. Omatsu, Conference Chair of OMC' 14  
Chiba Univ., Japan

**16:00-18:00 BISC& OMC Joint session**

Room 313+314

Chair: K. Sasaki, Co-Chair of OMC'14

Hokkaido Univ., Japan

**BISC&OMC-1 (Plenary) New perspectives for optical  
16:00 manipulation in air and vacuum**

K. Dholakia  
Univ. St. Andrews, UK

**BISC&OMC-2 (Plenary) Polarization-sensitive OCT  
16:40 (PS-OCT) for retinal imaging**

B. Cense  
Utsunomiya Univ., Japan

**BISC&OMC-3 (Plenary) Optical Tweezers Based  
17:20 Biomicroheology**

A. Chiou  
National Yang-Ming Univ., Taiwan

Wednesday, April 23

**9:00-9:15 Opening** Room 303

Opening Remarks

**9:00** T. Yatagai, Conference Chair of BISC' 14  
Utsunomiya Univ., Japan

**9:15-10:30 BISC1 : Holography, Delivery Technique**

Room 303

Chair: O. Matoba, Steering Committee Chair of BISC'14,  
Kobe Univ., Japan

**BISC1-1 (Plenary) Digital Holographic Microscopy in  
9:15 the Life Sciences**

Gert von Bally  
Universitätsklinikum Münster, Germany

**BISC1-2 (Invited) Targeted Delivery and Controlled  
10:00 Release of Molecules by the Use of  
Photomechanical Waves**

S. Sato  
National Defense Medical College Research  
Institute, Japan

----- Break (10:30-10:45) -----

**10:45-12:15 BISC2 : Raman Spectroscopy** Room 303

Chair: T. Iwai, Program Committee Member of BISC'14,

Tokyo Univ. of Agri. & Tech., Japan

**BISC2-1 (Invited) Multicolor, Stain-free Imaging of  
10:45 Tissue with Stimulated Raman Scattering**

Y. Ozeki  
The Univ. of Tokyo, Japan

**BISC2-2 Slit-scanning Raman Microscope for Imaging  
11:15 Biological Functions**

K. Fujita <sup>1,2)</sup>, A.F. Palonpon <sup>2)</sup>, L.-da Chiu <sup>1)</sup>, M.  
Okada <sup>1)</sup>, H. Yamakoshi <sup>2)</sup>, J. Ando <sup>2)</sup>, K. Dodo  
<sup>2,3)</sup>, N.I. Smith <sup>4)</sup>, M. Sodeoka <sup>2,3)</sup>, and S. Kawata  
<sup>1)</sup>

<sup>1)</sup> Osaka Univ., Japan, <sup>2)</sup> JST-ERATO, Japan, <sup>3)</sup>  
RIKEN, Japan, <sup>4)</sup> IFRC, Osaka Univ., Japan

**BISC2-3 Raman Spectroscopic Study for Osteoporosis  
11:30 in Ovariectomised (OVX) Rats**

Y. Oshima <sup>1,2,3)</sup>, T. Iimura <sup>2,3)</sup>, A. Hikita <sup>1,3)</sup>, T.  
Imamura <sup>1,2,3)</sup>

<sup>1)</sup> Ehime Univ. Hospital, Japan, <sup>2)</sup> Ehime Univ. of  
Medicine, Japan, <sup>3)</sup> Ehime Univ., Japan

**BISC2-4 (Invited) Optical Biopsy System Based on  
11:45 Hollow Optical Fibers**

Y. Matsuura  
Tohoku Univ., Japan

----- Lunch Break (12:15-13:30) -----

**13:30-15:30 BISC3: Poster Session** Exhibition Hall C

**BISCp3-1 Phase-Contrast Scanning Optical Microscopy  
of Biological Tissues Using Annular  
Illumination**

Y. Miyake, M. Hisaka, and T. Ikuta  
Osaka Electro-Communication Univ., Japan

**BISCp3-2 High Spatial Resolution Time-lapse Imaging  
with Electron-beam Excitation Assisted  
Optical Microscope**

W. Inami <sup>1,3)</sup>, M. Fukuta <sup>1)</sup>, Y. Masuda <sup>1)</sup>, Y.  
Nawa <sup>1,2)</sup>, A. Ono <sup>1,3)</sup>, S. Lin <sup>1)</sup>, Y. Kawata <sup>1,3)</sup>,  
and S. Terakawa <sup>3,4)</sup>

<sup>1)</sup> Shizuoka Univ., Japan, <sup>2)</sup> JSPS, Japan, <sup>3)</sup>  
CREST, JST, Japan, <sup>4)</sup> Hamamatsu Univ. of  
Medicine, Japan

**BISCp3-3 Observation of Aggregation Structure of Red  
7 Blood Cells in Blood Coagulation Using Digital  
Holographic Microscopy**

H. Funamizu, Y. Watanabe, and Y. Aizu  
Muroran Inst. Tech., Japan

**BISCp3-4 Observation of Sound Wave Field by Using  
Digital Holography**

H. Inokuchi <sup>1)</sup>, K. Nitta <sup>1)</sup>, O. Matoba <sup>1)</sup>, and Y.  
Awatsuji <sup>2)</sup>

<sup>1)</sup> Kobe Univ., Japan, <sup>2)</sup> Kyoto Inst. Tech., Japan

**BISCp3-5 Analyzing Influence of Degree of Temporal  
Coherence on Incoherent Digital Holography**

X. Quan <sup>1)</sup>, K. Nitta <sup>1)</sup>, O. Matoba <sup>1)</sup>, and Y.  
Awatsuji <sup>2)</sup>

<sup>1)</sup> Kobe Univ., Japan, <sup>2)</sup> Kyoto Inst. Tech., Japan

**BISCp3-6 Extension of the Space-bandwidth Product in  
Single-shot Multiwavelength Interferometry  
Using a Single Reference Beam**

T. Tahara and Y. Arai  
Kansai Univ., Japan

**BISCp3-7 Signal Model Analysis in the Single Shot Wide  
Field Optical Coherence Tomography**

T. Anna <sup>1)</sup>, D.S. Mehta <sup>2)</sup>, and M. Sato <sup>1)</sup>

<sup>1)</sup> Yamagata Univ., Japan, <sup>2)</sup> Indian Inst. Tech.,  
India

**BISCp3-8 Precise Measurement of Instantaneous Volume  
of Sweat Gland in Mental Sweating by Optical  
Coherence Tomography**

Y. Sugawa, A. Fukuda, and M. Ohmi  
Osaka Univ., Japan

**BISCp3-9 Reconstruction Evaluation of Absorbers in  
Scattering Medium by Using Intensity Ratio  
with Time-Resolved Observation**

T. Yamaoki, K. Nitta, and O. Matoba  
Kobe Univ., Japan

**BISCp3-10 Monte Carlo Simulation for Determination of  
Optical Properties from Time-resolved  
Reflectance Measured with a Small Probe**

## Separation

K. Nadamoto <sup>1</sup>, T. Iwase <sup>2</sup>, Y. Tanikawa <sup>3</sup>, Y. Hoshi <sup>2</sup>, and E. Okada <sup>1</sup>

<sup>1</sup> Keio Univ., Japan, <sup>2</sup> Tokyo Metropolitan Inst. Medical Science, Japan, <sup>3</sup> AIST, Japan

### BISCp3-11 Correction of Optical Path Length for Measurement of Haemoglobin Change in Exposed Cortex

Y. Yoshimori <sup>1</sup>, T. Kikuchi <sup>1</sup>, H. Takuwa <sup>2</sup>, H. Kawaguchi <sup>2</sup>, K. Masamoto <sup>2,3</sup>, H. Ito <sup>2</sup>, and E. Okada <sup>1</sup>

<sup>1</sup> Keio Univ., Japan, <sup>2</sup> National Institute of Radiological Sciences, Japan, <sup>3</sup> Univ. Electro-Communications, Japan

### BISCp3-12 Estimation of Spatial Distribution of Partial Optical Path Length in Brain for Functional Near-infrared Spectroscopy

K. Nakamura <sup>1</sup>, K. Kurihara <sup>1</sup>, S. Ichimura <sup>1</sup>, H. Kawaguchi <sup>2</sup>, T. Obata <sup>2</sup>, H. Ito <sup>2</sup>, and E. Okada <sup>1</sup>

<sup>1</sup> Keio Univ., Japan, <sup>2</sup> National Institute of Radiological Sciences, Japan

### BISCp3-13 Effect of High-density Probe Arrangement on Image Quality of Near-infrared Topography

Y. Sakakibara, S. Ichimura, M. Tato, K. Kurihara, and E. Okada

Keio Univ., Japan

### BISCp3-14 Influence of Incidence and Detection Conditions on Diffuse Reflectance Spectrum of Skin

M. Kato, M. Ohtake, T. Ohtsuka, and E. Okada

Keio Univ., Japan

### BISCp3-15 Hybrid Mie-MCML Monte Carlo Simulation for Analysis of Light Propagation in Skin Layers

Y. Kawai and T. Iwai

Tokyo Univ. of Agri. & Tech., Japan

### BISCp3-16 Effect of the Surface Roughness on the Reflection and Scattering Properties of Human Skin

K. Tsukamoto <sup>1</sup>, T. Igarashi <sup>2</sup>, M. Takabayashi <sup>1</sup>, and T. Okamoto <sup>1</sup>

<sup>1</sup> Kyushu Inst. Tech., Japan, <sup>2</sup> Kao Corp., Japan

### BISCp3-17 Relationship between Skin Surface Reflection and Skin Surface Shape

T. Katsuyama

Shiseido Research Center, Japan

### BISCp3-18 Near-infrared Microscopic Water Imaging of the Skin

M. Egawa <sup>1</sup>, M. Yanai <sup>1</sup>, H. Arimoto <sup>2</sup>, T. Kuwahara <sup>1</sup>, T. Hirao <sup>1</sup>

<sup>1</sup> Shiseido Research Center, Japan, <sup>2</sup> AIST, Japan

### BISCp3-19 Imaging of Pigmentation in Human Facial Skin by a Spectral Camera and its Application

K. Kikuchi, Y. Masuda, and T. Hirao

Shiseido Research Center, Japan

### BISCp3-20 Study on Depth Measurement of a Blood Flow Region Based on Speckle Correlation

N. Yokoi <sup>1</sup> and Y. Aizu <sup>2</sup>

<sup>1</sup> Asahikawa National College of Tech., Japan, <sup>2</sup> Muroran Inst. Tech., Japan

### BISCp3-21 Range Expansion Using Higher Order Optical Frequency Comb Interferometry

T. Sato and T. Shioda

Saitama Univ., Japan

----- Break (15:30-15:45) -----

## 15:45-17:45 BISC4 : High-resolution Imaging, Fluorescence

### Technique

Room 303

Chair: K. Fujita, Osaka Univ., Japan

### BISC4-1 (Invited) Optical Bio-imaging Using Complex Scattering Media

W. Choi

Korea Univ., South Korea

### BISC4-2 (Invited) Scattering Super-lens: Subwavelength Light Focusing and Imaging via Wavefront Shaping in Complex Media

J.H. Park <sup>1</sup>, C. Park <sup>1,2</sup>, Y.H. Cho <sup>1,2</sup>, and Y.K. Park <sup>1</sup>

<sup>1</sup> KAIST, South Korea, <sup>2</sup> Graduate School of Nanoscience and Technology and KAIST, Korea

### BISC4-3 D-EXA Microscopy for Live Cell Imaging with Nanophosphors

Y. Nawa <sup>1,2</sup>, W. Inami <sup>1,3</sup>, A. Ono <sup>1,3</sup>, S. Lin <sup>1</sup>, Y. Kawata <sup>1,3</sup>, and S. Terakawa <sup>3,4</sup>

<sup>1</sup> Shizuoka Univ., Japan, <sup>2</sup> JSPS, Japan, <sup>3</sup> CREST, JST, Japan, <sup>4</sup> Hamamatsu Univ. of Medicine, Japan

### BISC4-4 High Sensitive Fluorescence Observation of Organelles in Cells by Deep-UV SPR

M. Kikawada <sup>1</sup>, A. Ono <sup>1,2</sup>, W. Inami <sup>1,2</sup>, and Y. Kawata <sup>1,2</sup>

<sup>1</sup> Shizuoka Univ., Japan, <sup>2</sup> CREST, JST, Japan

### BISC4-5 Local Viscosity Mapping inside a Cell with Two-dimensional Fluorescence-correlation Spectroscopy

T. Sugiura <sup>1</sup> and M. Matsumoto <sup>2</sup>

<sup>1</sup> Nara Inst. Science and Tech., Japan, <sup>2</sup> Himeji Dokkyo Univ., Japan

### BISC4-6 Development of Fluorescent Nano-Bioprobes Using Bacteriophage T7

I. Maeda and M. Tsuboyama

Utsunomiya Univ., Japan

Thursday, April 24

## 9:00-10:30 BISC5 : Photoacoustic Imaging, Spectroscopic Imaging

Room 303

Chair: E. Okada, Program Committee Member of BISC'14,

Keio Univ., Japan

### BISC5-1 Development of a Compact Acoustic-resolution Photoacoustic Imaging System with Fiber-based Illumination and Its Application to Vascular Imaging

Y. Tsunoi <sup>1</sup>, S. Sato <sup>2</sup>, R. Watanabe <sup>1</sup>, S. Kawauchi <sup>2</sup>, H. Ashida <sup>2</sup>, and M. Terakawa <sup>1</sup>

<sup>1</sup> Keio Univ., Japan, <sup>2</sup> National Defense Medical College Research Institute, Japan

### BISC5-2 Development of Near-infrared Multispectral Imaging for Quantitative Diagnosis of Atherosclerotic Plaque

R. Nagao, K. Ishii, and K. Awazu

Osaka Univ., Japan

### BISC5-3 Unconstrained Imaging of Venous Compliance Using RGB Camera

K. Nakano <sup>1</sup>, R. Matsuda <sup>2</sup>, R. Satoh <sup>2</sup>, H. Suzuki <sup>3</sup>, and I. Nishidate <sup>2</sup>

<sup>1</sup> Nippon Sport Science Univ., Japan, <sup>2</sup> Tokyo Univ. of Agriculture and Tech., Japan, <sup>3</sup> Tokyo

	Inst. Tech., Japan		Japan
<b>BISC5-4</b> <b>9:45</b>	<b><i>In vivo</i> Multispectral Imaging of the Absorption and Scattering Properties of Exposed Rat Brain Using a Digital Red-green-blue Camera</b> K. Yoshida <sup>1)</sup> , T. Ishizuka <sup>1)</sup> , C. Mizushima <sup>1)</sup> , I. Nishidate <sup>1)</sup> , S. Kawauchi <sup>2)</sup> , S. Sato <sup>2)</sup> , and M. Sato <sup>3)</sup> <sup>1)</sup> Tokyo Univ. of Agriculture and Tech., Japan, <sup>2)</sup> National Defense Medical College Research Institute, Japan, <sup>3)</sup> Yamagata Univ., Japan	<b>----- Lunch Break (12:15-13:30) -----</b> <b>13:30-15:30 BISC7: Terahertz Sensing</b>	Room 303
		<b>Organized Session</b> <b>Chair: T. Yasui, Program Committee Member of BISC'14,</b> Tokushima Univ., Japan	
<b>BISC5-5</b> <b>10:00</b>	<b>Noncontact Imaging of Human Skin Hemodynamics Using a Digital Red-green-blue Camera</b> I. Nishidate <sup>1)</sup> , R. Matsuda <sup>1)</sup> , R. Sato <sup>1)</sup> , T. Maeda <sup>2)</sup> , T. Yuasa <sup>3)</sup> , T. Yuasa <sup>4)</sup> , K. Niizeki <sup>4)</sup> , and Y. Aizu <sup>3)</sup> <sup>1)</sup> Tokyo Univ. of Agriculture and Tech., Japan, <sup>2)</sup> Kushiro National College of Tech., Japan, <sup>3)</sup> Muroran Inst. Tech., Japan, <sup>4)</sup> Yamagata Univ., Japan	<b>BISC7-1</b> <b>13:30</b>	<b>(Invited) Development of Meta-material Sensors for Bioapplications</b> Y. Ogawa and T. Suzuki Kyoto Univ., Japan
<b>BISC5-6</b> <b>10:15</b>	<b>Imaging by Tandem Optics using Short Multimode Fiber and GRIN Lens</b> M. Sato <sup>1)</sup> , Y. Sekine <sup>1)</sup> , H. Suto <sup>1)</sup> , T. Kanno <sup>1)</sup> , S. Ishihara <sup>1)</sup> , T. Takahashi <sup>1)</sup> , and I. Nishidate <sup>2)</sup> <sup>1)</sup> Yamagata Univ., Japan, <sup>2)</sup> Tokyo Univ. of Agriculture and Tech., Japan	<b>BISC7-2</b> <b>14:00</b>	<b>(Invited) Terahertz Spectroscopic Measurement of Raw Cancer Model Tissues</b> N. Miyoshi <sup>1)</sup> , T. Nagashima <sup>2)</sup> , T. Takahashi <sup>3)</sup> , R. Kato <sup>2)</sup> , and K. Fukui <sup>1)</sup> <sup>1)</sup> Univ. of Fukui, Japan, <sup>2)</sup> Osaka Univ., Japan, <sup>3)</sup> Kyoto Univ., Japan
	<b>----- Break (10:30-10:45) -----</b>	<b>BISC7-3</b> <b>14:30</b>	<b>(Invited) Detection of Bio-related Materials Using Laser-terahertz Technique</b> T. Kiwa, A. Nakamura, Y. Okawa, K. Sakai, and K. Tsukada Okayama Univ., Japan
<b>10:45-12:15</b>	<b><u>BISC6 : Imaging, Tomography, Spectroscopy</u></b> Room 303	<b>BISC7-4</b> <b>15:00</b>	<b>(Invited) Terahertz Near-field Microscopy for Biological Sensing and Imaging</b> K. Tanaka <sup>1,2)</sup> , T. Tanaka <sup>1,2)</sup> , A. Doi <sup>3)</sup> , and F. Blanchard <sup>1)</sup> <sup>1)</sup> Kyoto Univ., Japan, <sup>2)</sup> CREST, JST, Japan, <sup>3)</sup> Olympus Corp., Japan
<b>Chair: M. Sato, Program Committee Member of BISC'14,</b> Yamagata Univ., Japan		<b>15:45-17:45</b>	<b><u>BISC8 : OCT, Digital Holography, Imaging, Molecular Sensing</u></b> Room 303
<b>BISC6-1</b> <b>10:45</b>	<b>Development of New Optical CT for 3D Animal Imaging — Practical Technique Using Transillumination Images —</b> T.T. Nghia <sup>1)</sup> , K. Yamamoto <sup>1)</sup> , T. Namita <sup>2)</sup> , Y. Kato <sup>1)</sup> , and K. Shimizu <sup>1)</sup> <sup>1)</sup> Hokkaido Univ., Japan, <sup>2)</sup> Kyoto Univ., Japan	<b>Chair: Y. Otani, Steering Committee Member of BISC'14,</b> Utsunomiya Univ., Japan	
<b>BISC6-2</b> <b>11:00</b>	<b>The Effect of Data at a Detection Limit on 3-D Time Domain Diffuse Optical Tomography</b> D. Furukawa, K. Awasthi, and G. Nishimura Hokkaido Univ., Japan	<b>BISC8-1</b> <b>15:45</b>	<b>Determination of Resonant Frequency of Human Sweat Duct Based on the Duct Dimension Obtained Using Optical Coherence Tomography</b> S.R. Tripathi <sup>1)</sup> , H. Yamada <sup>1)</sup> , E. Miyata <sup>1)</sup> , and K. Kawase <sup>1,2)</sup> <sup>1)</sup> Nagoya Univ., Japan, <sup>2)</sup> RIKEN ASI, Japan
<b>BISC6-3</b> <b>11:15</b>	<b>Spectroscopic Mueller Matrix Microscope Using Dual-rotating Retarders</b> M. Sakaguchi, Y. Kodama, and Y. Otani Utsunomiya Univ., Japan	<b>BISC8-2</b> <b>16:00</b>	<b>(Invited) Applications of Incoherent Digital Holography</b> J. Hong, C. Liu, and M.K. Kim Univ. South Florida, USA
<b>BISC6-4</b> <b>11:30</b>	<b>Palm-Top-Size Portable Apparatus of Wide-Field Fourier-Spectroscopic-Imaging in Mid Infrared Region</b> Y. Suzuki, W. Qi, S. Suzuki, P.K.W. Abeygunawardhana, and I. Ishimaru Kagawa Univ., Japan	<b>BISC8-3</b> <b>16:30</b>	<b>Portable Phase-shifting Lensless Digital Holographic Microscopy</b> K. Hoshino and E. Watanabe The Univ. of Electro-Communications, Japan
<b>BISC6-5</b> <b>11:45</b>	<b>Proposal of One-shot-type Spectroscopic-tomography for Non-invasive Medical-measurement</b> S. Sato, M. Fujiwara, P.K.W. Abeygunawardhana, S. Suzuki, A. Nishiyama, and I. Ishimaru Kagawa Univ., Japan	<b>BISC8-4</b> <b>16:45</b>	<b>Numerical Study for Comparing the Performance between 2-step and 3-step Single-shot Complex Amplitude Measurement Using Transport of Intensity Equation</b> P. Xia <sup>1)</sup> , Y. Awatsuji <sup>1)</sup> , S. Ura <sup>1)</sup> , K. Nishio <sup>1)</sup> , and O. Matoba <sup>2)</sup> <sup>1)</sup> Kyoto Inst. Tech., Japan, <sup>2)</sup> Kobe Univ., Japan
<b>BISC6-6</b> <b>12:00</b>	<b>Optical Zoom for the Single-shot Tomography and Profilometry Using Diffraction Orders of a Reflection Grating</b> T.B. Quoc <sup>1)</sup> and T. Shioda <sup>2)</sup> <sup>1)</sup> Nagaoka Univ. Tech., Japan, <sup>2)</sup> Saitama Univ.,	<b>BISC8-5</b> <b>17:00</b>	<b>An Intra-oral Diagnostic System Based on a Compound-imaging Module</b> H. Mima <sup>1)</sup> , K. Kagawa <sup>2)</sup> , C. Ogata <sup>3)</sup> , and J. Tanida <sup>1)</sup> <sup>1)</sup> Osaka Univ., Japan, <sup>2)</sup> Shizuoka Univ., Japan, <sup>3)</sup> Osaka Dental Univ., Japan
		<b>BISC8-6</b> <b>17:15</b>	<b>Optical Control of FRET Path for Programmable Molecular Sensing</b> R. Fujii, T. Nishimura, Y. Ogura, and J. Tanida Osaka Univ., Japan

