

# **CRC International Symposium on Bio-interface and Biomass Conversion**

*(The 2<sup>nd</sup> CRC Research Cluster Symposium on Structure and Function of Bio-interface  
& The 22<sup>nd</sup> CRC International Symposium on Biomass Conversion)*

**October 29-31, 2008**

**Catalysis Research Center, Hokkaido University, Japan**

**Organizer:** Catalysis Research Center (CRC), Hokkaido University

**Co-sponsors:** Hokkaido University Global COE Program:  
"Catalysis as the Basis for the Innovation Materials Science";  
The Hokkaido Branch of the Chemical Society of Japan;  
Division of Catalytic Biomass Conversion, Catalysis Society of Japan;  
The Hokkaido Branch of the Electrochemical Society of Japan;  
The Hokkaido Branch of the Japan Society for Analytical Chemistry;  
The Hokkaido Branch of the Spectroscopical Society of Japan;

**Cooperation:** The Surface Science Society of Japan

**Conference Venue:**

Catalysis Research Center, Hokkaido University, N-21 W-10, Kita-ku, Sapporo 001-0021, Japan  
Conference Room (Sousei Building 5<sup>th</sup> floor): Registration and Oral Presentations  
Science Plaza (Sousei Building 2<sup>nd</sup> floor): Poster Presentations

**Organizing Committee:**

Prof. Atsushi Fukuoka (Chair), Prof. Masatoshi Osawa, Dr. Shen Ye (Secretary), Dr. Kenji Hara

**Registration Fee:** Conference, Free  
Drinks at Poster Session, 2,000 JPY (Student, 1,000 JPY)

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## Time Table

October 29, 2008

8:30~	Registration
8:50~9:00	Opening Address
<b>Bio-interface Session: Bioelectrochemistry</b>	
9:00~9:50	Isao Taniguchi (Kumamoto Univ., Japan)
9:50~10:20	Osamu Niwa (AIST, Japan)
10:20~10:40	Break
10:40~11:10	Tomokazu Matsue (Tohoku Univ., Japan)
11:10~11:50	Hsien-Chang Chang (National Cheng Kung Univ., Taiwan)
11:50~12:20	Ryuhei Nakamura (Univ. of Tokyo, Japan)
12:20~13:30	Lunch
<b>Bio-interface Session: Chirality, Imaging and Biomolecule Interface</b>	
13:30~14:00	Kenji Monde (Hokkaido Univ., Japan)
14:00~14:30	Hidenori Noguchi (Hokkaido Univ., Japan)
14:30~15:20	Yuen R. Shen (Univ. of California, Berkeley, USA)
15:20~15:40	Break
15:40~16:10	Kei Murakoshi (Hokkaido Univ., Japan)
16:10~16:40	Kenichi Ataka (Bielefeld Univ., Germany)
16:40~17:10	Mitsutoshi Setou (Hamamatsu Med. Univ., Japan)

October 30, 2008

<b>Bio-interface Session: Biophysics and Biomaterial Interface</b>	
9:00~9:30	Shen Ye (Hokkaido Univ., Japan)
9:30~10:10	John Conboy (Utah Univ., USA)
10:10~10:30	Break
10:30~11:00	Koichi Itoh (Waseda Univ., Japan)
11:00~11:30	Katsutoshi Hori (Nagoya Tech. Inst., Japan)
11:30~12:00	Masaru Tanaka (Tohoku Univ., Japan)
12:00~12:15	Group Photo
12:15~13:30	Lunch
<b>Biomass Conversion Session</b>	
13:30~14:10	Marcel Schlaf (Univ. of Guelph, Canada)
14:10~14:50	Chandrashekhar V. Rode (National Chemical Laboratory, India)
14:50~15:30	Z. Conrad Zhang (KiOR Inc., USA)
15:30~15:50	Break
15:50~16:30	Haichao Liu (Peking Univ., China)
16:30~17:00	Michikazu Hara (Tokyo Institute of Technology, Japan)
17:00~17:30	Ayumu Onda (Kochi Univ., Japan)
17:30~18:00	Atsushi Fukuoka (Hokkaido Univ., Japan)
18:00~20:00	Poster Presentation

October 31, 2008

<b>Biomass Conversion Session</b>	
10:00~10:30	Paresh L. Dhepe (National Chemical Laboratory, India)
10:30~11:00	Tamao Ishida (Tokyo Metropolitan Univ., Japan)
11:00~11:30	Masayuki Shirai (AIST, Japan)
11:30~11:40	Break
11:40~12:10	Seiichi Taguchi (Hokkaido Univ., Japan)
12:10~12:50	Victor S. -Y. Lin (Iowa State Univ., USA)
12:50~12:55	Closing Remarks

## Program

### October 29 (Wed)

08:30-08:50      **Registration**

08:50-09:00      **Opening Address**

**Prof. Wataru Ueda** (Director, CRC, Hokkaido Univ.)

### *Bio-interface Session: Bioelectrochemistry*

Chair: Masatoshi Osawa

O-1      09:00-09:50      **Isao Taniguchi** (Kumamoto Univ., Japan)  
“Bio-compatible Interfaces for Direct Electron Transfer Reactions of Biological Molecules and Their Applications”

O-2      09:50-10:20      **Osamu Niwa** (AIST, Japan)  
“Nanocarbon Films for Electrochemical Interface of Non-label DNA Detection”

10:20-10:40      Break

Chair: Tamotsu Takahashi

O-3      10:40-11:10      **Tomokazu Matsue** (Tohoku Univ., Japan)  
“Electrochemical Detection of Gene Expression in a Single Living Cell”

O-4      11:10-11:50      **Hsien-Chang Chang** (National Cheng Kung Univ., Taiwan)  
“A Novel SERS Active Particle with Highly Bio-organics Absorption Affinity for the Description of Bacteria Fingerprint”

O-5      11:50-12:20      **Ryuhei Nakamura & Kazuhito Hashimoto** (Univ. of Tokyo, Japan)  
“Self-constructed Electrically Conductive Bacterial Networks”

12:20-13:30 Lunch

***Bio-interface Session: Chirality, Imaging and Biomolecule Interface***

Chair: Satoru Takakusagi

O-6 13:30-14:00 **Kenji Monde** (Hokkaido Univ., Japan)  
“What Can We Do for Biomolecules Using Vibrational Circular Dichroism (VCD) ?  
– Chiroptical Analysis of Glycoconjugates and Related Materials –”

O-7 14:00-14:30 **Hidenori Noguchi & Kohei Uosaki** (Hokkaido Univ., Japan)  
“Biomaterials and Functional Surfaces Studied by *in situ* Surface Vibrational Spectroscopies”

Chair: Kohei Uosaki

O-8 14:30-15:20 **Yuen R. Shen** (Univ. of California, Berkeley, USA)  
“Sum-Frequency Spectroscopy for probing Molecular Chirality and Water Interfaces”

15:20-15:40 Break

Chair: Masamichi Ogasawara

O-9 15:40- 16:10 **Kei Murakoshi** (Hokkaido Univ., Japan)  
“Segregation of Molecules in Lipid Bilayer Spreading Through Metal Nano-gate”

O-10 16:10-16:40 **Kenichi Ataka** (Bielefeld Univ., Germany)  
“Toward the Functional Study of Membrane Protein Monolayer: A Vibrational Spectroscopic Approach by Surface Enhanced Infrared Absorption Spectroscopy”

O-11 16:40-17:10 **Mitsutoshi Setou** (Hamamatsu Med. Univ., Japan)  
“Nanoparticle-assisted Laser Desorption/Ionization (Nano-PALDI) Based Mass Imaging with Cellular Resolution”

**October 30 (Thu)**

***Bio-interface Session: Biophysics and Biomaterial Interface***

Chair: Tatsuya Tsukuda

O-12 09:00-09:30 **Shen Ye** (Hokkaido Univ., Japan)  
“Molecular Structures of Lipid Films Investigated by Sum Frequency Generation (SFG) Spectroscopy”

O-13 09:30-10:10 **John Conboy** (Utah Univ., USA)  
“Nonlinear Vibrational Spectroscopy for the Analysis of Lipid Membrane Structure and Dynamics”

10:10-10:30 Break

Chair: Ryu Abe

O-14 10:30-11:00 **Koichi Itoh** (Waseda Univ., Japan)  
“Sum Frequency Generation Spectroscopy on Biological Membrane Models at the Air-Water Interface”

O-15 11:00-11:30 **Katsutoshi Hori** (Nagoya Tech. Inst., Japan)  
“Interaction between Bacterial Cells and Interfaces”

O-16 11:30-12:00 **Masaru Tanaka** (Tohoku Univ., Japan)  
“Design and Fabrication of Novel Bio-interface Using Self-organization to Control of Cell Functions”

12:00-12:15 Group Photo  
5<sup>th</sup> floor, Conference Room

12:15-13:30 Lunch Meeting (Invited speakers and CRC faculties)  
4<sup>th</sup> floor, Seminar Room B&C

### ***Biomass Conversion Session***

Chair: Atsushi Fukuoka

O-17 13:30-14:10 **Marcel Schlaf** (Univ. of Guelph, Canada)  
“Group 8 Metal Complexes as Homogeneous Ionic Hydrogenation and Hydrogenolysis Catalysts for the Deoxygenation of Biomass to Petrochemicals - Opportunities, Challenges, Strategies and the Story so far”

Chair: Kenji Hara

O-18 14:10-14:50 **Chandrashekhar V. Rode** (National Chemical Laboratory, India)  
“Liquid Phase Dehydration vs. Hydrogenolysis of Bioglycerol”

O-19 14:50-15:30 **Z. Conrad Zhang** (KiOR Inc., USA)  
“A New Pathway for Cellulose Depolymerization and Catalytic Conversion of Sugars to Hydroxymethylfurfural”

15:30-15:50 Break

Chair: Miho Yamauchi

O-20 15:50-16:30 **Haichao Liu** (Peking Univ., China)  
“A Novel Strategy for Biomass Utilization: Catalytic Synthesis and Reactions of Polyols”

O-21 16:30-17:00 **Michikazu Hara** (Tokyo Institute of Technology, Japan)  
“Hydrolysis of Cellulose into Glucose by Using a Carbon Material”

Chair: Kiyotaka Asakura

O-22 17:00-17:30 **Ayumu Onda** (Kochi Univ., Japan)  
“Selective Hydrolysis of Cellulose and Starch into Glucose under Hydrothermal Conditions Using Sulfonated Activated-Carbon Catalyst”

O-23 17:30-18:00 **Atsushi Fukuoka** (Hokkaido Univ., Japan)  
“Sustainable Green Catalysis for the Conversion of Nonfood Biomass”

18:00-20:00 **Poster Session** (Science Plaza, 2F)

**October 31 (Fri)**

***Biomass Conversion Session***

Chair: Tatsuya Takeguchi

O-24 10:00 - 10:30 **Paresh L. Dhepe** (National Chemical Laboratory, India)  
“Heterogeneous Catalysts for the Conversion of Biomolecules”

O-25 10:30 - 11:00 **Tamao Ishida** (Tokyo Metropolitan Univ., Japan)  
“Influence of Support and Size of Gold Catalysts for Aerobic Oxidation of Glucose”

O-26 11:00 – 11:30 **Masayuki Shirai** (AIST, Japan)  
“Low Temperature Gasification of Lignin over Supported Metal Catalysts in Supercritical Water”

11:30-11:40 Break

Chair: Bunsho Ohtani

O-27 11:40 - 12:10 **Seiichi Taguchi** (Hokkaido Univ., Japan)  
“The Complete Bioprocess of Polymers Based on Enzyme Evolution”

O-28 12:10 - 12:50 **Victor S. -Y. Lin** (Iowa State Univ., USA)  
“Multifunctional Mesoporous Catalysts for Selective Conversions of Biological Feedstocks to Biodiesel and Ethanol”

12:50 - 12:55 **Closing Remarks**

**Prof. Atsushi Fukuoka** (CRC, Hokkaido Univ.)

## Poster Session

1. Toshiaki Hanaoka (AIST, Japan)  
"Bench-scale Production of Liquid Fuel Using Syngas Derived from Woody Biomass".
2. Takashi Tsuchida, Jun Kubo, Tetsuya Yoshioka, Shuji Sakuma, Tatsuya Takeguchi and Wataru Ueda (Sangi Co., Ltd.; Hokkaido University)  
"Influence of Acidity and Basicity of Hydroxyapatite Catalyst on the Reaction of Ethanol"
3. Leong Chean-Ring, Sung-Jin Jo, Ken'ichiro Matsumoto, Toshihiko Ooi, and Seiichi Taguchi (Hokkaido University)  
"Biosynthesis of Biodegradable Polyester from Renewable Carbon Sources by Genetically Engineered *Corynebacterium Glutamicum*"
4. Chi-Chang Lin, Ying-Mei Yang and Hsien-Chang Chang (National Cheng Kung University, Taiwan)  
"Raman Discrimination of Helicobacter Pylori Fingerprint in Dielectrophoresis Chip"
5. Mitsumasa Osada, Norihito Hiyoshi, Aritomo Yagaguchi, Osamu Sato, and Masayuki Shirai (Ichinoseki College; AIST)  
"Regeneration of Sulfur-Poisoned Supported Ruthenium Catalyst in Subcritical Water"
6. Aritomo Yamaguchi, Norihito Hiyoshi, Osamu Sato, Kyoko K. Bando, and Masayuki Shirai (Ichinoseki College; AIST)  
"Regeneration of Sulfur-Poisoned Supported Ruthenium Catalyst in Subcritical Water"
7. Yasuyoshi Iwase, Toru Koyama, Akimitsu Miyaji, Koji Inazu and Toshihide Baba (Tokyo Institute of Technology)  
"Selective Conversion of Ethene to Propene over H+-exchanged Zeolites"
8. Tasuku Komanoya, Mizuho Watanabe, Kenji Hara and Atsushi Fukuoka (Hokkaido University),  
"Cellulose Conversion to Soluble Sugars by Supported Metal Catalysts"
9. Satoru Takakusagi, Kotaro Miyazaki, Naoki Watanabe, Wang-Jae Chun, Yuichiro Koike, Masaharu Nomura, Kaoru Ijima and Kiyotaka Asakura (Hokkaido University)  
"Polarization Dependent Total-Reflection Fluorescence (PTRF) XAFS Study on Structure of Au Nanoclusters on TiO<sub>2</sub>(110) surface"
10. Satoshi Funai, Yumi Sato, Teruoki Tago, Takao Masuda (Hokkaido University)  
"Selective Production of Acetone from Livestock Excrement-derived Black Water Using FeOX Catalyst"
11. Y. Sato, K. Yoshioka, M. Tanaka, T. Murakami, and O. Niwa (AIST)  
"Protein-resistant Surface Prepared with Oligo(ethylene glycol) Alkanethiolate Monolayer"
12. Hisako Sato, Kayako Hori, Takara Sakurai and Akihiko Yamagishi (The University of Tokyo and PRESTO, JST)  
"Chiral Transfer in a Gel: Vibration Circular Dichroism Spectra of R- and S-12-Hydroxyoctadecanoic Acid Gels"
13. Shengjun Huang, Kenji Hara, Tadashi Oshio, Atsushi Fukuoka (Hokkaido University)  
"PROX Reaction by Platinum Nanoparticle Catalysts Supported on Mesoporous Silica"
14. H. Tsunoyama, N. Ichikuni, H. Sakurai, T. Tsukuda (Hokkaido University)  
"On the Origin of Size-specific Catalytic Activity of PVP-stabilized Gold Clusters for Aerobic Oxidation Reactions in Water"

15. Kohei Nogami, Fumiaki Amano and Bunsho Ohtani (Hokkaido University)  
"Photocatalytic Oxidative Decomposition of Gaseous Acetaldehyde over Visible Light-Responsive Bismuth Tungstate Photocatalyst"
16. S. Sato, M. G. Moula, H. Niimi, S. Suzuki, K. Irokawa, H. Kuroda and K. Asakura (Hokkaido University)  
"A possible Control for the Reaction Pathways of C<sub>2</sub>H<sub>5</sub>OH Oxidation Reaction by Using a Tunable Infrared Laser"
17. Koji Inazu, Zhixiong You, Ken-ichi Aika, Toshihide Baba (Numazu National College of Technology)  
"Novel Supported Ruthenium Catalyst for Ammonia Synthesis Using Barium Hexaaluminate as Support"
18. M. Yamauchi and T. Tsukuda (Hokkaido University)  
"Production and Catalytic Properties of CuPd Ordered-Alloy Nanoparticles"
19. Shuichi Koso, Kimio Kunimori, Keiichi Tomishige (University of Tsukuba)  
"Synthesis of Chemical Products from Biomass-derived Compounds Using Hydrogenolysis Catalysts"
20. Shenyong Ren, Eri Igarashi, Kiyohiko Nakajim, Ken-ichiro Kanno and Tamotsu Takahashi (Hokkaido University)  
"Coupling of Cp or Indenyl Ligands with Diene Moieties of Bis(cyclopentadienyl)- or Bis(indenyl)zirconacyclopentadienes"
21. Shi Li, Ken-ichiro Kanno, Kiyohiko Nakajim and Tamotsu Takahashi (Hokkaido University)  
"Synthesis and Dimerization Behavior of Symmetrically-Substituted Pentacenes via Zirconium-Mediated Double Ring Extension"
22. Ryu Abe (Hokkaido University)  
"Platinized Tungsten Oxide: A Highly Active Visible-light Responsive Photocatalyst"
23. Yusuke Waki, Hidenori Noguchi, and Kohei Uosaki (Hokkaido University)  
"Characterization of Interfacial Water Structure at Thermo-responsive Polymer Surface Studied by SFG Spectroscopy"
24. Tatsuhiko Adachi, Hidenori Noguchi, Akiko Nakatomi, Michio Yazawa, and Kohei Uosaki (Hokkaido University)  
"Structure and Function of Calmodulin Immobilized on Solid Substrate Studied by *in situ* ATR-IR and SFG Spectroscopies"
25. Huijin Liu, Yujin Tong, Masatoshi Osawa and Shen Ye (Hokkaido University)  
"Condensation Effect of DPPC on Surfactant DOMA Monolayer Studied by Sum Frequency Generation (SFG) Spectroscopy"
26. Na Li, Yujin Tong, Huijin Liu Masatoshi Osawa and Shen Ye (Hokkaido University)  
"Phase Transition in Hybrid Bilayer Membranes Studied by Sum Frequency Generation (SFG) Spectroscopy"
27. Yujin Tong, Yanbao Zhao, Masatoshi Osawa and Shen Ye (Hokkaido University)  
"Interference Effect in SFG Spectra for the Thin Film Sample"
28. Yi Zhang, Yanbao Zhao, Masatoshi Osawa and Shen Ye (Hokkaido University)  
"*In situ* Monitoring of Lipid Vesicle Fusion on Electrode Surface"



29. Akira Yamakata and Masatoshi Osawa (Hokkaido University)  
“Dynamics of Water Molecules on Electrochemical Interfaces”