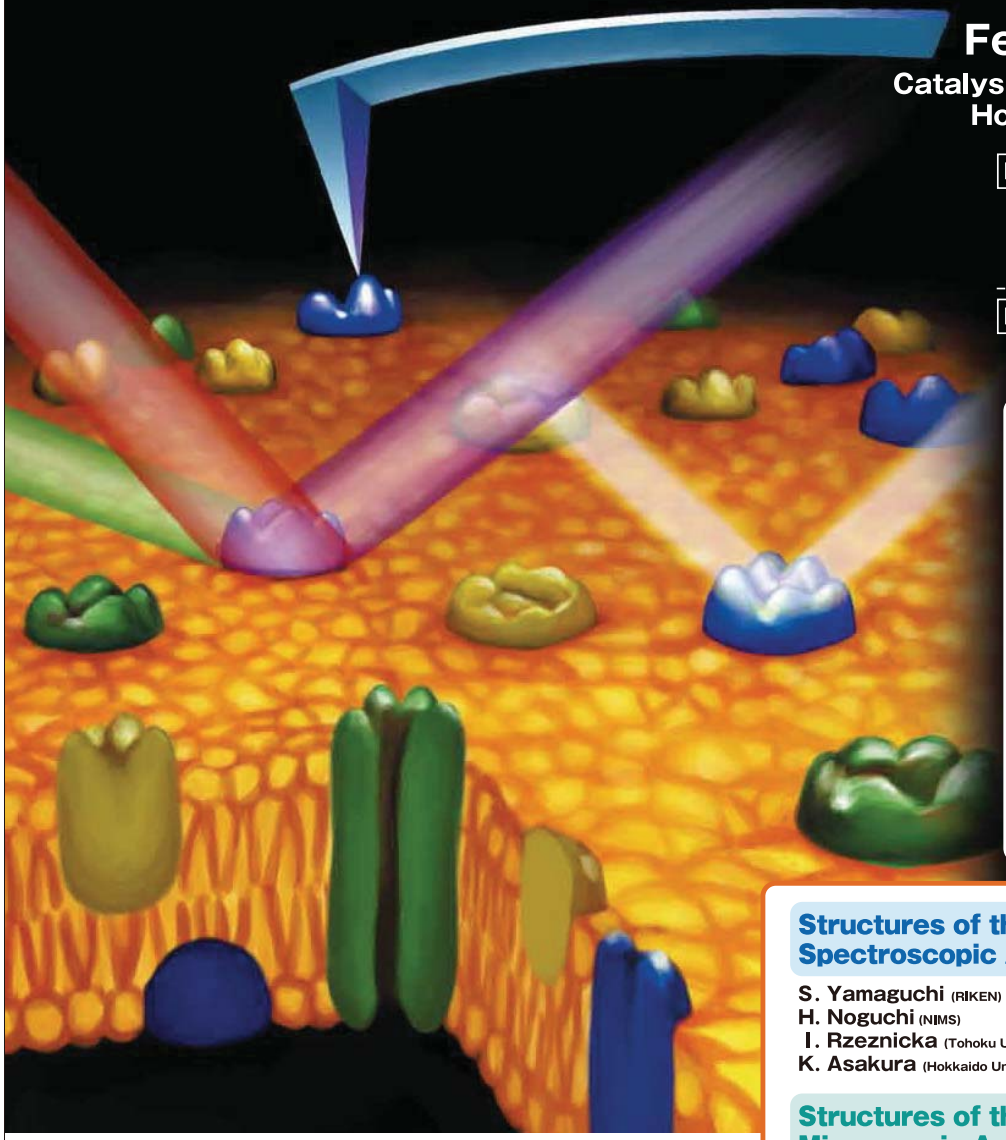
北海道大学触媒化学研究センター国際シンポジウム

CRC International Symposium

New Challenges on the Bio-interfaces: Structures and Dynamics

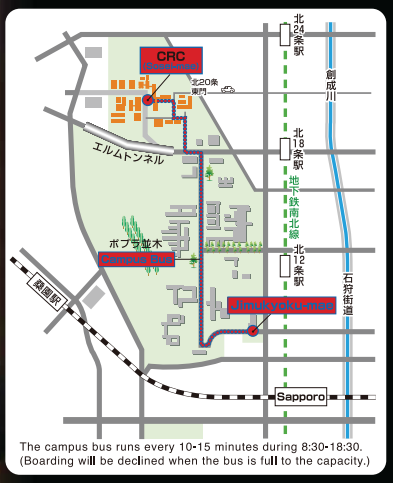


February 5-6, 2013

Catalysis Research Center (CRC), Hokkaido University, Japan

February 5
12:00～ Registration
12:50～ Open Ceremony
13:00～ Oral
18:00～ Poster Session
19:00～ 20:30 Banquet

February 6
9:00～ Oral
15:20～ CRC Lab Tour



The campus bus runs every 10-15 minutes during 8:30-18:30.
(Boarding will be declined when the bus is full to the capacity.)

Plenary Speakers

Prof. M. Kawai
(RIKEN; Univ. of Tokyo)

Prof. Y. R. Shen
(UC Berkeley)

Prof. P. Cremer
(Penn State Univ.)

Structures of the Bio-interface: Spectroscopic Approach

S. Yamaguchi (RIKEN)
H. Noguchi (NIMS)
I. Rzeznicka (Tohoku Univ.)
K. Asakura (Hokkaido Univ.)
N. Ohta (Hokkaido Univ.)
K. Murakoshi (Hokkaido Univ.)
S. Ye (Hokkaido Univ.)

Structures of the Bio-interface: Microscopic Approach

H. Onishi (Kobe Univ.)
H. Yamada (Kyoto Univ.)
T. Matsue (Tohoku Univ.)
T. Fukuma / H. Asakawa (Kanazawa Univ.)
T. Kawai (NAIST)
R. Tero (Toyohashi Univ. of Tech.)
K. Hosokawa (RIKEN)

Design of the Bio-interface: Creating Novel Biomaterials

H. Imahori (Kyoto Univ.)
N. Yui (Tokyo Medical and Dental Univ.)
M. Matsusaki (Osaka Univ.)
M. Abe (Kyushu Univ.)
X. Wan (Peking Univ.)
K. Ijiro (Hokkaido Univ.)
J. P. Gong (Hokkaido Univ.)
T. Nakano (Hokkaido Univ.)
E. Kowalska (Hokkaido Univ.)

Conference venue: CRC, Hokkaido University, N-21, W-10, Kita-ku, Sapporo 001-0021, Japan
Oral & Registration: Conference Room (Sousei building 5th floor)
Poster & Banquet: Science Plaza (Sousei Building 2nd Floor)

Organization Committee: Dr. Shen Ye (Chair), E-mail: ye@cat.hokudai.ac.jp, Tel: 011-706-9146 (Secretary)

北海道大学触媒化学研究センター
国際シンポジウム

International Symposium of
Catalysis Research Center (CRC),
Hokkaido University

New Challenges on the Bio-interfaces

−Structures and Dynamics−

～バイオインターフェースでの新しい挑戦～

February 5-6, 2013

Catalysis Research Center (CRC),
Hokkaido University
Sapporo, Japan

Conference Venue:
CRC, Hokkaido University, N-21 W-10, Kita-ku, Sapporo 001-0021, Japan
Conference Room (Sousei Building 5th Floor): Registration and Oral Presentations
Science Plaza (Sousei Building 2nd Floor): Poster Presentations and Banquet

Organization Committee: Dr. Shen Ye (Chair)

Contact: CRC, Hokkaido University, Japan. E-mail: ye@cat.hokudai.ac.jp Tel: 011-706-9126

主催： 北海道大学　触媒化学研究センター

共催： 日本化学会 北海道支部
日本分析化学会 北海道支部
電気化学会 北海道支部
高分子学会 北海道支部
文科省科研費 新学術領域「配位プログラム」（領域 **2107**）

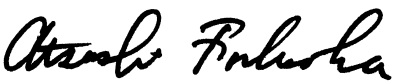
Preface from the Director of CRC

On the occasion of the CRC International Symposium on Biointerfaces, I would like to say a few words. Our objective at the CRC is to promote fundamental research on catalysis and contribute to researchers in this field. To this end, our faculty members are powerfully advancing their original and collaborative research with novelty and originality. In addition, we have been performing a program called the “Joint Usage and Research Center”, which allows us to contribute to researchers from outside, not only through collaboration but also through dispersal of information from our side. Moreover, we have been doing a joint program to create a new field of synthetic and catalytic chemistry and to encourage young scientists to develop independent research projects. To reinforce the background of catalytic chemistry, the present CRC international Symposium has been planned by Dr. Ye, and I hope to have an animated discussion in the Symposium.

February 2013

Director of Catalysis Research Center

Atsushi FUKUOKA



Program

February 5 (Tue.)

12:50 – 13:00	**Atsushi Fukuoka** CRC, Hokkaido Univ.	**Open Remarks**	
Chair, Masatoshi Osawa			
13:00 – 13:30	**Y. R. Shen** Univ. of California	*Probing Ions Emerging at Water Interfaces by Sum-Frequency Vibrational Spectroscopy*	**1**
Chair, Kiyotaka Asakura			
13:30 – 13:50	**Shoichi Yamaguchi** RIKEN	*Interface-Selective Heterodyne-Detected Second-Order Nonlinear Spectroscopy*	**3**
13:50 – 14:10	**Izabela Rzeznicka** Tohoku Univ.	*Sum-Frequency Generation Study of the Hydration of Phospholipid Monolayers in the Presence of Antimicrobial Peptides*	**5**
14:10 – 14:30	**Hidenori Noguchi** NIMS	*Interfacial Molecular Structure at Bio-Nanointerfaces Studied by Surface Sensitive Vibrational Spectroscopies*	**7**
14:30 – 14:50	**Ryugo Tero** Toyohashi Univ. of Tech.	*Artificial Lipid Membranes on Graphene Oxide and Reduced Graphene Oxide*	**9**
14:50 – 15:10	**Shen Ye** CRC, Hokkaido Univ.	*Enzyme Catalyzed Hydrolysis of the Supported Lipid Bilayers Probed by SFG and AFM*	**11**
15:10 – 15:30	**Coffee Break**		
Chair, Wataru Ueda			
15:30 – 16:00	**Maki Kawai** RIKEN; Univ. of Tokyo	*Single Molecular Level Imaging and Spectroscopy of Molecules at Interfaces*	**13**
Chair, Kenji Hara			
16:00 – 16:20	**Kei Murakoshi** Hokkaido Univ.	*Manipulation of a Small Number of Molecules at Ultra Small Space*	**15**
16:20 – 16:40	**Kiyotaka Asakura** CRC, Hokkaido Univ.	*Polarization Dependent Fluorescence X-ray Absorption Fine Structure Studies on the Metal Species at the Interface of Organic Molecule: Its Possibility to the Application of Bio-interface*	**17**
16:40 – 17:00	**Nobuhiro Ohta** Hokkaido Univ.	*Electric Field Effects on Dynamics and Function in Photoscience*	**19**
Chair, Kenich Shimizu			
17:00 – 17:20	**Tamaki Nakano** CRC, Hokkaido Univ.	*Polymer Chirality in Excited States*	**21**
17:20 – 17:40	**Tsuyoshi Kawai** NAIST	*Evaluation of Optical Chirality of Molecular Materials in Small Area Based on Circularly Polarized Luminescence Microscope*	**23**
17:40 – 18:00	**Kazuo Hosokawa (RIKEN)**	*Medical Tests Power-Free Microfluidic Device for Point-of-Care*	**25**
18:00 – 19:00	**Poster Session**		
19:00 – 20:30	**Banquet**		

February 6 (Wed.)

Chair, Bunsho Ohtani			
9:00 – 9:30	**Paul Cremer** Penn State Univ.	*Exploring Ion Interactions at Interfaces*	**27**
9:30 – 9:50	**Tomokazu Matsue** Tohoku Univ.	*Non-Contact and High-Resolution Bioimaging with Scanning Electrochemical Microscopy*	**29**
9:50 – 10:10	**Hirofumi Yamada** Kyoto Univ.	*Molecular-Scale Biological Interactions in Liquids Investigated by Atomic Force Microscopy*	**31**
10:10 – 10:30	**Takeshi Fukuma** Kanazawa Univ.	*3D Scanning Force Microscopy for Subnanometer- Scale Investigations on Biological Interfaces*	**33**
10:30 – 10:50	**Coffee Break**		
Chair, Jun-ya Hasegawa			
10:50~11:10	**Hiroshi Onishi** Kobe Univ.	*Interfacial Liquids over Soft Materials, an AFM Study*	**35**
11:10 – 11:30	**Hiroshi Imahori** Kyoto Univ.	*Integration of Chemistry and Biology by Light*	**39**
11:30 – 11:50	**Kuniharu Ijiro** Hokkaido Univ.	*Control of Self-Assembly of Nanoparticles for Optical and Bio Applications*	**41**
11:50 – 12:10	**Masaaki Abe** Kyushu Univ.	*A Trimetallic Modular Approach to Redox-Active Supramolecular Ring Clusters*	**43**
12:20 – 13:20	**Luncheon** (4th Floor, Room B&C)		
Chair, Masamichi Ogasawara			
13:30~13:50	**Nobuhiko Yui** Tokyo Medical and Dental Univ.	*Hydrated Molecular Mobility at Supramolecular Surfaces Dominates the Fate of Cellular Adhesion*	**45**
13:50 – 14:10	**Jian Ping Gong** Hokkaido Univ.	*Friction and Lubrication of Hydrogel -Towards its Relevance to Bio-Lubrication*	**47**
14:10 – 14:30	**Xinhua Wan** Peking Univ.	*Helix-Sense-Selective Polymerization of Vinyl Aromatics*	**49**
14:30 – 14:50	**Ewa Kowalska** CRC, Hokkaido Univ.	*Plasmonic Photocatalysts for Environmental Application*	**51**
14:50 – 15:10	**Michiya Matsusaki** Osaka Univ.	*Control of Cell Membrane Interfaces Using Polymer / Protein Nanofilms for Tissue Engineering Applications*	**55**
15:10 – 15:20	**Masatoshi Osawa** CRC, Hokkaido Univ.	**Closing Remarks**	
15:30 –	**CRC Lab Tour**		

February 5 (Tuesday)

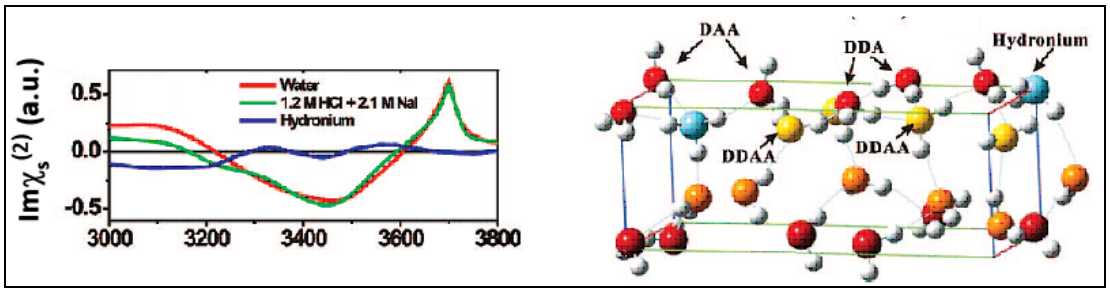
12:00~ **Registration**

12:50~13:00 **Opening Address**: **Atsushi Fukuoka** (Director, CRC, Hokkaido University)

Chairperson: **Masatoshi Osawa**

13:00~13:30 **Y. R. Shen** (Univ. of California, Berkeley)

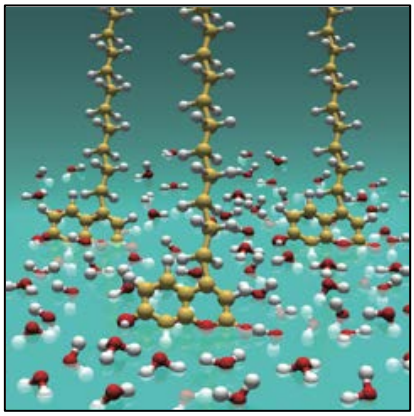
Probing Ions Emerging at Water Interfaces by Sum-Frequency Vibrational Spectroscopy



Chairperson: **Kiyotaka Asakura**

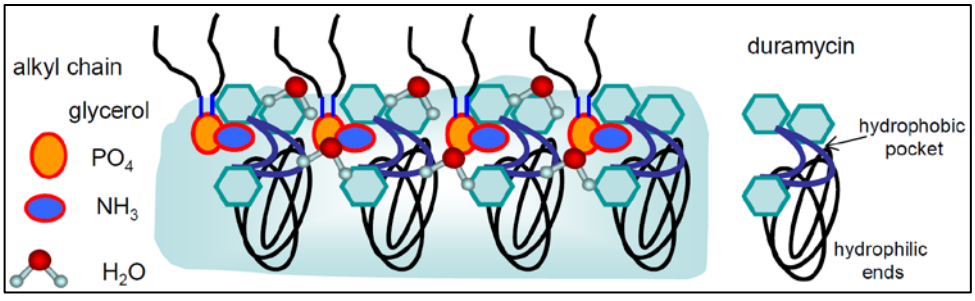
13:30~13:50 **Shoichi Yamaguchi** (RIKEN)

Interface-Selective Heterodyne-Detected 2nd-Order Nonlinear Spectroscopy



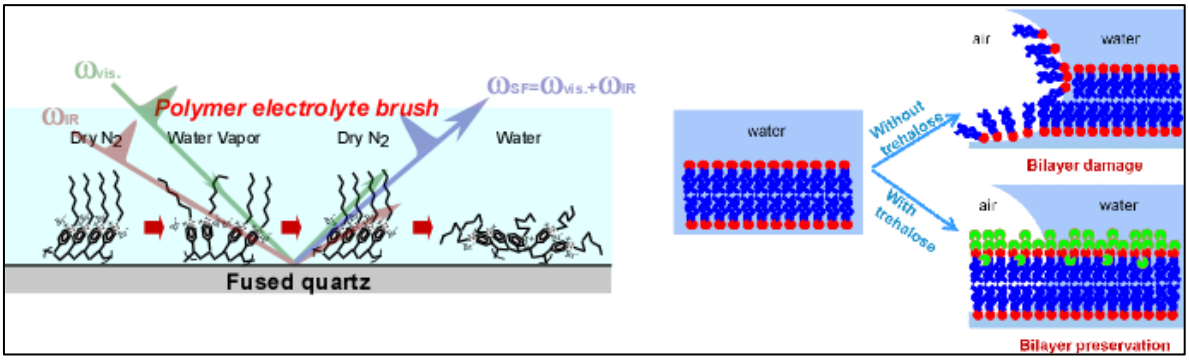
13:50~14:10 **Izabela Rzeznicka** (Tohoku Univ.)

Sum-Frequency Generation Study of the Hydration of Phospholipid Monolayers in the Presence of Antimicrobial Peptides



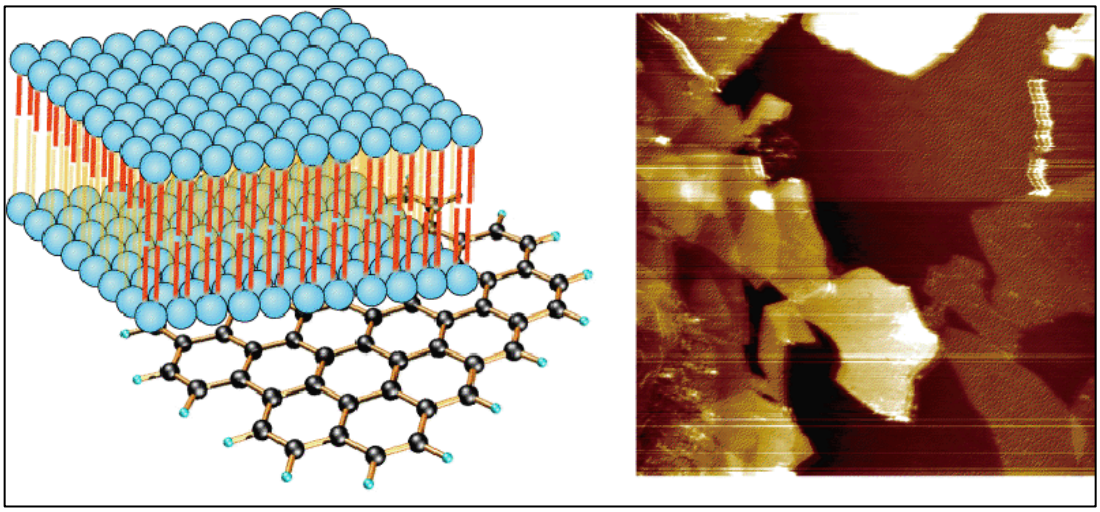
14:10~14:30 **Hidenori Noguchi** (NIMS)

Interfacial Molecular Structure at Bio-Nanointerfaces Studied by Surface Sensitive Vibrational Spectroscopies



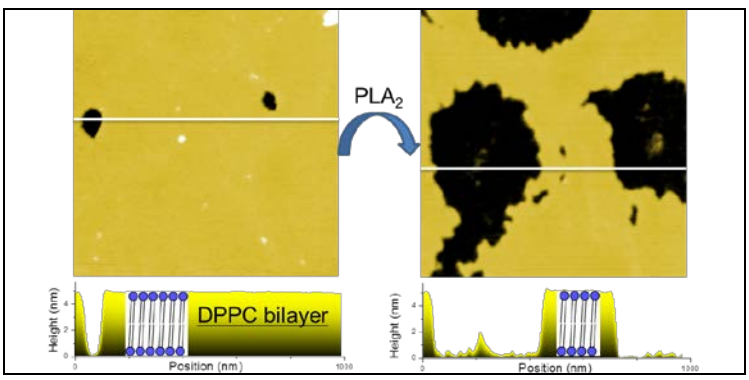
14:30~14:50 **Ryugo Tero** (Toyohashi Univ. of Tech.)

Artificial Lipid Membranes on Graphene Oxide and Reduced Graphene Oxide



14:50~15:10 **Shen Ye** (Hokkaido Univ.)

Enzyme Catalyzed Hydrolysis of the Supported Lipid Bilayers Probed by SFG and AFM

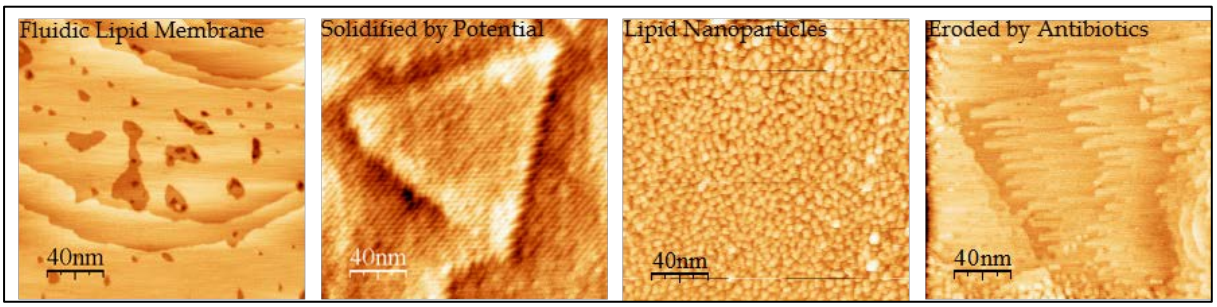


15:10~15:30 **Coffee Break**

Chairperson: **Wataru Ueda**

15:30~16:00 **Maki Kawai** (RIKEN; Univ. of Tokyo)

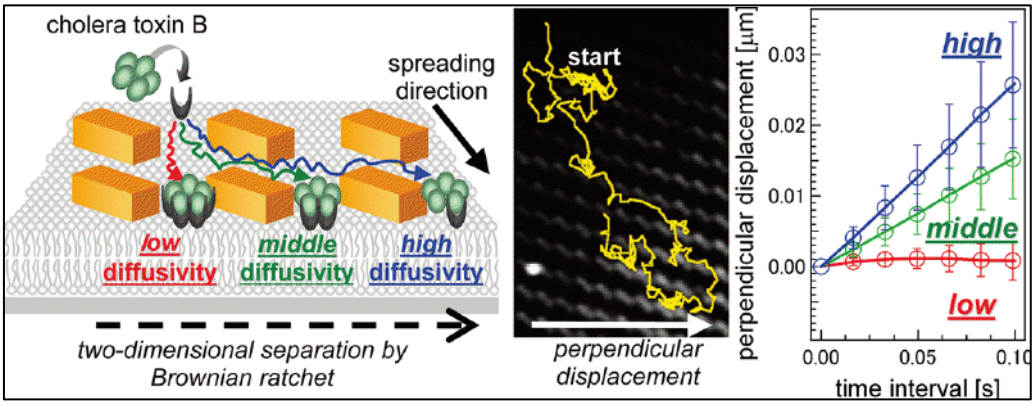
Single Molecular Level Imaging and Spectroscopy of Molecules at Interfaces



Chairperson: **Kenji Hara**

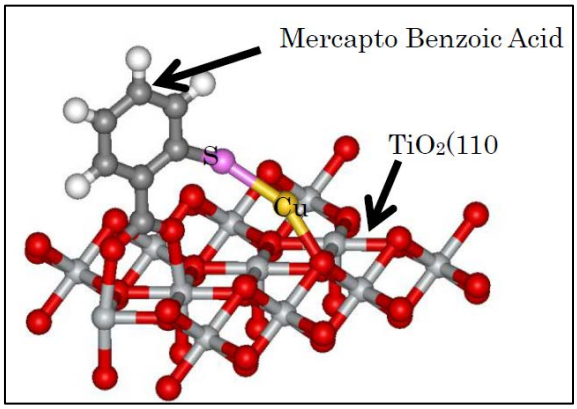
16:00~16:20 **Kei Murakoshi** (Hokkaido Univ.)

Manipulation of a Small Number of Molecules at Ultra Small Space



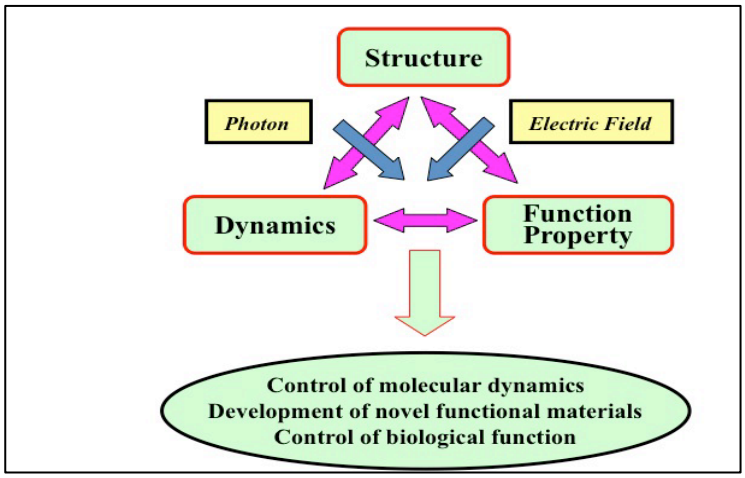
16:20~16:40 **Kiyotaka Asakura** (Hokkaido Univ.)

Polarization Dependent Fluorescence X-ray Absorption Fine Structure Studies on the Metal Species at the Interface of Organic Molecule: Its Possibility to the Application of Bio-interface



16:40~17:00 **Nobuhiro Ohta** (Hokkaido Univ.)

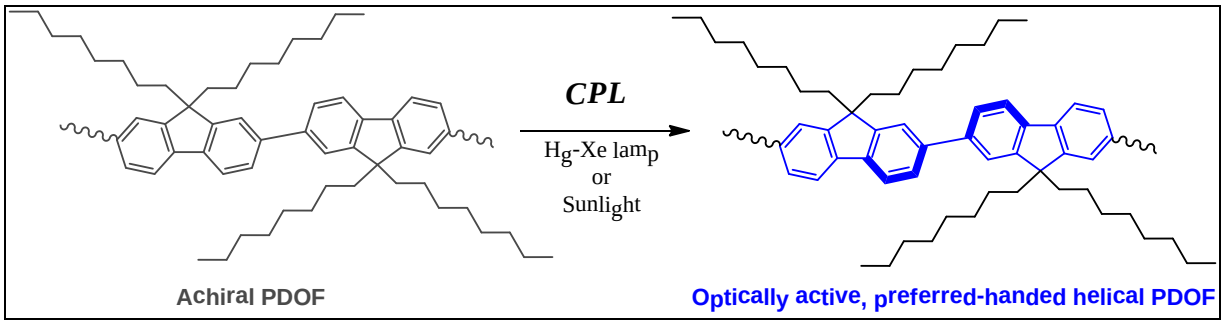
Electric Field Effects on Dynamics and Function in Photoscience



Chairperson: **Kenich Shimizu**

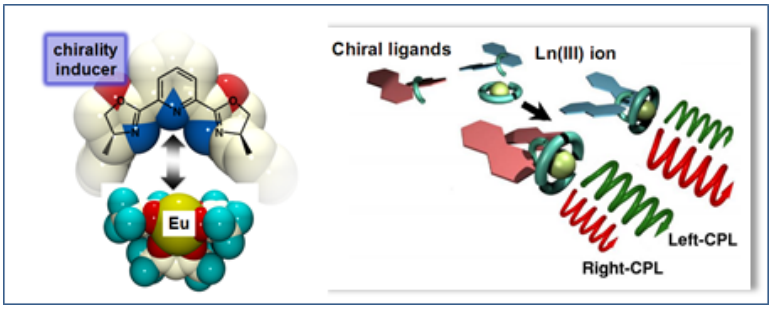
17:00~17:20 **Tamaki Nakano** (Hokkaido Univ.)

Polymer Chirality in Excited States



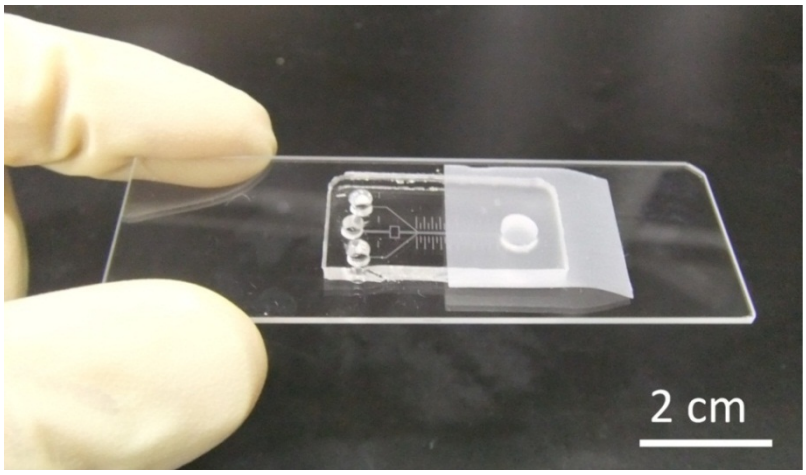
17:20~17:40 **Tsuyoshi Kawai** (NAIST)

Evaluation of Optical Chirality of Molecular Materials in Small Area Based on Circularly Polarized Luminescence Microscope



17:40-18:00 **Kazuo Hosokawa** (RIKEN)

Power-Free Microfluidic Device for Point-of-Care Medical Tests



18:00~19:00 **Poster Session** (Science Plaza, 2F)

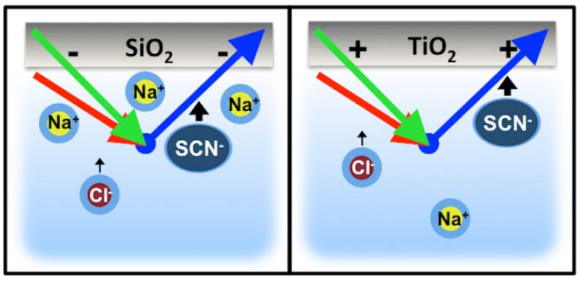
19:00~20:30 **Banquet** (Science Plaza, 2F)

February 6 (Wednesday)

Chairperson: **Bunsho Ohtani**

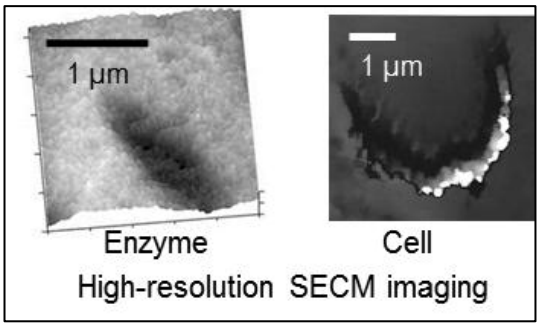
9:00~9:30 **Paul Cremer** (Penn State Univ.; Texas A&M Univ.)

Exploring Ion Interactions at Interfaces



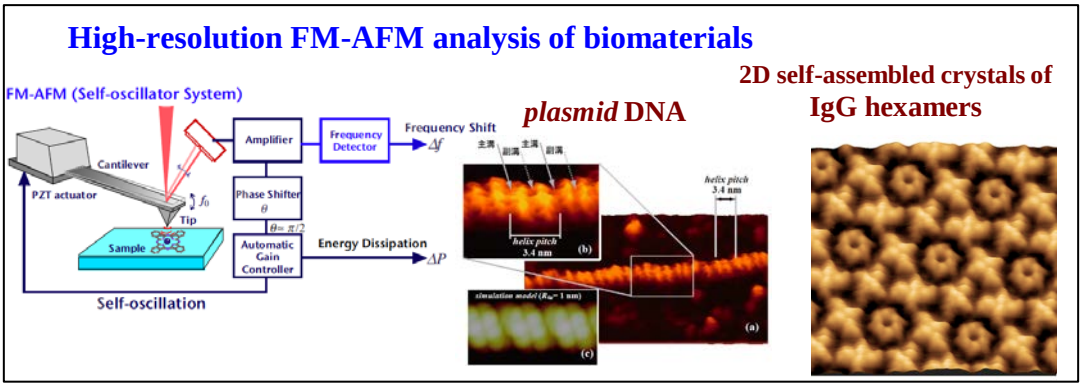
9:30~9:50 **Tomokazu Matsue** (Tohoku Univ.)

Non-Contact and High-Resolution Bioimaging with Scanning Electrochemical Microscopy



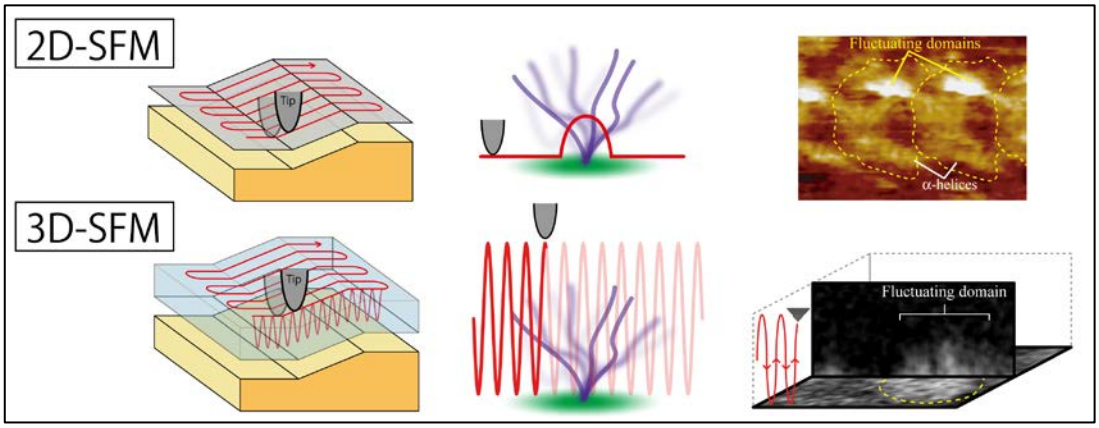
9:50~10:10 **<u>Hirofumi Yamada</u>** (Kyoto Univ.)

Molecular-Scale Biological Interactions in Liquids Investigated by Atomic Force Microscopy



10:10~10:30 **Takeshi Fukuma** and **<u>Hitoshi Asakawa</u>** (Kanazawa Univ.)

3D Scanning Force Microscopy for Subnanometer-Scale Investigations on Biological Interfaces

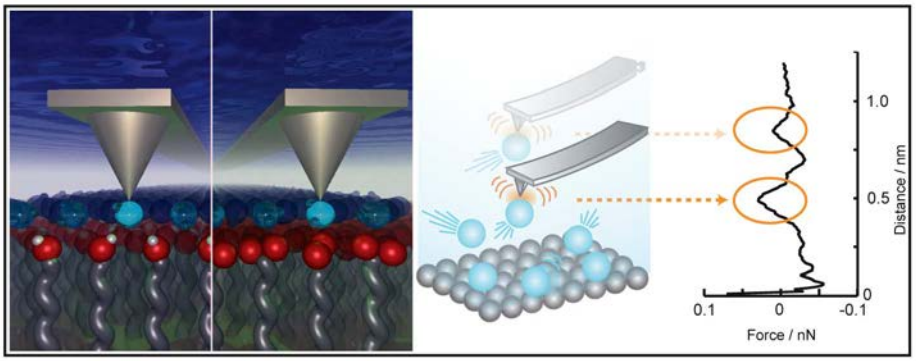


10:30~10:50 **Coffee Break**

Chairperson: **Jun-ya Hasegawa**

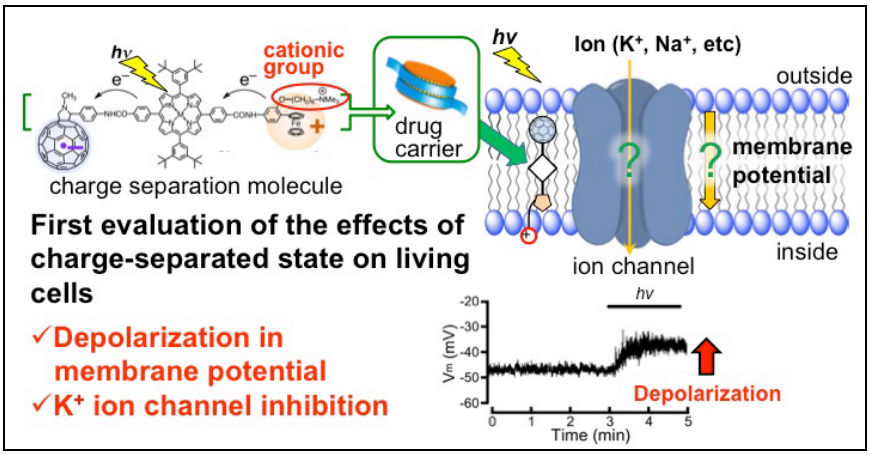
10:50~11:10 **<u>Hiroshi Onishi</u>** (Kobe Univ.)

Interfacial Liquids over Soft Materials, an AFM Study



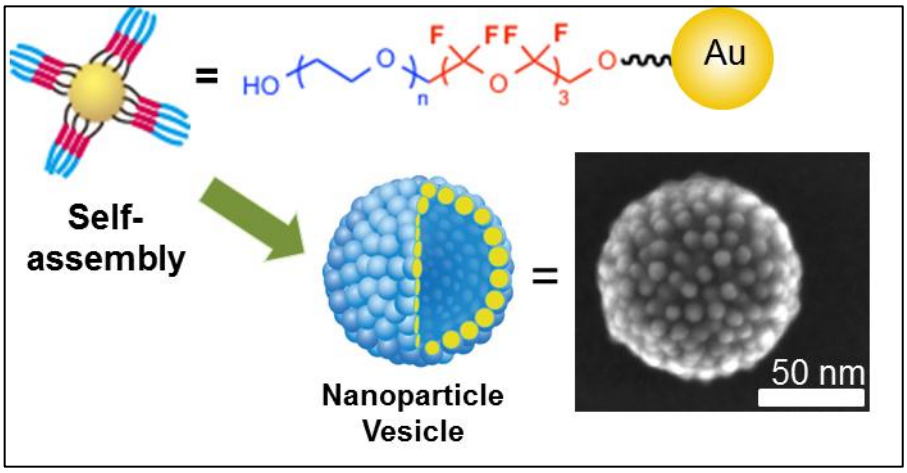
11:10~11:30 **Hiroshi Imahori** (Kyoto Univ.)

Integration of Chemistry and Biology by Light



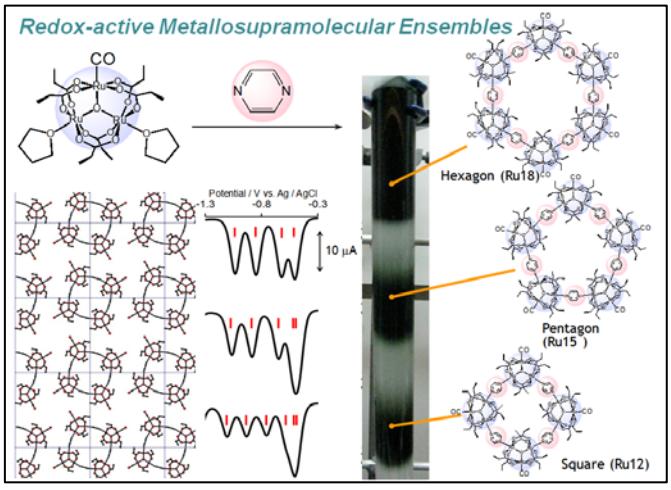
11:30-11:50 **Kuniharu Ijiro** (Hokkaido Univ.)

Control of Self-Assembly of Nanoparticles for Optical and Bio Applications



11:50~12:10 **Masaaki Abe** (Kyushu Univ.)

A Trimetallic Modular Approach to Redox-Active Supramolecular Ring Clusters

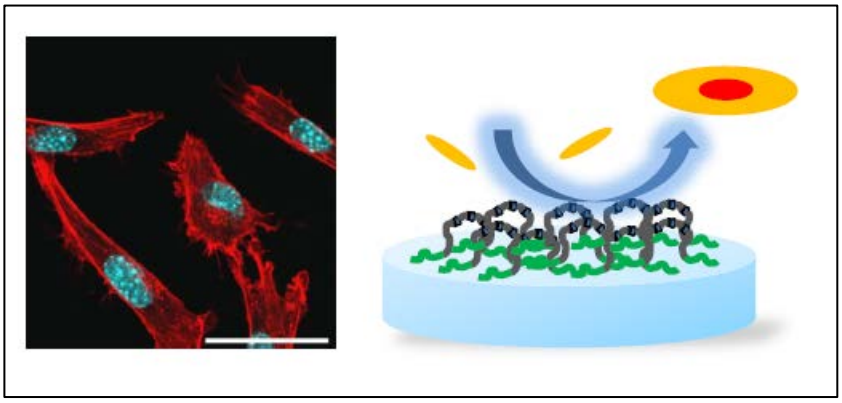


12:20~ 13:20 **Luncheon** *(CRC Staff and Invited Speakers: 4th Floor, Seminar Room B&C)*

Chairperson: **Masamichi Ogasawara**

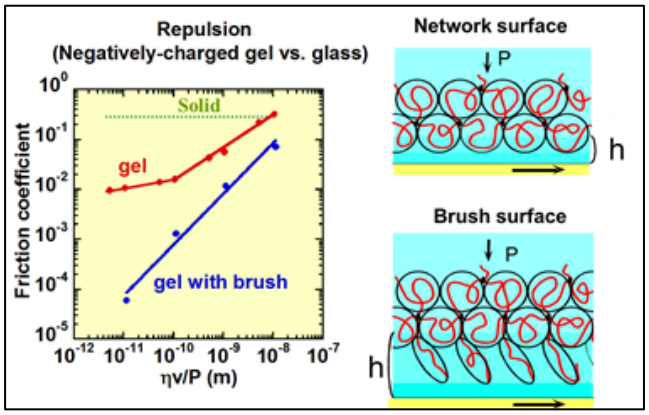
13:30~13:50 **Nobuhiko Yui** (Tokyo Medical and Dental Univ.)

Hydrated Molecular Mobility at Supramolecular Surfaces Dominates the Fate of Cellular Adhesion



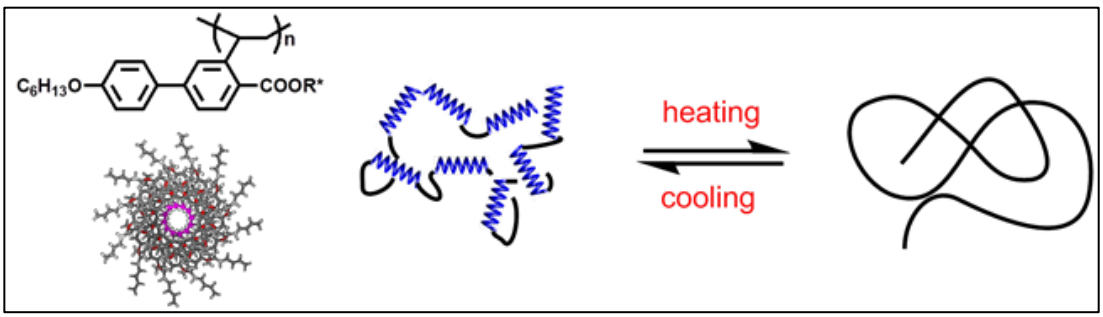
13:50~14:10 **Jian Ping Gong** (Hokkaido Univ.)

Friction and Lubrication of Hydrogel -Towards its Relevance to Bio-Lubrication



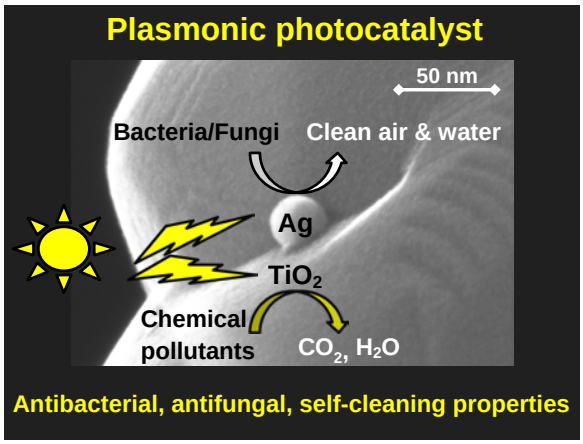
14:10~14:30 **Xinhua Wan** (Peking Univ.)

Helix-Sense-Selective Polymerization of Vinyl Aromatics



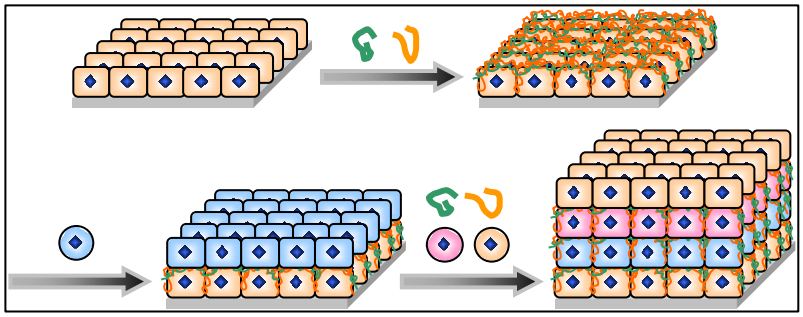
14:30~14:50 **Ewa Kowalska** (Hokkaido Univ.)

Plasmonic Photocatalysts for Environmental Application



14:50~15:10 **Michiya Matsusaki** (Osaka Univ.)

Control of Cell Membrane Interfaces Using Polymer / Protein Nanofilms for Tissue Engineering Applications



15:10~15:20 **Closing Remarks:** Masatoshi Osawa (CRC, Hokkaido University)

15:30~ **CRC Lab Tour**

Poster Session

1. Electrostatic and quantum mechanical molecular interactions controlling excitation energies of photo-functional proteins, **J. Hasegawa**.
2. Stereoselective Synthesis of Pipecolinic Acid Using a Hollow Core-Shell Silica-Titania Photocatalyst, **B. Ohtani**, S. Chandren.
3. Silver nanoparticles modified-paints, **J. Reszczynska**, A. Zielinska-Jurek, I. Lacka, A. Zaleska.
4. Low Temperature Elimination of Ethylene over Pt Nanoparticles Supported on Mesoporous Silica, **C. Jiang**, K. Hara, A. Fukuoka.
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