

# International Symposium on Molecular and System Life Sciences

**Project Leader** Dr. Koji Kaya (RIKEN Advanced Science Institute (ASI))

**December 10-11, 2008**

**RIKEN Center for Developmental Biology,  
Kobe, Japan**

The RIKEN CDB Campus

## ■ Organizing Committee

RIKEN

Koji Kaya, Yoshihito Osada, Maki Kawai,  
Tatsuo Wada, Toshihide Kobayashi

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Osaka Univ. Toshio Yangida, Tomoji Kawai

Kyushu Univ. Sunao Yamada, Atsushi Takahara

## ■ RIKEN Advanced Science Institute (ASI)

co-held with

Osaka Univ. Global COE Program "System Dynamics of Biological Function"

Kyushu Univ. Global COE Program "Science for Future Molecular Systems"

Hokkaido Univ. Global COE Program "Catalysis as the Basis for Innovation in Materials"

## ■ Invited Speakers

**Prof. Paul R. Selvin (Univ. of Illinois, USA)**

**Prof. Bing Xu (Brandeis Univ., USA, The Hong Kong Univ.)**

**Prof. Mischa Bonn (FOM-Institute for Atomic and  
Molecular Physics, Netherlands)**

**Prof. Dongyuan Zhao (Fudan Univ., China)**

**Prof. Takanori Ichiki (The Univ. of Tokyo, Japan)**

**Dr. Hiroki R. Ueda (RIKEN CDB, Japan)**

## Contact

T. Kobayashi (kobayasi@riken.jp), TEL 048-467-9534, FAX 048-467-9535

T. Wada (tatsuow@riken.jp), TEL 048-467-9380, FAX 048-462-4647

**Molecular-Infomational Life Science Research Group**

**RIKEN Advanced Science Institute (ASI)**

**2-1 Hirosawa, Wako, Saitama 351-0198, JAPAN**



# *International Symposium on Molecular and System Life Sciences*

December 10-11, 2008  
RIKEN Center for Developmental Biology, Kobe, JAPAN

## Symposium Program

**Oral Presentation: Auditorium (C Building 1st Floor)**

**Poster Presentation: Exhibition Hall (C Building 1st Floor)**

### Time Table

<b>Wednesday Dec.10</b>	<b>Thursday Dec.11</b>
10:00 <b>Opening Remarks</b> <b>Koji KAYA</b>	10:00-10:20 <b>Masahiko HARA</b> 10:20-10:40 <b>Toshio YANAGIDA</b> 10:40-11:00 <b>Yasuro NIIDOME</b>
10:10-11:00 <b>Paul R. SELVIN*</b> 11:00-11:50 <b>Bing XU*</b> 11:50-12:10 <b>Tomoji KAWAI</b>	11:00-11:50 <b>Dongyuan ZHAO*</b> 11:50-12:10 <b>Kazuki SADA</b>
12:10-13:30 <b>Lunch</b>	12:10-13:30 <b>Lunch</b>
13:30-14:20 <b>Hiroki R. UEDA*</b> 14:20-14:40 <b>Kazuyasu SAKAGUCHI</b> 14:40-15:00 <b>Akira KAKUGO</b>	13:30-14:20 <b>Mischa BONN*</b> 14:20-14:40 <b>Taro YAMADA</b>
15:00-15:20 <b>Coffee Break</b>	14:40 <b>Closing Remarks</b> <b>Yoshihito OSADA</b>
15:20-16:10 <b>Takanori ICHIKI*</b> 16:10-16:30 <b>Yuji MIYAHARA</b> 16:30-16:50 <b>Masaru KATO</b>	
17:00-18:30 <b>Poster Session</b>	
18:30-19:50 <b>Banquet</b>	

\*Plenary Lecture

## Wednesday, December 10

- 10:00-10:10 **Opening Remarks**  
Koji Kaya (RIKEN)
- 10:10-11:00 **The Dynamics of Ionic Channel Gating Examined by LRET**  
Paul R. Selvin (Univ. of Illinois, USA) (Plenary Lecture)
- 11:00-11:50 **Enzyme Triggers Self-assembly and Hydrogelation for Controlling the Fate of Cells**  
Bing Xu (Brandeis Univ., USA, Hong Kong Univ.) (Plenary Lecture)
- 11:50-12:10 **Biological Processes Observed by Scanning Probe Microscopy**  
Tomoji Kawai (ISIR, Osaka Univ.)
- 12:10-13:30 **Lunch**
- 13:30-14:20 **Towards Synthesis of Mammalian Circadian Clocks**  
Hiroki R. Ueda (RIKEN CDB, Osaka Univ.) (Plenary Lecture)
- 14:20-14:40 **Functional Bionanofibrils based on Peptide Self-assembly**  
Hiroki Sakai, Yumiko Kobayashi, Yuta Asanomi, Xinjiang Chen, Takuya Masuda, Yoshiro Chuman, Kohei Uosaki, and Kazuyasu Sakaguchi (Hokkaido Univ.)
- 14:40-15:00 **Soft Biomachine based on Motor Proteins**  
Akira Kakugo, Kazuhiro Shikinaka, Ryuzo Kawamura, Hidemitsu Furukawa, and JianPing Gong (Hokkaido Univ., JST PRESTO)
- 15:00-15:20 **Coffee Break**
- 15:20-16:10 **One-to-One Gene-Encoded Functional Protein Microarray for High-Speed Molecular Evolution On A Chip**  
Takanori Ichiki, Manish Biyani, and Naoto Nemoto (CNBI Univ, of Tokyo, JST CREST, Saitama Univ.) (Plenary Lecture)
- 16:10-16:30 **Detection of Biomolecular Recognition Using Bio-transistor**  
Yuji Miyahara (Univ, of Tokyo, JST CREST)
- 16:30-16:50 **Development of a Silica-organic Hydrogel for High-throughput Screening**  
Masaru Kato (CNBI, Univ. of Tokyo)
- 17:00-18:30 **Poster Session**
- 18:30-19:50 **Banquet**

## Thursday, December 11

- 10:00-10:20 **AFM Studies of Single Molecular Detection and Molecular Recognition**  
Tomohiro Hayashi, Tong Wang, and Masahiko Hara (RIKEN, Tokyo Inst. Tech.)
- 10:20-10:40 **Single Molecule Nanoscience: Function and Life**  
Toshio Yanagida (Graduate School of Frontier Biosciences, Osaka Univ.)
- 10:40-11:00 **Photoinduced Release of Oligonucleotide from Silica-coated Gold Nanorods**  
Yasuro Niidome, Yukichi Horiguchi, and Takuro Niidome (Kyushu Univ.)
- 11:00-11:50 **Synthesis and Application of Ordered Mesoporous Polymer and Carbon Materials**  
Dongyuan Zhao (Fudan Univ., China) (Plenary Lecture)
- 11:50-12:10 **'Clickable' Metal Organic Frameworks**  
Kazuki Sada (Kyushu Univ.)
- 12:10-13:30 **Lunch**
- 13:30-14:20 **Water at Biological Membranes: Structure, Dynamics and Biomolecular Sensing**  
Mischa Bonn (FOM-Institute for Atomic and Molecular Physics, Netherlands)  
(Plenary Lecture)
- 14:20-14:40 **Scanning Tunneling Microscopic Visualization of Phospholipid Particle Fusion Induced by Duramycin**  
Taro Yamada (RIKEN)
- 14:40 **Closing Remarks**  
Yoshihito Osada (RIKEN)

## Poster Presentations

- P1 Development Mini-tetrapod Bone Fillers**  
Kazuyo Igawa, Takamasa Sakai, and Ung-il Chung (Univ. of Tokyo)
- P2 Development of Functionalized Nanofibrils Derived from Structure-controlled Amyloid Peptides**  
Yoshiro Chuman, Hiroki Sakai, Yuya Asanomi, Yumiko Kobayashi, Takuya Masuda, Kohei Uosaki, and Kazuyasu Sakaguchi (Hokkaido Univ.)
- P3 Aligned Peptide Fibrils as Templates to Orient Functional Nanomaterials**  
Xinjiang Chen, Yuya Asanomi, Yoshiro Chuman, Takuya Masuda, Kohei Uosaki, and Kazuyasu Sakaguchi (Hokkaido Univ.)
- P4 Mechanism of Anomalous Strength in Double-Network Gel: Observation of Localized Damaged Zone**  
Qui Ming Yu, Yoshimi Tanaka, Hidemitsu Furukawa, Takayuki Kurokawa, and Jian Ping Gong (Hokkaido Univ.)
- P5 Single Molecule Experiments of Molecular Bearing of Porphyrin Complexes**  
Hiroyuki Tanaka, Tomohiro Ikeda, Masayuki Takeuchi, Seiji Shinkai, and Tomoji Kawai (ISIR, Osaka Univ., Kyushu Univ., NIMS, Sojo Univ.)
- P6 Studies on Photoreactivity of an Amphiphilic Azobenzene under Localized Surface Plasmon Resonance**  
Ichiro Uechi, Ryuji Matsumoto, Tsuyoshi Muto, Tatsuo Wada, and Sunao Yamada (Kyushu Univ., RIKEN)
- P7 Accumulation of Histidine Tagged Protein to Sugar-SWNT Composites Bearing Metal Ligands**  
Youichi Tsuchiya, Sunao Yamada, and Seiji Shinkai (RIKEN, Kyushu Univ., ISIT)
- P8 Fabrication and Photoelectrochemistry of Metal Nanoparticle-Organic Nanosystems**  
Taichi Arakawa, Tsuyoshi Akiyama, and Sunao Yamada (Kyushu Univ.)
- P9 Spectral Properties of Polythiophenes in Supramolecular Confinement by Helical Schizophyllan**  
Shuichi Haraguchi, Yoichi Tsuchiya, Tomohiro Shiraki, Kota Sugikawa, Kazuki Sada, and Seiji Shinkai (Kyushu Univ., RIKEN, ISIT)
- P10 Reversible Formation and Characterization of Nanogels Cross-linked by Dynamic Covalent Bonds**  
Yoshifumi Amamoto, Moriya Kikuchi, Takeshi Maeda, Hiroyasu Masunaga, Sono Sasaki, Hideyuki Otsuka, and Atsushi Takahara (Kyushu Univ.)

- P11 Supramolecular Systems for Information Manipulation based on Collective Motion**  
Tsuyoshi Muto, Masuki Kawamoto, and Tatsuo Wada (Supramolecular Science Lab., RIKEN)
- P12 Adsorption Control of Amyloid Fibrils on Au(111) Surfaces Modified with Self-assembled Monolayers with Various Terminal Functional Groups**  
Masaya Tsukamoto, Satoru Takakusagi, Yoshiro Chuman, Kazuyasu Sakaguchi, Takuya Masuda, and Kohei Uosaki (Hokkaido Univ.)
- P13 Study on Formation Process and Structure of Polyproline SAM on Au(111)**  
Ying Han, Takashi Iwama, Tatsuhiko Adachi, Hidenori Noguchi, Kazuyasu Sakaguchi, and Kohei Uosaki (Hokkaido Univ.)
- P14 Lipid Membrane and Liposomes Supported on a Flat Gel Substrate Observed by Atomic Force Microscopy**  
Akihiko Takagi, Hitomi Hokonohara, and Tomoji Kawai (RIKEN, ISIR, Osaka Univ.)
- P15 Immobilization of IL-6 and IL-6 Receptor at N-terminal on a Substrate for AFM Force Measurements**  
Hitomi Hokonohara, Akihiko Takagi, Toshihiko Matsuura, Takuya Matsumoto, and Tomoji Kawai (ISIR, Osaka Univ., RIKEN)
- P16 Probing Interaction of Antimicrobial Peptide Duramycin with Lipid Monolayers**  
Izabela I. Rzeźnicka, Maria Sovago, Mischa Bonn, Toshihide Kobayashi, Taro Yamada, Maki Kawai (RIKEN, AMOLF, Univ. of Tokyo)
- P17 Formation of Ion-Pairs between Positively-Charged SAMs and Counter Anions Observed by Potential-Controlled Atomic Force Microscopy**  
Yasuyuki Yokota, Taro Yamada, and Maki Kawai (Surface Chemistry Laboratory, RIKEN, Univ. of Tokyo)
- P18 Observation on Electrochemical Response of Fluidic Phospholipid Monolayer on Au(111) Modified with 1-Octanethiol**  
Soichiro Matsunaga, Ryo Yokomori, Daisuke Ino, Taro Yamada, and Maki Kawai, Toshihide Kobayashi (Univ. of Tokyo, RIKEN)
- P19 Cholesterol Gradient in Biological Membranes**  
Kotono Murase-Tamada, Motohide Murate, Tomohiro Hayakawa, Kyoko Nakamura, Kazuki Ito, Yukiko Shimada, Yoshiko Ohno-Iwashita, and Toshihide Kobayashi (Lipid Biology Lab., RIKEN, Tokyo Metropolitan Institute of Gerontology, INSERM, France)
- P20 *In Aqua* Miniaturization of a 3-Dimensional Nano-Structure and Semi-conductor Memory Device Using a Peptide Aptamer**  
Ken-Ichi Sano (Molecular and System Life Science Unit, RIKEN)

- P21 Simultaneous Measurement of Optical and Electrical Properties of Ion-Channel Proteins**  
Toru Ide, Minako Hirano, and Yuko Takeuchi (Osaka Univ.)
- P22 Cell-free Synthesis and Reconstitution of Large Conductance, Calcium Sensitive Potassium Channels into Planar Lipid Bilayers**  
Yuko Takeuchi, Takaaki Aoki, Minako Hirano, and Toru Ide (Network Center for Molecular and System Life Sciences, Soft Biosystem Group, Osaka Univ.)
- P23 Lysenin Channel as a Nanopore for Biosensing Applications**  
Takaaki Aoki, Minako Hirano, Yuko Takeuchi, Toshihide Kobayashi, Toshio Yanagida, and Toru Ide (Osaka Univ., CREST, JST, RIKEN)
- P24 High-Resolution Analysis of the Hierarchical Clustering of Epidermal Growth Factor Receptor in the Cell Membrane**  
Michio Hiroshima and Yasushi Sako (Cellular Informatics Lab., RIKEN)
- P25 Polyplex Micells from Triblock Copolymer for Systemic Gene Delivery**  
Kanjiro Miyata, Makoto Oba, Mitsunobu R. Kano, Shigeto Fukushima, Nobuhiro Nishiyama, and Kazunori Kataoka (CNBI Univ. of Tokyo)
- P26 Development of Small Molecular Artificial Chaperone for Protein Refolding and Artificial Chaperone-Assisted Proteomics Technology**  
Satoshi Yamaguchi, Etsushi Yamamoto, and Teruyuki Nagamune (CNBI Univ. of Tokyo)
- P27 Cell Membrane Carbohydrate Detection by Using Field Effect Transistor**  
Akira Matsumoto, Naoko Sano, Toshiya Sakata, and Yuji Miyahara (CNBI Univ. of Tokyo, NIMS)
- P28 Development of FRET based in situ Sensor for Caspase-3 by Using Nanoneedle Technology**  
Takanori Kihara, Chikashi Nakamura, Miho Suzuki, Kyoko Fukazawa, Kazuhiko Ishihara, and Jun Miyake (CNBI Univ. of Tokyo, AIST, Saitama Univ.)