

ISNAC 2018

The 45th International Symposium on Nucleic Acids Chemistry 2018

The 2nd Annual Meeting of Japan Society of Nucleic Acids Chemistry



第45回国際核酸化学シンポジウム 日本核酸化学会第2回年会

Program & Abstracts



Period **November 7^(Wed) - 9^(Fri), 2018**

Venue **Kyoto University
Clock Tower Centennial Hall,
Yoshida Campus**

Organizer **Hiroshi Sugiyama** Kyoto University



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Clock Tower Centennial Hall,
Yoshida Campus**

Yoshida-honmachi, Sakyo-ku, Kyoto 606-8501, JAPAN

Symposium Organizer

Prof. Hiroshi Sugiyama

Graduate School of Science, Kyoto University

Sponsored by

Japan Society of Nucleic Acids Chemistry

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Greeting

Welcome to ISNAC 2018 in Kyoto!

On behalf of the organizing committee and executive committee of the 45th International Symposium on Nucleic Acids Chemistry (ISNAC 2018), I am pleased to pen greetings and invite you all to join ISNAC 2018 to be held from November 7 (Wed) – 9 (Fri), 2018 at Kyoto University Clock Tower Centennial Hall, Kyoto, Japan. We are also delighted to inform that the 2nd annual meeting of the Japan Society of Nucleic Acids Chemistry (JSNAC) established last year would be combined with the ISNAC 2018.

ISNAC inaugurated in 1973 as an annual domestic meeting of nucleic acid chemists in Japan got evolved as an international symposium in 2005 with invited nucleic acid chemists from all over the world. Presently, ISNAC is one of the largest and most active symposiums of bio-related chemistry in the world. With the growing number of scientists focusing on nucleic acid-based research, ISNAC is now extending its scope to encompass diverse aspects of synthetic biology, computational biology, gene regulation, epigenetics, bioengineering, molecular biology, nanobiotechnology, and therapeutic and/or diagnostic applications of these fields as well as nucleic acid chemistry.

It is a great honor for us to host ISNAC 2018 in Kyoto with excellent speakers invited from around the world. We will arrange an exciting scientific program to bring together this scientific community to discover, share and network with the leading experts in nucleic acids research.

Again, we extend a cordial welcome to everyone from students to senior scientists and researchers engaging in the research fields mentioned above in both academia and industry. We are very much looking forward to seeing you all in Kyoto.

Hiroshi Sugiyama



Chairman of ISNAC 2018

Hiroshi Sugiyama
Graduate School of Science,
Kyoto University

Information for Participants, Chairs, and Presenters

General Information for Participants

1. Reception

On-site registration, certificate issuing, cloak and other general inquiries are available during the following hours at the venue.

Date	Open Hours
Nov. 7 (Wed)	9:10 - 18:30
Nov. 8 (Thu)	9:00 - 20:30
Nov. 9 (Fri)	9:00 - 12:30

< On-site Registration fee >

*Regular: 35,000JPY

*Student: 15,000JPY

Only payment in Japanese yen in cash is acceptable.

2. Exchange Meeting

Nov. 8 (Thu) 18:30 - 20:30 at International Conference Hall (2F)

* Application on-site is available for 5,000JPY (Student) as long as there is vacancy, please ask the receptionists.

3. Internet

Wireless Internet service is available at the venue.

4. Exhibition

Nov. 7 (Wed) 9:55 - 18:30

Nov. 8 (Thu) 9:20 - 18:25

Nov. 9 (Fri) 9:20 - 12:30

5. Awards of Young Scientist

ISNAC2018 offers "ISNAC Outstanding Oral Presentation Award for Young Scientist in 2018" and "ISNAC Outstanding Poster Award in 2018".

Awardees' names and affiliations will be announced and commended at the Exchange Meeting (Nov. 8).

Instruction for Chairs

1. Arrival

Chairpersons are requested to be seated at the "next chairs' sheet" located in the right front of the hall later than 10 minutes before the start of the presentations.

2. Session Progress

Chairpersons are asked to ensure that all presentations start and finish punctually as scheduled. Staffs will assist with timing. Remaining time will be notified with bell signal as follows;

- 1 ring: Warning - at 3 minutes left to the end of talk
- 2 rings: End of talk - time for discussion
- 3 rings: End of presentation - time for the next speaker

Instruction for Oral Presenters

1. Time Allocation

Invited Lectures: Presentation 35 min. + Discussion 5 min. (Total: 40min.)

Oral Presentations: Presentation 12 min. + Discussion 3 min. (Total: 15min.)

2. Presentation Materials

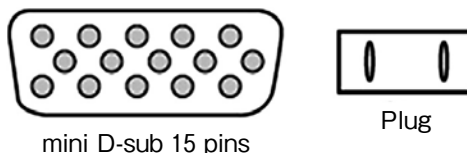
Only computer-based Powerpoint presentations will be accepted, and no sound output equipment will be available.

3. Laptop Computer

Please be sure to bring your own laptop computer. We ask you to bring your presentation file in USB or CD-ROM for back up as well.

< Technical Requirements for Your Laptop Computer >

- Ensure that your computer is equipped with the proper monitor connector (mini D-sub 15 pin) as shown below. If your computer does not have this connection, please bring an appropriate converter with you.
- Be sure to bring an AC adaptor. Please note that voltage in Japan is 100 V and the frequency ranges 50 - 60 Hz depending on the area (60 Hz in Kyoto).
The socket is type A, which has two flat plug holes. If your laptop is not convertible, transformers and/or plug adaptors are necessary.
- Adjust the settings to prevent activation of the screen saver or power-saving mode.



4. Preparation

Please bring your computer to the Oral Presentation Hall stage during coffee or lunch break before your presentation.

5. Timing

In order to maintain the schedule, you are requested to keep time allocation strictly.

Remaining time will be notified with bell signal as follows;

- 1 ring: Warning - at 3 minutes left to the end of talk
- 2 rings: End of talk - time for discussion
- 3 rings: End of presentation - time for the next speaker

Instruction for Poster Presenters

1. Set-up and Removal

Set-up and removal time will be as following.

Set-up: Nov. 7 (Wed) 9:00 - 13:00

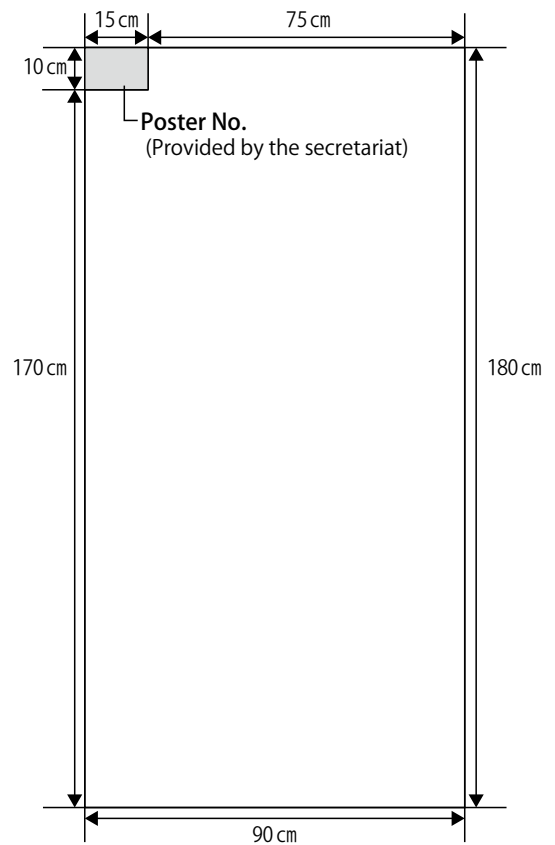
Removal: Nov.8 (Thu) 16:05 - 16:25

* Any posters remaining on panels after the removal time will be discarded by the secretariat.

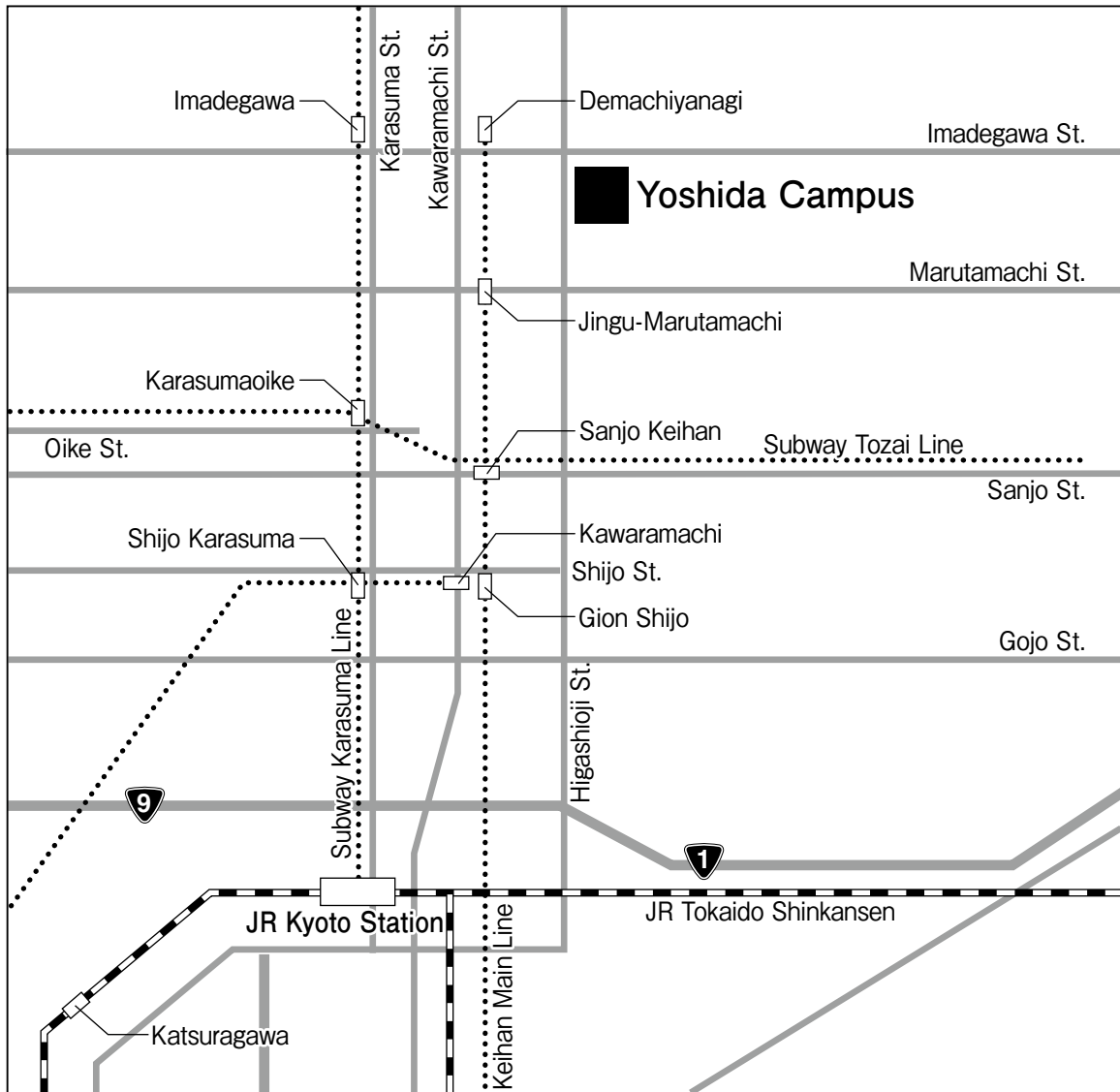
2. Poster Presentations

Odd numbers: Nov. 7 (Wed) 13:15 - 14:45

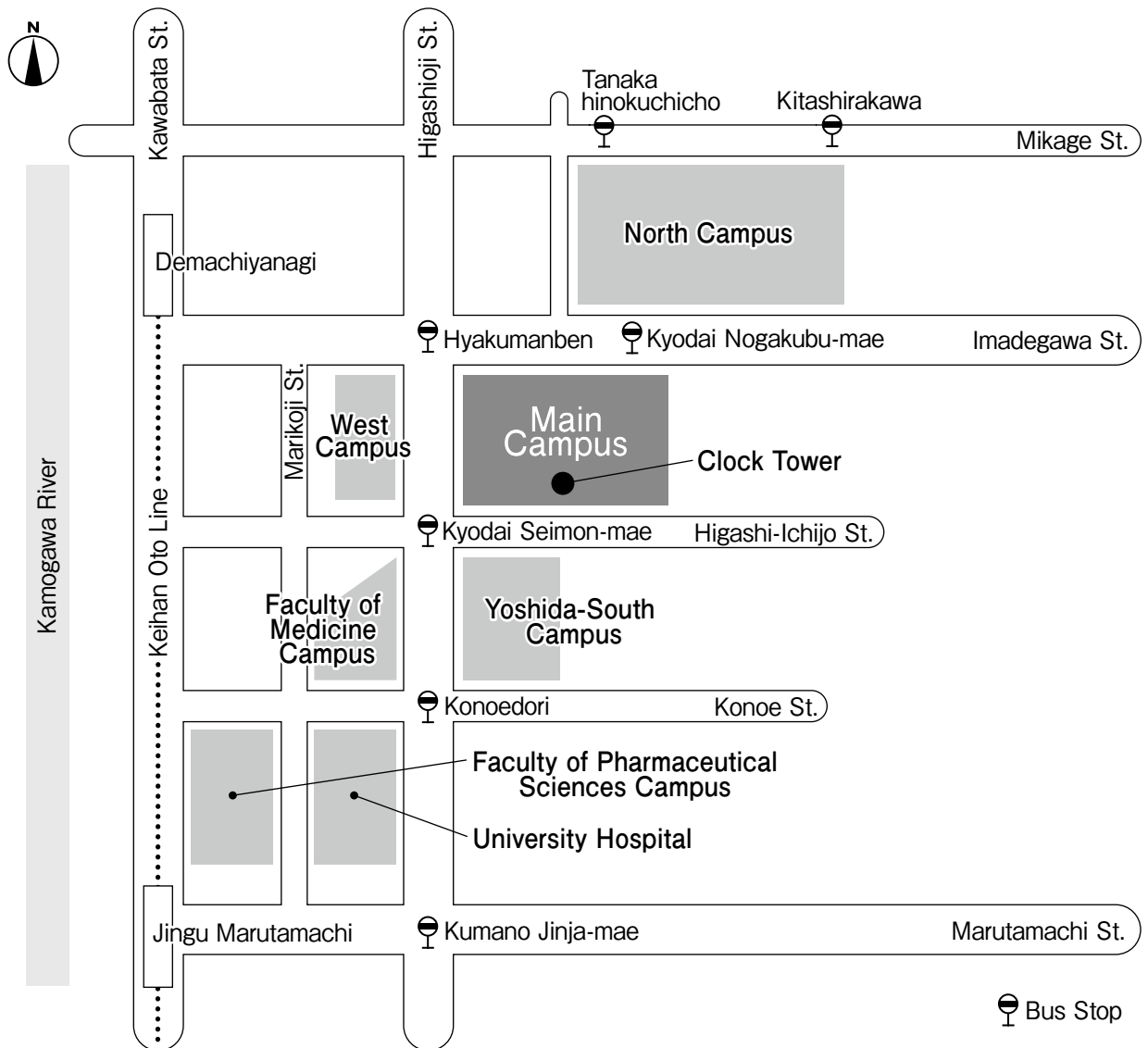
Even numbers: Nov. 8 (Thu) 13:05 - 14:35



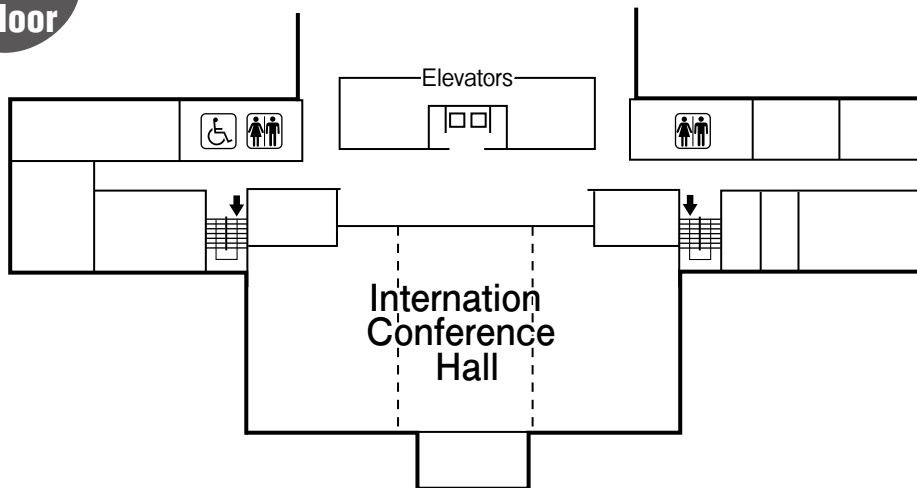
Around the Venue



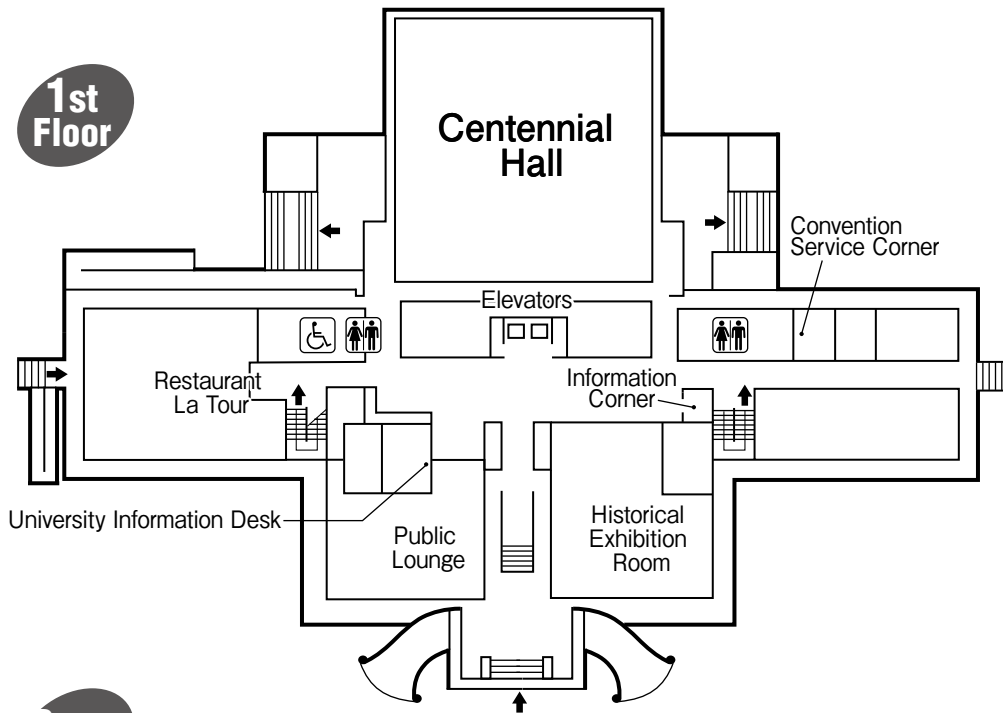
Map of the Venue



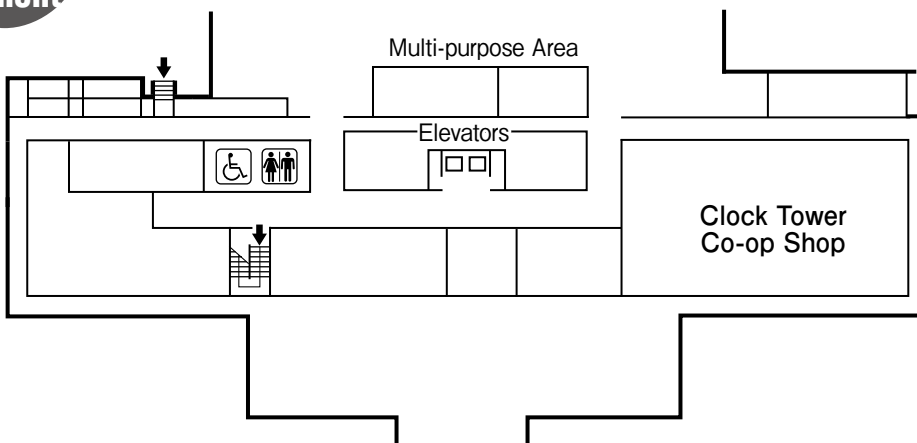
2nd Floor



1st Floor



Base ment



Program

Day 1: November 7 (Wed)

9:55-10:00	Opening Remarks	
10:00-10:15	Oral Presentations Chair: Noriaki Minakawa Tokushima Univ.	10-01 Development of 2'-β Seleno Nucleoside Analogs as Irreversible Inhibitors for Viral Polymerases <u>Yasuaki Kimura</u> ¹⁾ , Yushi Niimi ¹⁾ , Hideo Katakura ¹⁾ , Fumiaki Tomoike ²⁾ , Tetsuro Suzuki ³⁾ , Tsutomu Murakami ⁴⁾ , Eiichi Kodama ⁵⁾ , Hiroshi Abe ¹⁾⁶⁾ 1) Department of Chemistry, Graduate School of Science, Nagoya University, 2) Research Center for Materials Science, Nagoya University, 3) Department of Virology and Parasitology, Hamamatsu University School of Medicine, 4) AIDS Research Center Laboratory III, National Infectious Diseases, 5) Division of Infectious Diseases, International Research Institute of Disaster Science, Tohoku University, 6) JST CREST "Large-Scale Genome Synthesis and Cell Programming"
10:15-10:30		10-02 Synthesis of cell-membrane permeable oligonucleotides bearing GSH-activated protecting groups on the inter-nucleotide linkages <u>Hisao Saneyoshi</u> , Takayuki Ohta, Yuki Hiyoshi, Akira Ono Department of Material and Life Chemistry, Faculty of Engineering, Kanagawa University
10:30-10:45		10-03 Remarkable Enhancement of RNaseH Cleavage Activities of RNA Complexed with Peptide Ribonucleic Acid (PRNA) - Novel Backbone Modification Strategy for Nuclease Cleavage Activity Improvements - Masahito Inagaki ¹⁾ , Daisuke Unabara ¹⁾ , Hiroka Sugai ¹⁾ , Yasuyuki Araki ¹⁾ , Masaki Nishijima ¹⁾ , Satoru Ishibashi ²⁾ , Takanori Yokota ²⁾ , Asako Yamayoshi ³⁾ , Kazuhiko Nakatani ⁴⁾ , <u>Takehiko Wada</u> ¹⁾ 1) IMRAM, Tohoku University, 2) Department of Neurology and Neurological Science, Tokyo Medical and Dental University, 3) Graduate School of Biomedical Sciences, Nagasaki University, 4) The Institute of Scientific and Industrial Research, Osaka University
10:45-11:00	Oral Presentations Chair: Akira Ono Kanagawa Univ.	10-04 N-(Alkanesulfonyl) -Phosphoramidate Oligonucleotides as Potential Antisense Agents <u>Dmitry Stetsenko</u> ¹⁾²⁾ , Ekaterina Burakova ¹⁾ , Boris Chelobanov ¹⁾²⁾ , Alesya Fokina ¹⁾ , Olga Patutina ¹⁾ , Svetlana Miroshnichenko ¹⁾ , Masayuki Fujii ³⁾ , Marina Zenkova ¹⁾ 1) Institute of Chemical Biology and Fundamental Medicine, Siberian Branch of the Russian Academy of Sciences, 2) Novosibirsk State University, Novosibirsk, Russia, 3) Kindai University, Fukuoka, Japan
11:00-11:15		10-05 From Stereopurity to Precision Medicine: Optimizing the Properties of Antisense Nucleic Acid Therapeutics <u>Pachamuthu Kandasamy</u> , Gopal Bommineni, Michael Byrne, Ann Durbin, Naoki Iwamoto, Jayakanthan Kumarasamy, Fangjun Liu, Yuanjing Liu, Juili Shelke, Mamoru Shimizu, Chikdu Shivalila, Stephany Standley, Snehlata Tripathi, Hailin Yang, Yuan Yin, Jason Zhang, Zhong Zhong, Chandra Vargeese Wave Life Sciences
11:15-11:35	Break	
11:35-12:15	Invited Lecture Chair: Hiroshi Sugiyama Kyoto Univ.	IL-01 Visualization of DNA Sequences with TAMRA-polypyrrole Seonghyun Lee ¹⁾ , Yusuke Kawamoto ²⁾ , Hiroshi Sugiyama ²⁾ , <u>Kyubong Jo</u> ¹⁾ 1) Department of Chemistry, Sogang University, 2) Department of Chemistry, Graduate School of Science, Kyoto University

12:15-13:15	Lunch Break	
13:15-14:45	Poster Presentations (Odd Numbers)	
14:45-15:00	Oral Presentations Chair: Takeshi Wada Tokyo Univ. of Science	10-06 8-position modified 2'-deoxyguanosine derivatives for studying non-B DNA structures <u>Hongliang Bao</u> , Takumi Ishizuka, Yan Xu Division of Chemistry, Department of Medical Sciences, Faculty of Medicine, University of Miyazaki
15:00-15:15		10-07 Hexaplex formation by artificial nucleic acid tethering bifacial nucleobases <u>Hiromu Kashida</u> ¹⁾ , Yuhei Hattori ¹⁾ , Kentaro Ishii ²⁾ , Susumu Uchiyama ²⁾ , Hiroyuki Asanuma ¹⁾ 1) Department of Biomolecular Engineering, Graduate School of Engineering, Nagoya University, 2) ExCELLS, National Institutes of Natural Sciences
15:15-15:30		10-08 RNA aptamers targeting the toxic oligomer of A β 42 and their application to histochemistry <u>Kazuma Murakami</u> ¹⁾ , Yayoi Obata ¹⁾ , Asa Sekikawa ¹⁾ , Haruka Ueda ¹⁾ , Naotaka Izuo ²⁾ , Tatsuya Awano ³⁾ , Keiji Takabe ³⁾ , Takahiko Shimizu ²⁾ , Kazuhiro Irie ¹⁾ 1) Division of Food Science and Biotechnology, Graduate School of Agriculture, Kyoto University, 2) Department of Advanced Aging Medicine, Graduate School of Medicine, Chiba University, 3) Division of Forest and Biomaterials Science, Graduate School of Agriculture, Kyoto University
15:30-15:45	Oral Presentations Chair: Hiroyuki Asanuma Nagoya Univ.	10-09 Cyclic naphthalene diimide for tetraplex DNA recognition and its application of cancer therapy <u>Tingting Zou</u> ¹⁾²⁾ , Ryusuke Takeuchi ¹⁾ , Daiki Wakahara ¹⁾ , Shinobu Sato ¹⁾²⁾ , Shigeori Takenaka ¹⁾²⁾ 1) Department of Applied Chemistry, Kyushu Institute of Technology, 2) Research Center for Bio-microsensing Technology, Kyushu Institute of Technology
15:45-16:00		10-10 Recognition of DNA GGGGCC repeats by novel naphthyridine tetramer <u>Yihuan Lu</u> , Chikara Dohno, Kazuhiko Nakatani The Institute of Scientific and Industrial Research, Osaka University
16:00-16:15		10-11 Structure-based design of a eukaryote-selective aminoglycoside <u>Hiroki Kanazawa</u> ¹⁾ , Oscar M. Saavedra ²⁾ , Juan Pablo Mianti ²⁾ , Simon A. Young ³⁾ , Luis Izquierdo ⁴⁾ , Terry K. Smith ³⁾ , Stephen Hanessian ²⁾ , Jiro Kondo ¹⁾ 1) Faculty of Science and Technology, Sophia University, 2) Department of Chemistry, Université de Montréal, 3) Biomedical Sciences Research Complex, University of St. Andrews, 4) ISGlobal, Hospital-Clinic-Universitat de Barcelona
16:15-16:35	Break	
16:35-17:15	Invited Lecture Chair: Akimitsu Okamoto Univ. of Tokyo	IL-02 DNA structures in nanoconfinement <u>Hanbin Mao</u> Professor, Department of Chemistry & Biochemistry and School of Biomedical Sciences, Kent State University

17:15-17:30	Oral Presentations Chair: Fumi Nagatsugi Tohoku Univ.	10-12 1D-Oligomerization of a biparticle ribozyme rescues its mutations that disturb the assembly of the catalytic core <u>Yoshiya Ikawa</u> ¹⁾²⁾ , Md. Motiar Rahman ²⁾ , Shigeyoshi Matsumura ¹⁾ 1) Graduate School of Science & Engineering, University of Toyama, 2) Graduate School of Innovative Life Science, University of Toyama
17:30-17:45		10-13 Functional and Structural Insights into the Translesion Synthesis across <i>N</i> ² -dG Damaged DNAs <u>P.I. Pradeepkumar</u> ¹⁾ , Pratibha P Ghodke ¹⁾ , Praneeth Bhommisetti ¹⁾ , Deepak T Nair ²⁾ 1) Department of Chemistry, 2) UNESCO-Regional Center for Biotechnology, New Delhi-121001
17:45-18:00		10-14 Phase separation of repeated RNA with amyloid-like protein in neurodegenerative diseases is promoted by RNA G-quadruplexes <u>Ye Teng</u> ¹⁾ , Hisae Tateishi-Karimata ¹⁾ , Naoki Sugimoto ¹⁾²⁾ 1) Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University, 2) Graduate School of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University
18:00-18:15	Oral Presentations Chair: Asako Yamayoshi Nagasaki Univ.	10-15 Development of small molecular G-clamp derivatives binding to RNA higher-order structure <u>Hiroataka Murase</u> , Fumi Nagatsugi Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
18:15-18:30		10-16 Preparation of acetylene-tagged oligonucleotides and their structural analysis by Raman spectra <u>Kazuhito Tanabe</u> , Ryota Itaya, Wakana Idei, Ryohsuke Kurihara Department of Chemistry and Biological Science, College of Science and Engineering, Aoyama Gakuin University

Day 2: November 8 (Thu)

9:20-9:35	Oral Presentations Chair: Atsushi Maruyama Tokyo Inst. of Tech.	20-01 Mutational analysis and improvement of Baby Spinach focusing on its G-quadruplex structure <u>Kinuko Ueno</u> ¹⁾ , Kaori Tsukakoshi ¹⁾ , Alessandro Porchetta ²⁾ , Francesco Ricci ²⁾ , Kazunori Ikebukuro ¹⁾ 1) Department of Biotechnology and Life Science, Graduate School of Engineering, Tokyo University of Agriculture and Technology, 2) Department of Chemical Sciences and Technologies, University of Rome Tor Vergata
9:35-9:50		20-02 Structural Perspectives of the DNA binding properties of Ruthenium Polypyridyl Complexes <u>Kane McQuaid</u> ¹⁾³⁾ , James Hall ²⁾³⁾ , Holly Abell ¹⁾ , Shuntaro Takahashi ⁴⁾ , Naoki Sugimoto ⁴⁾ , David Allan ³⁾ , David Cardin ¹⁾ , John Brazier ³⁾ , Christine Cardin ¹⁾ 1) Department of Chemistry, University of Reading, UK, 2) Diamond Light Source Ltd., Harwell, Berkshire, UK, 3) Department of Pharmacy, University of Reading, Berkshire, UK, 4) Frontier Institute for Biomolecular Engineering Research (FIBER), Kobe, Japan.
9:50-10:05	Oral Presentations Chair: Hidetaka Torigoe Tokyo Univ. of Science	20-03 Antiparallel G-quadruplex formed by human telomere RNA <u>Chao-Da Xiao</u> ¹⁾ , Xiangchun Shen ²⁾ , Yan Xu ³⁾ 1) State Key Laboratory of Functions and Applications of Medicinal Plants, School of Pharmaceutical Sciences, Guizhou Medical University, 2) The Key Lab of Optimal Utilization of Natural Medicine Resources, School of Pharmaceutical Sciences, Guizhou Medical University, 3) Division of Chemistry, Department of Medical Sciences, Faculty of Medicine, University of Miyazaki
10:05-10:20		20-04 Modulating diffusion speed of DNA by toehold exchange <u>Ibuki Kawamata</u> ¹⁾ , Thanapop Rodjanapanyakul ¹⁾ , Fumi Takabatake ²⁾ , Keita Abe ¹⁾ , Shinichiro M. Nomura ¹⁾ , Satoshi Murata ¹⁾ 1) Department of Robotics, School of Engineering, Tohoku University, 2) High Energy Accelerator Research Organization
10:20-10:40	Break	
10:40-11:20	Invited Lecture Chair: Naoki Sugimoto Konan Univ.	IL-03 The RNA nanomachines of gene expression dissected at the single molecule level <u>Nils G. Walter</u> Professor, Single Molecule Analysis Group, Department of Chemistry, University of Michigan
11:20-11:35	Oral Presentations Chair: Kohji Seio Tokyo Inst. of Tech.	20-05 In-cell NMR studies on structure and dynamics of DNA and RNA introduced inside the living human cells <u>Yudai Yamaoki</u> ¹⁾ , Takashi Nagata ¹⁾²⁾ , Ayaka Kiyoshi ²⁾ , Masayuki Miyake ²⁾ , Kuan-Heng Lin ²⁾ , Shohei Takami ²⁾ , Fumi Kano ³⁾ , Masayuki Murata ³⁾⁴⁾ , Masato Katahira ¹⁾²⁾ 1) Institute of Advanced Energy, Kyoto University, 2) Graduate School of Energy Science, Kyoto University, 3) Institute of Innovative Research, Tokyo Institute of Technology, 4) Graduate School of Arts and Sciences, The University of Tokyo
11:35-11:50		20-06 Chemical modifications of aminopyridine unit of 2'-deoxy aminopyridinyl-pseudocytidine to tune the recognition ability for the formation of the triplex DNA with CG inversion sites <u>Lei Wang</u> , Yosuke Taniguchi, Hidenori Okamura, Shigeki Sasaki Graduate School of Pharmaceutical Sciences, Kyushu University
11:50-12:05		20-07 Development of an Immune Cell-Targeted Nanostructured DNA for CpG ODN Delivery by Mannose Modification <u>Wenqing Liao</u> ¹⁾²⁾ , Sakiko Akahira ²⁾ , Kosuke Kusamori ²⁾ , Rintaro Hara ²⁾³⁾ , Takeshi Wada ²⁾ , Yuki Takahashi ¹⁾ , Yoshinobu Takakura ¹⁾ , Makiya Nishikawa ²⁾ 1) Graduate School of Pharmaceutical Sciences, Kyoto University, 2) Graduate School of Pharmaceutical Sciences, Tokyo University of Science, 3) Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University

12:05-13:05	Lunch Break	
13:05-14:35	Poster Presentations (Even Numbers)	
14:35-14:50	Oral Presentations Chair: Takehiko Wada Tohoku Univ.	20-08 Coulomb and CH- π interaction in (6-4) photolyase-DNA complex dominate DNA binding and repair abilities <u>Yuma Terai</u> ¹⁾ , Ryuma Sato ²⁾ , Takahiro Yumiba ¹⁾ , Ryuhei Harada ²⁾ , Kohei Shimizu ¹⁾ , Shigenori Iwai ¹⁾ , Yasuteru Shigeta ²⁾ , Junpei Yamamoto ¹⁾ 1) Division of Chemistry, Graduate School of Engineering Science, Osaka University, 2) Center for Computational Sciences, University of Tsukuba
14:50-15:05		20-09 Development of a novel gene expression control strategy which is able to eliminate off-target effect <u>Yusuke Katsuda</u> ¹⁾ , Shin-ichi Sato ²⁾ , Takuto Kamura ¹⁾ , Yusuke Kitamura ¹⁾ , Masaki Hagihara ³⁾ , Toshihiro Ihara ¹⁾ 1) Faculty of Advanced Science and Technology Kumamoto University, 2) Institute for Chemical Research, Kyoto University, 3) Graduate School of Science and Technology, Hirosaki University
15:05-15:20		20-10 Photo-triggered double duplex invasion DNA using ultrafast photo-cross-linker <u>Shigetaka Nakamura</u> , Hayato Kawabata, Daisuke Maeda, Kenzo Fujimoto Department of Advanced Science and Technology, JAIST
15:20-15:35	Oral Presentations Chair: Toshihiro Ihara Kumamoto Univ.	20-11 Synthesis and properties of triplex-forming oligonucleotides containing modified sugar moieties and nucleobases <u>Shuhei Nishizawa</u> ¹⁾ , Tatsuya Ohnishi ¹⁾ , Lintaro Watanabe ¹⁾ , Takashi Kanamori ¹⁾ , Hideya Yuasa ¹⁾ , Akihiro Ohkubo ¹⁾²⁾ 1) Department of Life Science and Technology, School of Life Science and Technology, Tokyo Institute of Technology, 2) CREST, Japan Science and Technology Agency (JST)
15:35-15:50		20-12 Encapsulation of Long DNA into Polyelectrolyte Capsules <u>Anatoly Zinchenko</u> , Eisuke Inagaki, Shizuaki Murata Graduate School of Environmental Studies, Nagoya University
15:50-16:05		20-13 Metabolic labeling and intercalation-directed “click” crosslinking of DNA <u>Masayuki Tera</u> ¹⁾²⁾ , Nathan W. Luedtke ¹⁾ 1) Department of Chemistry, University of Zurich, 2) Suntory Foundation for Life Sciences
16:05-16:25	Break	
16:25-17:25	JSNAC General Meeting	
17:25-17:55	Special Lecture Chair: Shigeki Sasaki Kyushu Univ.	SL-01 Development of oligonucleotides having nuclease resistance properties <u>Akira Matsuda</u> Faculty of Pharmaceutical Sciences, Center for Research & Education on Drug Discovery, Hokkaido University, Sapporo, Japan
17:55-18:25		SL-02 My Study Life in Oligonucleotide Synthesis <u>Mitsuo Sekine</u> Kankyo Resilience Co., Ltd
18:30-20:30	Exchange Meeting International Conference Hall	

Day 3: November 9 (Fri)

9:20-9:35	Oral Presentations Chair: Shigeori Takenaka Kyushu Inst. of Tech.	30-01 Chemo-enzymatic click labeling and direct sequencing of epigenetic DNA marks using TOP-seq <u>Saulius Klimašauskas</u> , Zdislav Staševskij, Povilas Gibas, Juozas Gordevičius, Edita Kriukienė Institute of Biotechnology, Life Sciences Center, Vilnius University
9:35-9:50		30-02 Single-molecule monitoring of structural switching dynamics of preQ1 riboswitch <u>Kiyohiko Kawai</u> ¹⁾ , Takafumi Miyata ²⁾ , Naohiko Shimada ²⁾ , Syoji Ito ³⁾ , Hiroshi Miyasaka ³⁾ , Atsushi Maruyama ²⁾ 1) The Institute of Scientific and Industrial Research (SANKEN), Osaka University, 2) Department of Life Science and Technology, Tokyo Institute of Technology, 3) Graduate School of Engineering Science, Osaka University
9:50-10:05	Oral Presentations Chair: Ryosuke Ueki Univ. of Tokyo	30-03 Chaperoning of the allosteric nucleic acid enzymes with cationic copolymers Orakan Hanpanich, Naohiko Shimada, <u>Atsushi Maruyama</u> Department of Life Science and Technology, Tokyo Institute of Technology
10:05-10:20		30-04 Metal-mediated base pairs; the modification of DNA for future nano-electronics <u>Vladimír Sychrovský</u> ¹⁾ , Jakub Šebera ¹⁾ , Yoshiyuki Tanaka ²⁾³⁾ , Akira Ono ⁴⁾ , Jiří Fukal ¹⁾ , Magdalena Hromadová ⁵⁾ , Viliam Kolivoška ⁵⁾ 1) Institute of Organic Chemistry and Biochemistry of the CAS, Czech Republic, 2) Faculty of Pharmaceutical Sciences, Tokushima Bunri University, Japan, 3) Graduate School of Pharmaceutical Sciences, Tohoku University, Japan, 4) Department of Material & Life Chemistry, Kanagawa University, Japan, 5) J. Heyrovský Institute of Physical Chemistry of the CAS, Czech Republic
10:20-10:40	Break	
10:40-11:20	Invited Lecture Chair: Takashi Morii Kyoto Univ.	IL-04 Lipid-oligonucleotide conjugates forming G-Quadruplex as broad inhibitors of enveloped Viruses <u>Sébastien Lyonnais</u> ¹⁾ , Santiago Grijalvo ²⁾ , George Koutsoudakis ³⁾ , Andreas Meyherhans ⁴⁾ , Juana Díez ³⁾ , Gilles Mirambeau ⁶⁾ , Ramon Eritja ²⁾ 1) CEMIPAI, Université de Montpellier-CNRS UMS3725, 34293 Montpellier, France, 2) IQAC-CSIC, CIBER-BBN, 08034 Barcelona, Spain, 3) IDIBAPS · Division of Liver, Digestive System and Metabolism, Viral Hepatitis, Barcelona, Spain, 4) Molecular Virology Group and 5) Infection Biology Group, Universitat Pompeu Fabra, Barcelona, Spain, 6) Sorbonne Université, Faculté des Sciences et Ingénierie, UFR 927 des Sciences de la Vie, Paris, France
11:20-11:35	Oral Presentations Chair: Masayuki Endo Kyoto Univ.	30-05 Single-Molecule and Real-Time Observation of Cyclodextrin-Rotaxane Incorporated into DNA Origami with Nanocavities <u>Akinori Kuzuya</u> ¹⁾²⁾ , Naohide Akamatsu ¹⁾ , Mana Ishino ¹⁾ , Hitomi Okuyama ¹⁾ , Fumito Baba ¹⁾ , Yuichi Ohya ¹⁾²⁾ 1) Department of Chemistry and Materials Engineering, Kansai University, 2) Collaborative Research Center of Engineering, Medicine, and Pharmacology, ORDIST, Kansai University
11:35-11:50		30-06 Self-assembly of Dendritic DNA into Nanohydrogel for delivery of multimoduls therapeutics Bella Rosa Liyarita, <u>Fangwei Shao</u> Division of Chemistry and Biological Chemistry, Nanyang Technological University

11:50-12:05	Oral Presentations Chair: Hirohide Saito Kyoto Univ.	30-07 Thermodynamic Properties of the Specific Binding of 4-Thiothymine to Each of Thymine and Cytosine in Mismatched Duplex DNA by Different Metal Ions Ayami Yaguchi ¹⁾ , Akira Ono ²⁾ , Jiro Kondo ³⁾ , <u>Hidetaka Torigoe</u> ¹⁾ 1) Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, 2) Department of Material & Life Chemistry, Faculty of Engineering, Kanagawa University, 3) Department of Materials and Life Sciences, Faculty of Science and Technology, Sophia University
12:05-12:20		30-08 DNA Binding Adaptors for Locating Multiple Enzymes on DNA scaffold <u>Eiji Nakata</u> , Thang Minh Nguyen, Zhengxiao Zhang, Huyen Dinh, Peng Lin, Masayuki Saimura, Takashi Morii Institute of Advanced Energy, Kyoto University
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P001 Efficient preparation of small single-stranded DNA rings with stable secondary structures

Yixiao Cui, Xutiange Han, Ran An, Yaping Zhang, Xingguo Liang, Makoto Komiyama
College of Food Science and Engineering, Ocean University of China

P002 Topologically constrained formation of stable left-handed DNA structure under physiological conditions

Zhang Yaping, Ran An, Yixiao Cui, Makoto Komiyama, Xingguo Liang
College of Food Science and Engineering

P003 Synthesis of various furanoid glycal derivatives and their use as stimuli-responsive tools by precise control of their decomposition to furan derivatives

Yoshiaki Kitamura¹⁾²⁾, Koki Terazawa²⁾, Yuki Nagaya³⁾, Ryo Asakura²⁾, Katsuki Tanaka²⁾, Masato Ikeda¹⁾²⁾³⁾, Yukio Kitade¹⁾⁴⁾

1) Faculty of Engineering, Gifu University, 2) Graduate School of Engineering, Gifu University, 3) United Graduate School of Drug Discovery and Medical Information Sciences, Gifu University, 4) Faculty of Engineering, Aichi Institute of Technology

P004 Development of an unnatural nucleic acid base pair with “*anti-syn*” like glycosidic conformation

Yuya Moriyama¹⁾²⁾, Kunihiko Morihiko¹⁾, Akimitsu Okamoto¹⁾²⁾

1) Department of Chemistry and Biotechnology, School of Engineering, The University of Tokyo, 2) Research Center for Advanced Science and Technology, The University of Tokyo

P005 Formation of a stable 1,3,9-triaza-2-oxophenoxazine self-base pair mediated by silver(I) ions

Akane Fujii, Yuki Kishimoto, Yusuke Nakatsuji, Natsumi Nozaki, Osamu Nakagawa, Satoshi Obika
Graduate School of Pharmaceutical Sciences, Osaka University

P006 Solid-phase synthesis of phosphate/boranophosphate (PO/PB) chimeric oligodeoxyribonucleotides by the *H*-boranophosphonate-*H*-phosphonate method

Hiroki Imai¹⁾, Tomohito Shuto²⁾, Rintaro Hara¹⁾³⁾, Kazuki Sato¹⁾, Takeshi Wada¹⁾

1) Graduate School of Pharmaceutical Sciences, Tokyo University of Science, 2) Graduate School of Frontier Sciences, The University of Tokyo, 3) Graduate School of Medical and Dental Sciences

P007 Post-synthetic conversion of 5-trifluoromethylpyrimidine bases within oligonucleotides

Yuta Ito, Misaki Matsuo, Kazuki Yamamoto, Wakana Yamashita, Takashi Osawa, Yoshiyuki Hari
Faculty of Pharmaceutical Sciences, Tokushima Bunri University

P008 Synthesis of 7-deazaguanosine Derivatives

Natsuhisa Oka¹⁾²⁾, Kouki Nakano¹⁾, Akane Fukuta¹⁾, Ayumi Mori¹⁾, Kaori Ando¹⁾

1) Department of Chemistry and Biomolecular Science, Faculty of Engineering, Gifu University, 2) Center for Highly Advanced Integration of Nano and Life Sciences, Gifu University (G-CHAIN)

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Yuki Nakamura¹⁾, Nazuki Niwa²⁾, Yusuke Maeda³⁾, Taiichi Sakamoto⁵⁾, Yoshihito Ueno¹⁾²⁾³⁾⁴⁾
 1) Department of Life science and Chemistry, the Graduate School of Natural Science and Technology, Gifu University, 2) Graduate School of Applied Biological Science, Gifu University, 3) Faculty of Applied Biological Science, Gifu University, 4) Center of Highly Advanced Integration of Nano and Life Science, Gifu University (G-CHAIN), 5) Faculty of Advanced Engineering, Chiba Institute of Technology
- P010** Synthesis and Properties of Oligonucleotides Including 4'-C-aminomethyl-2'-deoxy-2'-F-arabinonucleoside
Tatsuya Tsuchihira¹⁾, Yusuke Maeda²⁾, Yoshihito Ueno¹⁾²⁾³⁾⁴⁾
 1) Department of Life Science and Chemistry, Graduate School of Natural Science and Technology, Gifu University, 2) Faculty of Applied Life Sciences, Gifu University, 3) The United Graduate School of Agricultural Science, Gifu University, 4) Center for Highly Advanced Integration of Nano and Life Sciences (G-CHAIN), Gifu university
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 Graduate School of Pharmaceutical Sciences, Kyushu University
- P012** Hypoxia-Triggered Activation of Anticancer Drug via Selective Azo Reduction
Takuro Ishinabe¹⁾, Kunihiko Morihiko¹⁾, Akimitsu Okamoto¹⁾²⁾
 1) Department of Chemistry and Biotechnology, Graduate School of Engineering, the University of Tokyo, 2) RCAST, the University of Tokyo
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 Graduate School of Pharmaceutical Sciences, Kyushu University
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Takashi Osawa¹⁾, Han Kim¹⁾, Misa Shoji¹⁾, Masakazu Dohi²⁾, Yuta Ito¹⁾, Satoshi Obika²⁾, Yoshiyuki Hari¹⁾
 1) Faculty of Pharmaceutical Sciences, Tokushima Bunri University, 2) Graduate School of Pharmaceutical Sciences, Osaka University
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Ritsu Hashimoto¹⁾, Shuhei Nishizawa¹⁾, Yu Miyake¹⁾, Takashi Kanamori¹⁾, Hideya Yuasa¹⁾, Akihiro Ohkubo¹⁾²⁾
 1) Department of Life Science and Technology, School of Life Science and Technology, Tokyo institute of technology, 2) CREST, Japan Science and Technology Agency (JST)
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 Graduate School of Pharmaceutical Science, Tokushima University
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Shingo Hirashima¹⁾, Ji Hoon Han¹⁾, Soyoung Park¹⁾, Hiroshi Sugiyama¹⁾²⁾
 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
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 1) Department of Chemistry, Graduate School of Science, Nagoya University, 2) Research Center for Materials Science, Nagoya University, Japan
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 1) Faculty of Medicine, University of Miyazaki, 2) Department of Molecular Imaging and Theranostics, National Institute of Radiological Sciences
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 1) Institute of multidisciplinary research for advanced material (IMRAM), Tohoku university, 2) Department of neurology and neurological science, Tokyo medical and dental university
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 1) Department of Environmental & Biological Chemistry, Kindai University, 2) Division of Pharmacy and Optometry, School of Health Sciences, Faculty of Biology, Medicine and Health Sciences, University of Manchester, 3) College of Science & Technology, School of Environment & Life Sciences, University of Salford
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 1) Graduate school of Science and Technology, Kyoto Institute of Technology, 2) Faculty of Molecular Chemistry and Engineering, Kyoto Institute of Technology
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 1) Division of Biosciences, Graduate School of Science & Engineering, Teikyo University of Science, Graduate School, 2) Department of Life & Health Sciences, Faculty of Life & Environmental Sciences, Teikyo University of Science

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 1) Institute of Chemical Biology and Fundamental Medicine, Siberian Branch of the Russian Academy of Sciences, 2) Novosibirsk State University, Novosibirsk, Russia, 3) Kindai University, Fukuoka, Japan
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 1) Faculty of Pharmaceutical Sciences, Hokkaido University, 2) Faculty of Pharmaceutical Sciences, Health Sciences University of Hokkaido
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 1) Department of Pharmaceutical Sciences, Graduate School of Pharmaceutical Sciences, Tokyo University of Science, 2) Graduate School of Medical and Dental Sciences
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 1) The Institute of Scientific and Industrial Research (ISIR), Osaka University, 2) Helmholtz Institute for RNA-based Infection Research (HIRI), Helmholtz Centre for Infection Research, 3) Department of Physical Biochemistry, Max Planck Institute for Biophysical Chemistry
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 1) Frontier Institute for Biomolecular Engineering Research (FIBER), 2) Graduate School of System Informatics, Kobe University, Kobe, Japan, 3) Graduate School of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University
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 1) Frontier Institute for Biomolecular Engineering Research, Konan University, 2) Graduate School of Frontiers of Innovative Research in Science and Technology, Konan University
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 1) Department of Biomolecular Engineering, Graduate School of Engineering, Nagoya University, 2) Department of Life Science and Technology, Tokyo Institute of Technology

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 College of Engineering Nihon University
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 1) Graduate School of Biomedical and Health Sciences, Hiroshima University, 2) School of Pharmaceutical Sciences, Hiroshima University, 3) Bioproduction Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)
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 1) Faculty of Pharmaceutical Sciences Suzuka University of Medical Sciences, 2) Department of Chemistry, Graduate School of Science, Kyoto University, 3) Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
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 ISIR, Osaka University
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 1) Department of Chemistry and Biotechnology, School of Engineering, The University of Tokyo, 2) The Research Center for Advanced Science and Technology (RCAST), The University of Tokyo.
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 1) Department of Nanobiochemistry, Faculty of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University, 2) Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University
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 1) Department of Chemistry and Biotechnology, Graduate School of Engineering, The University of Tokyo, 2) The Research Center for Advanced Science and Technology, The University of Tokyo
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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Department of Advanced Bioscience, Faculty of Agriculture, Kindai University, 3) Institute for Integrated Cell-Material Science (iCeMS), Kyoto University

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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
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 1) Graduate School of Pharmaceutical Sciences, Kyushu University, 2) Faculty of Pharmaceutical Sciences
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 1) Frontier Institute for Biomolecular Engineering Research (FIBER) Konan University, 2) Graduate school of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University
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 1) Faculty of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University Kobe, Japan, 2) Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University Kobe, Japan
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 Department of Chemistry, Faculty of Science, Fukuoka University
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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
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Kazuki Kohata¹⁾, Naoki Sugimoto¹⁾²⁾, Daisuke Miyoshi¹⁾
 1) Faculty of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University, 2) Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University
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 Department of Applied Chemistry, University of Hyogo
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 Department of Applied chemistry, Faculty of Science, Tokyo University of Science
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Fumie Takei¹⁾, Misaki Akiyama¹⁾²⁾, Asako Murata²⁾, Akiko Sugai²⁾, Kazuhiko Nakatani²⁾, Ichiro Yamashita³⁾
 1) Department of Chemistry, National Defense Medical College (NDMC), 2) The Institute of Scientific and Industrial Research (ISIR), Osaka University, 3) Graduate School of Engineering, Osaka University
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 1) Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2) Institute for Materials Chemistry and Engineering, Kyushu University
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 1) Department of Chemistry and Interdisciplinary Program of Integrated Biotechnology, Sogang University, 2) Department of Chemistry, Graduate School of Science, Kyoto University
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 Department of Chemistry, Interdisciplinary Program of Integrated Biotechnology, Sogang University
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 1) Chemistry of Functional Molecules, Graduate School of Biomedical Sciences, Nagasaki University, 2) PRESTO • JST, 3) Graduate School of Health Sciences, Gunma University, 4) The Institute of Scientific and Industrial Research, Osaka University, 5) Institute of Multi-disciplinary Research for Advanced Materials, Tohoku University
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 Department of Chemistry, Graduate School of Engineering Science, Osaka University
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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences, Institute for Advanced Study, Kyoto University, 3) Medical Research Support Center, Graduate School of Medicine, Kyoto University
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 1) TriLink BioTechnologies, LLC, 2) Synthetic Genomics, Inc.
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 Department of Chemistry and Interdisciplinary Program of Integrated Biotechnology, Sogang University
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 Institute of Advanced Energy, Kyoto University
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 Division of Materials Science, Faculty of Advanced Science and Technology, Kumamoto University
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 1) Department of Chemistry, Graduate School of Science, Nagoya university, 2) JST CREST "Large-Scale Genome Synthesis and Cell Programming"
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Hidehito Urata¹, Tatsuya Funai¹, Chizuko Tagawa¹, Akira Ono², Shun-ichi Wada¹
 1) Department of Bioorganic Chemistry, Osaka University of Pharmaceutical Sciences, 2) Department of Material & Life Chemistry, Faculty of Engineering, Kanagawa University, Japan
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Yuuichi Orimoto¹, Anna Pomogaeva¹⁾², Ayaka Yano³, Kazuhiko Nakatani³, Yuriko Aoki¹
 1) Department of Material Sciences, Faculty of Engineering Sciences, Kyushu University, 2) Institute of Chemistry, St. Petersburg State University, Russia, 3) The Institute of Scientific and Industrial Research, Osaka University, Japan
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 1) Doctoral Program in Chemistry, Graduate School of Pure and Applied Sciences, University of Tsukuba, 2) Grad.Sch.Sci.Eng., Shimane Univ., 3) Food Research Institute, NARO

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 1) Graduate School of Science and Technology, Sophia University, 2) Faculty of Science and Technology, Sophia University, 3) Faculty of Engineering, Kanagawa University
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 1) Graduate School of Science and Technology, Sophia University, 2) Faculty of Engineering, Kanagawa University
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Hiromi Takahashi, Jiro Kondo
 Graduate School of Science and Technology, Sophia University
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 1) Frontier Institute for Biomolecular Engineering Research, Konan University, 2) Department of Biophysics, Molecular Biology and Bioinformatics, University of Calcutta, 3) Graduate School of Frontiers of Innovative Research in Science and Technology, Konan University
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 1) Department of Chemistry, Graduate School of Science, Nagoya University, 2) Graduate School of Frontier Sciences, The University of Tokyo, 3) National Institutes for Quantum and Radological and Technology, 4) JST CREST "Large-Scale Genome Synthesis and Cell Programming"
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 The Institute of Scientific and Industrial Research, Osaka University
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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
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 1) Department of Chemistry, Kyushu Institute of Technology, 2) Research Center for Bio-microsensing Technology
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 1) Department of Chemistry, Graduate School of Science, Nagoya University, 2) Research Center for Materials Science, Nagoya University

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 1) Department of Life and Environmental Sciences, Chiba Institute of Technology, 2) Veritas In Silico Inc.
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 1) The Institute of Science and Industrial Research, Osaka University, 2) Department of Neurology, Graduate School of Medicine, Osaka University
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 1) Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, 2) Department of Material & Life Chemistry, Faculty of Engineering, Kanagawa University, 3) Department of Materials and Life Sciences, Faculty of Science and Technology, Sophia University
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 1) Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, 2) Department of Material & Life Chemistry, Faculty of Engineering, Kanagawa University
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 1) Graduate School of Life Science, Hokkaido University, 2) Faculty of Advanced Life Science, Hokkaido University
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 1) Department of Biomolecular Engineering, Graduate School of Engineering, Nagoya University, 2) School of Food Science and Technology, Ocean University of China

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 Nucleic Acid Chemistry and Engineering Unit, Okinawa Institute of Science and Technology Graduate University
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 1) Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University, 2) Graduate school of Frontiers of Innovative Research in Science and Technology (FIRST), Konan University
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 1) Graduate School of Engineering, Kyushu Institute of Technology, 2) RCBT
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 Department of Biotechnology and Life Science, Tokyo University of Agriculture and Technology
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 1) Affiliation : Department of Biotechnology and Life Science, Graduate School of Engineering, Tokyo University of Agriculture and Technology, 2) School of Pharmaceutical Sciences, University of Shizuoka
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 1) Department of Biotechnology and Life Science, Graduate School of Engineering, Tokyo University of Agriculture and Technology, 2) Department of Developmental Medicine, Research Institute, Osaka Women's and Children's Hospital, 3) Department of Maternal-Fetal Biology, National Center for Child Health and Development
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 Department of Biological Engineering, College of Engineering, Konkuk University
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 1) Graduate School of Science and Technology, Gunma University, 2) Graduate School of Integrated Basic Sciences, Nihon University, 3) National Institutes of Biomedical Innovation, Health and Nutrition, 4) Graduate School of Pharmaceutical Sciences, Osaka University
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Fumiaki Tomoike¹⁾, Seiichi Tada²⁾, Yoshihiro Ito²⁾, Hiroshi Abe¹⁾²⁾³⁾
 1) Department of Chemistry, Graduate School of Science, Nagoya University, 2) RIKEN Center for Emergent Matter Science, 3) JST CREST "Large-Scale Genome Synthesis and Cell Programming"

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Yuki Suzuki¹⁾²⁾, Kohei Mizuno²⁾, Ibuki Kawamata²⁾, Satoshi Murata²⁾
 1) Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, 2) Department of Robotics, Graduate School of Engineering, Tohoku University
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 Yasuaki Kimura¹⁾, Seiichi Tada³⁾, Yoshihiro Ito³⁾, Hiroshi Abe¹⁾³⁾⁴⁾
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Hiroya Nakauchi¹⁾, Mizuo Maeda²⁾³⁾, Naoki Kanayama³⁾
 1) Department of Biomedical Engineering, Graduate School of Science and Technology, Shinshu University, 2) Bioengineering Laboratory, RIKEN Cluster of Pioneering Research, RIKEN, 3) Graduate School of Medicine, Science and Technology, Shinshu University
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 1) Department of Chemistry and Biotechnology, Graduate School of Engineering, The University of Tokyo, 2) Research Center for Advanced Science and Technology
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 1) Department of Chemistry, Graduate School of Science, Kyoto University, 2) Institute for Integrated Cell-Material Sciences, Kyoto University
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 Department of Chemistry, Materials Engineering Faculty of Chemistry, Materials and Bioengineering Kansai University
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Tsuyoshi Yamamoto¹⁾²⁾, Motoki Sawamura²⁾³⁾, Satoshi Obika²⁾, Mariko Harada-Shiba³⁾
 1) Graduate School of Biomedical Sciences, Nagasaki University, 2) Graduate School of Pharmaceutical Sciences, Osaka University, 3) Department of Molecular Innovation in Lipidology, National Cerebral and Cardiovascular Center Research Institute
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 Graduate School of Pharmaceutical Science, Tokushima University
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Erik B. Pedersen¹⁾, Susanne Coggi²⁾, Ulla Jacobsen¹⁾, Luigi E. Xodo²⁾, Stefan Vogel¹⁾
 1) Department of Physics, Chemistry and Pharmacy, University of Southern Denmark, 2) Department of Medical and Biological Sciences, University of Udine

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1) Department of material & life chemistry, Faculty of engineering, Kanagawa University, 2) Faculty of Science and Technology, Department of Materials and Life Sciences, Sophia University
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Yuko Nakashima¹⁾, Mitsutoshi Setou¹⁾²⁾³⁾
1) Department of Cellular and Molecular Anatomy, Hamamatsu University School of Medicine, 2) Preeminent Medical Photonics Education & Research Center, 3) Department of Anatomy, The University of Hong Kong
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Department of Materials and Life Chemistry, Kanagawa University
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Graduate school of pharmaceutical sciences Kyushu University
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Moe Hirosawa¹⁾²⁾, Yoshihiko Fujita²⁾, Hirohide Saito²⁾
1) Graduate School of Medicine, Kyoto University, 2) Department of Life Science Frontiers, Center for iPS Cell Research and Application, Kyoto University

Abstract

Invited Lecture

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Oral Presentations

Poster Presentations

Visualization of DNA Sequences with TAMRA-polypyrrole

Seonghyun Lee¹, Yusuke Kawamoto², Hiroshi Sugiyama², Kyubong Jo¹,

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ABSTRACT

Fluorophore-linked, sequence-specific DNA binding reagents can visualize sequence information on a large DNA molecule. Newly designed TAMRA-linked polypyrrole can visualize adenine and thymine base pairs on the DNA backbone. A fluorescent image of the stained DNA molecule generates an intensity profile based on A/T frequency, revealing a characteristic sequence composition pattern. Computer-aided comparison of this intensity pattern with the genome sequence allowed us to determine the DNA sequence on a visualized DNA molecule from possible intensity profile pattern candidates for a given genome. Moreover, TAMRA-polypyrrole offers robust advantages for single DNA molecule detection: no fluorophore-mediated photocleavage and no structural deformation, since it exhibits a sequence-specific pattern alone without the use of intercalating dyes such as YOYO-1. Accordingly, it is plausible to identify genomic DNA fragments from *E. coli* cells by aligning them to the genomic A/T frequency map based on TAMRA-polypyrrole-generated intensity profiles.

INTRODUCTION

Direct visualization of individual DNA molecules is powerful because it allows us to understand biochemical events within the context of the DNA sequence. Although sequencing technology at the single nucleotide level has advanced dramatically and become less expensive, numerous unsolved biological problems remain that are limited by short read length and information loss within a large genome. The ultimate goal of DNA analysis would be to obtain sequence and epigenetic information directly from chromosomal DNA without fragmentation or amplification. Given these concerns, single large DNA molecules are a promising platform to overcome the limitations of current sequencing technology.

RESULTS AND DISCUSSION

We synthesized a newly designed fluorophore-linked polypyrrole, TAMRA- β_2 -Py₄- β -Py₄-Dp, to stain individual large DNA molecules with A/T-specificity. This reagent successfully allowed the visualization of specific fluorescence intensity patterns along DNA backbones that represented the A/T frequency. Importantly, this staining reagent overcame the undesirable features of YOYO-1, including DNA structural deformation and DNA cleavage. We demonstrated its use on tethered and surface-immobilized DNA molecules with novel, robust activity. Therefore, we applied it to large genomic DNA fragments from *E.*

coli cells. Using a Python program to compare intensity profiles based on the cross-correlation coefficient, we identified DNA fragments by aligning them with the genomic A/T frequency map. Finally, we used TAMRA-polypyrrole to stain large polytene chromosomal DNA to depict the band and interband patterns on a fluorescence microscope.

CONCLUSION

Our newly designed TAMRA-polypyrrole specifically stained AT-rich regions and exhibited distinct fluorescence intensity patterns on DNA backbones. TAMRA-polypyrrole staining generated specific patterns that allowed the interpretation of most DNA images to depict molecular direction or stretching rates. Moreover, a sequence-specific pattern provides an alternative method to determine the DNA sequence from a microscopic image of a DNA fragment if given the full sequence. Further, TAMRA-polypyrrole works better than DAPI and Hoechst dyes for staining large polytene chromosomal DNA to depict the band and interband patterns by fluorescence microscopy

REFERENCES

1. Lee S, Kawamoto Y, Thangavel V, Park J, Bae J, Kim-Ha J, Sugiyama H, Jo K, *Nucleic Acids Research*, **2018**, DOI: 10.1093/nar/gky531, “TAMRA-Polypyrrole for A/T Sequence Visualization on DNA Molecules”.

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ISNAC2018 Program at a Glance

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		9:20 ~ 10:20 Oral Presentations 9:20 20-01 Kinuko Ueno 9:35 20-02 Kane McQuaid 9:50 20-03 Chao-Da Xiao 10:05 20-04 Ibuki Kawamata	9:20 ~ 10:20 Oral Presentations 9:20 30-01 Saulius Klimašauskas 9:35 30-02 Kiyohiko Kawai 9:50 30-03 Atsushi Maruyama 10:05 30-04 Vladimír Sychrovský
10:00	9:55 ~ 10:00 Opening Remarks 10:00 ~ 11:15 Oral Presentations 10:00 10-01 Yasuaki Kimura 10:15 10-02 Hisao Saneyoshi 10:30 10-03 Takehiko Wada 10:45 10-04 Dmitry Stetsenko 11:00 10-05 Pachamuthu Kandasamy		
		10:20 ~ 10:40 Break	10:20 ~ 10:40 Break
11:00	11:15 ~ 11:35 Break 11:35 ~ 12:15 Invited Lecture IL-01 Kyubong Jo	10:40 ~ 11:20 Invited Lecture IL-03 Nils G. Walter	10:40 ~ 11:20 Invited Lecture IL-04 Sébastien Lyonnais
12:00		11:20 ~ 12:05 Oral Presentations 11:20 20-05 Yudai Yamaaki 11:35 20-06 Lei Wang 11:50 20-07 Wenqing Liao	11:20 ~ 12:20 Oral Presentations 11:20 30-05 Akinori Kuzuya 11:35 30-06 Fangwei Shao 11:50 30-07 Hidetaka Torigoe 12:05 30-08 Eiji Nakata
	12:15 ~ 13:15 Lunch Break	12:05 ~ 13:05 Lunch Break	12:20 ~ Closing Remarks
13:00	13:15 ~ 14:45 Poster Presentations (Odd Numbers) Venue: International Conference Hall (2F)	13:05 ~ 14:35 Poster Presentations (Even Numbers) Venue: International Conference Hall (2F)	
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15:00	14:45 ~ 16:15 Oral Presentations 14:45 10-06 Hongliang Bao 15:00 10-07 Hiromu Kashida 15:15 10-08 Kazuma Murakami 15:30 10-09 Tingting Zou 15:45 10-10 Yihuan Lu 16:00 10-11 Hiroki Kanazawa		
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17:00	17:15 ~ 18:30 Oral Presentations 17:15 10-12 Yoshiya Ikawa 17:30 10-13 P.I. Pradeepkumar 17:45 10-14 Ye Teng 18:00 10-15 Hirotaka Murase 18:15 10-16 Kazuhito Tanabe	17:25 ~ 17:55 Special Lecture SL-01 Akira Matsuda 17:55 ~ 18:25 Special Lecture SL-02 Mitsuo Sekine	
18:00		18:30 ~ 20:30 Exchange Meeting Venue: International Conference Hall (2F)	
19:00			