

The 90th Anniversary Meeting

The Society for Biotechnology, Japan

International Symposium on
BIOTECHNOLOGY FOR

GREEN GROWTH Program

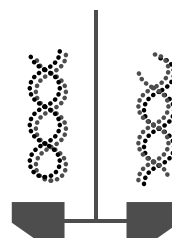
October 24-26, 2012

Kobe, Japan

Organized by

The Society for Biotechnology, Japan (SBJ)

Japan Science and Technology Agency (JST)



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Suntory Institute for Bioorganic Research

10/24 (Wednesday)

Advances in PhytoGenomics

Organizers: Toshiya MURANAKA (Osaka University)
Kiichi FUKUI (Osaka University)

Chairperson: Kiichi FUKUI (Osaka University)

9:00– 9:25	2Fa01	Functional chromosome dynamics with a link to synthetic green biotechnology ○Ingo SCHUBERT (Department of Cytogenetics and Genome Analysis, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Germany)
9:25– 9:45	2Fa02	Manipulation of plant traits using novel gene silencing system, CRES-T (Chimeric REpressor gene Silencing Technology) ○Nobutaka MITSUDA ¹ , Masaru OHME-TAKAGI ^{1,2} (¹ Bioproduction Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan, ² Institute for Environmental Science and Technology (IEST), Saitama University, Japan)
9:45– 10:05	2Fa03	A top-down approach to function the <i>Synechocystis</i> PCC6803 genome in a novel cloning host <i>Bacillus subtilis</i> 168 ○Mitsuhiro ITAYA (Institute for Advanced Biosciences, Keio University, Japan)

Chairperson: Toshiya MURANAKA (Osaka University)

10:05– 10:30	2Fa04	Decoding the chemical diversity and evolution written in the genomes of the Asteraceae ○Dae-Kyun RO ¹ , Don Trinh NGUYEN ¹ , Nobuhiro IKEZAWA ² , Vince QU ¹ (¹ Department of Biological Sciences, University of Calgary, Alberta, Canada, ² Department of Biotechnology, Osaka University, Japan)
10:30– 10:55	2Fa05	Cassava molecular breeding and functional genomics –Challenges and opportunities– ○Jarunya NARANGAJAVANA (Center for Cassava Molecular Biotechnology, Department of Biotechnology, Faculty of Science, Mahidol University, Bangkok, Thailand)
10:55– 11:15	2Fa06	KOMICS: metabolomics databases and tools for biotechnology ○Daisuke SHIBATA, Takeshi ARA, Hideyuki SUZUKI, Nozomu SAKURAI (Kazusa DNA Research Institute, Chiba, Japan)

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Chairperson: Kazuhito FUJIYAMA (Osaka University)

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| 11:15–
11:40 | 2Fa07 Dammarene-type ginsenoside metabolic engineering
–Characterization of genes involved in dammarenediol saponin biosynthesis–
Jung-Yeon HAN, ○Yong-Eui CHOI
(Department of Forest Resources, College of Forest and Environmental Science, Kangwon National University, South Korea) |
| 11:40–
12:00 | 2Fa08 Production of plant triterpenoids in engineered yeast
○Toshiya MURANAKA, Hikaru SEKI
(Department of Biotechnology, Graduate School of Engineering, Osaka University, Japan) |

Bio-Based Production**Organizers:** Hiroshi SHIMIZU (Osaka University)
Eiichiro FUKUSAKI (Osaka University)**Chairperson:** Hiroshi SHIMIZU (Osaka University)

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| 13:50–
14:20 | 2Ap01 Living microbes as selective and efficient redox biocatalysts
○Andreas SCHMID, Katja BÜHLER, Mattijs JULLSING, Bruno BÜHLER
(Laboratory of Chemical Biotechnology, TU Dortmund University, Germany) |
| 14:20–
14:50 | 2Ap02 Toward biological replacement of petroleum
○James C. LIAO
(Department of Chemical and Biomolecular Engineering, University of California, Los Angeles, USA) |
| 14:50–
15:20 | 2Ap03 <i>Bacillus subtilis</i> cell factory for production of <i>scyllo</i> -inositol promising for Alzheimer's disease
○Ken-ichi YOSHIDA ¹ , Chumsakul ONUMA ² , Shu ISHIKAWA ² , Naotake OGASAWARA ²
(¹ Department of Agrobioscience, Graduate School of Agricultural Science, Kobe University, Japan, ² Graduate School of Biological Sciences, Nara Institute of Science and Technology (NAIST), Japan) |
| 15:20–
15:50 | 2Ap04 Engineering of signal transduction for enhanced production of biopharmaceuticals and bioenergy
○Jian-Jiang ZHONG ¹ , Yang-Chun YONG ²
(¹ School of Life Sciences and Biotechnology, Shanghai Jiao Tong University, China, ² School of the Environment, Jiangsu University, China) |

15:50– 16:20	2Ap05 Synthetic biology for the comprehension of biomolecular networks ○Masahiro OKAMOTO ^{1,2} (1 Department of Bioinformatics, Graduate School of Systems Life Sciences, Kyushu University, Japan, 2 Synthetic Systems Biology Research Center (SSBRC), Kyushu University, Japan)
16:20– 16:30	BREAK

Chairperson: Eiichiro FUKUSAKI (Osaka University)

16:30– 17:00	2Ap06 Strategies and technologies towards tailor made fuels from biomass ○Jochen BUECHS ¹ , Tobias KLEMENT ¹ , Martin KUNZE ¹ , Gernot JAEGER ¹ , Sandra WEWETZER ¹ , Frederike CARSTENSEN ² , Matthias WESSLING ² , Philipp GRANDE ³ , Pablo Domínguez DE MARIA ³ , Antje SPIESS ⁴ (1 AVT - Biochemical Engineering, RWTH Aachen University, Germany, 2 AVT - Chemical Process Engineering, RWTH Aachen University, Germany, 3 Institute of Technical and Macromolecular Chemistry, RWTH Aachen University, Germany, 4 AVT - Enzyme Process Technology, RWTH Aachen University, Germany)
17:00– 17:30	2Ap07 Actinobacteria tyrosinase and its applications to biomaterials ○Byung-Gee KIM ^{1,2,3} , Nahum LEE ^{1,3} , SangHyuk LEE ^{2,3} , ChangHyun SONG ^{1,3} (1 School of Chemical and Biological Engineering, Seoul National University, Korea, 2 Institute of Molecular Biology and Genetics, Seoul National University, Korea, 3 Institute of Bioengineering, Seoul National University, Korea)
17:30– 18:00	2Ap08 Cyberinfrastructure for metabolomics and synthetic biology ○Masanori ARITA ^{1,2} (1Department of Biophysics and Biochemistry, Graduate School of Science, The University of Tokyo, Japan, 2 RIKEN Plant Science Center, Japan)
18:00– 18:30	2Ap09 Bioprocess engineering on biofuels and bio-based chemicals production from microalgae ○Jo-Shu CHANG ^{1,2,3} , Chun-Yen CHEN ² (1Department of Chemical Engineering, National Cheng Kung University, Taiwan, 2Center for Bioscience and Biotechnology, National Cheng Kung University, Taiwan, 3Research Center for Energy Technology and Strategy, National Cheng Kung University, Taiwan)

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18:30–
19:00**2Ap10** Systems metabolic engineering –Rational design of microbial cell factories

○Hiroshi SHIMIZU¹, Chikara FURUSAWA^{1,2}, Takashi HIRASAWA¹, Naoaki ONO³, Katsunori YOSHIKAWA¹, Yoshihiro TOYA¹

(¹ Department of Bioinformatic Engineering, Osaka University, Japan, ² Quantitative Biology Center (QBiC), RIKEN, Japan, ³ Graduate School of Information Science, Nara Institute of Science and Technology (NAIST), Japan)

10/25 (Thursday)**Biomolecular Engineering [co-organized by Young Asian Biochemical Engineers' Community (YABEC)]**

Organizers: Takeshi OMASA (University of Tokushima)
Noriho KAMIYA (Kyushu University)

Chairperson: Takeshi OMASA (University of Tokushima)

9:00– 9:30	3Fa01	Reaction evaluation and new process design in composting of biological wastes~Young Asian Biotechnologist Prize~ ○Jingchun TANG ¹ , Arata KATAYAMA ² (¹ College of Environmental Science and Engineering, Nankai University, China, ² EcoTopia Science Institute, Nagoya University, Japan)
9:30– 9:40		BREAK

Chairperson: Noriho KAMIYA (Kyushu University)

9:40– 10:05	3Fa02	Organic solvent stable enzymes ○Hiroyasu OGINO (Department of Chemical Engineering, Osaka Prefecture University, Japan)
10:05– 10:30	3Fa03	Engineering of aminoacyl-tRNA synthetases for residue-specific incorporation of amino acid analogues into proteins ○Tae Hyeon YOO (Department of Molecular Science and Technology, Department of Applied Chemistry and Biological Engineering, Ajou University, Korea)
10:30– 10:55	3Fa04	Production of the bio-butanol based on the continuous in situ fermentation and adsorption (ISFA) technology ○Hanjie YING ^{1,2} , Yong CHEN ^{2,3} , Jinglan WU ^{2,3} (¹ State Key Laboratory of Materials-Oriented Chemical Engineering, China, ² College of Biotechnology and Pharmaceutical Engineering, Nanjing University of Technology, China, ³ National Engineering Technique Research Center for Biotechnology, China)

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Chairperson: Takeshi OMASA (University of Tokushima)

10:55– 11:20	3Fa05 Genomic engineering as a new technology platform for metabolic engineering of microorganisms ○Yun-Peng CHAO ¹ , Chung-Jen CHIANG ² , Po Ting CHEN ³ (1Department of Chemical Engineering, Feng Chia University, Taiwan, 2Department of Medical Laboratory Science and Biotechnology, China Medical University, Taiwan, 3Department of Biotechnology, Southern Taiwan University, Taiwan)
11:20– 11:45	3Fa06 Enzyme engineering with the aid of ionic liquids ○Noriho KAMIYA ^{1,2} (1Center for Future Chemistry, Kyushu Univeristy, Japan, 2Department of Applied Chemistry, Graduate School of Engineering, Kyushu University, Japan)

SBJ/JST Joint Symposium I –General Session–

Organizers: Tadashi MATSUNAGA (Tokyo University of Agriculture and Technology)
 Hisao OHTAKE (Osaka University)
 Shigeru ISHIMASA (JST)

Chairperson: Kohsuke HONDA (Osaka University)

14:00– 14:05	Welcome adress ○Hisao OHTAKE (Department of Biotechnology, Graduate School of Engineering, Osaka University, Japan)
14:05– 14:15	3Ap01 Introduction of the JST CREST/PRESTO program research area “Creation of basic technology for improved bioenergy production through functional analysis and regulation of algae and other aquatic microorganisms” ○Tadashi MATSUNAGA (Tokyo University of Agriculture and Technology, Japan)

Chairperson: Masafumi YOHDA (Tokyo University of Agriculture and Technology)

14:15– 14:50	3Ap02 Can biotechnology address the global energy crisis? ○Jonathan D. TRENT ^{1,2} (1 Bioengineering Branch, NASA Ames Research Center, USA, 2 Biomolecular Engineering, University of California Santa Cruz, USA)
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Chairperson: Akira SATO (Yamaha Motor, Co.)

14:50– 15:25	3Ap03 Food and fuel from microalgae: Integration of photosynthesis and photovoltaics allows to achieve a positive energy balance of algae biomass production ○Mario R. TREDICI (University of Florence, Italy)
15:25– 15:35	BREAK

Chairperson: Tsuyoshi TANAKA (Tokyo University of Agriculture and Technology)

15:35– 16:10	3Ap04 Biorefinery of microalgae ○René H. WIJFFELS (Wageningen University, Bioprocess Engineering, the Netherlands)
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Chairperson: Kohsuke HONDA (Osaka University)

16:10– 16:20	Closing remarks ○Shigeru ISHIMASA (Japan Science and Technology Agency (JST), Japan)
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Japan-Korea Biomass Session

Organizers: Atsuhiko SHINMYO (Nara Institute of Science and Technology)
Shigeaki FUJIKAWA (NPO Kinki Bio-Industry Development Organization)

Chairperson: Shigeaki FUJIKAWA (NPO Kinki Bio-Industry Development Organization)

16:40– 16:45	Opening remarks ○Atsuhiko SHINMYO (Nara Institute of Science and Technology, Japan)
16:45– 17:05	3Ap05 Improvement of ethanol yield from xylose by breeding of industrial yeast ○Haruyo HATANAKA, Tomohide MAEDA, Yuri YASUE, Kazue NISHIYAMA (Suntory Business Expert Limited, Institute for Microbial Science, Japan)

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17:05– 17:25	3Ap06 Applications of microbial factory technology to production of bioethanol from cellulosic biomass Jung-Hyun JO ¹ , Sang-Min JUNG ¹ , Yong-Cheol PARK ² , Yong-Su JIN ³ , ○Jin-Ho SEO ¹ (¹ Department of Agricultural Biotechnology, Seoul National University, Korea, ² Department of Advanced Fermentation Fusion Science and Technology, Kookmin University, Korea, ³ Department of Food Science and Human Nutrition, University of Illinois at Urbana-Champaign, USA)
17:25– 17:45	3Ap07 Potential in bioethanol production from waste paper sludge in pulp-based biorefinery ○Enoch Y. PARK ^{1,2} , Joni PRASETYO ¹ , Kazuya NARUSE ² , Tatsuya KATO ² (¹ Laboratory of Biotechnology, Graduate School of Science and Technology, Shizuoka University, Japan, ² Laboratory of Biotechnology, Faculty of Agriculture, Shizuoka University, Japan)
17:45– 17:55	BREAK

Chairperson: Moon-Hee SUNG (Kookmin University)

17:55– 18:15	3Ap08 Application of Metabolomics to high resolution phenotype analysis ○Eiichiro FUKUSAKI (Department of Biotechnology, Graduate School of Engineering, Osaka University, Japan)
18:15– 18:35	3Ap09 Biological production of 3-hydroxypropionic acid from glycerol ○Sunghoon PARK (School of Chemical and Biomolecular Engineering, Pusan National University, Korea)
18:35– 18:55	3Ap10 Biodiesel production by enzymatic process and the utilization of crude glycerol Hah Young YOO, Laxmi Prasad THAPA, Ja Hyun LEE, Sang Jun LEE, ○Seung Wook KIM (Department of Chemical and Biological Engineering, Korea University, Korea)
18:55– 19:00	Closing remarks ○Sunghoon PARK (Pusan National University, Korea)

10/26 (Friday)**SBJ/JST Joint Symposium II –Biorefinery–**

Organizers: Haruko TAKEYAMA (Waseda University)
Yoshihiro SHIRAIWA (Tsukuba University)

Chairperson: Haruko TAKEYAMA (Waseda University)

9:00– 9:25	4Aa01 Understanding and altering the unique metabolism of hyperthermophilic archaea ○Haruyuki ATOMI ^{1,2} , Kunio MIKI ^{2,3} , Tadayuki IMANAKA ^{2,4} (¹ Department of Synthetic Chemistry and Biological Chemistry, Graduate School of Engineering, Kyoto University, Japan, ² CREST, Japan Science and Technology Agency (JST), ³ Department of Chemistry, Graduate School of Science, Kyoto University, Japan, ⁴ Department of Biotechnology, College of Life Sciences, Ritsumeikan University, Japan)
9:25– 9:50	4Aa02 Blue ocean for blue biotechnology – Marine bioenergy production ○Choul-Gyun LEE ^{1,2} (¹ Department of Biotechnology, Inha University, Korea, ² Korea National Consortium on Marine Bioenergy Research)
9:50– 10:15	4Aa03 Establishment of innovative technology to create new microalgal strains increasing biofuel production by polyploidization and heavy-ion beam irradiation ○Shigeyuki KAWANO ^{1,2} , Koichi WATANABE ^{1,2} , Shuhei OTA ^{1,2} (¹ Department of Integrated Biosciences, Graduate School of Frontier Sciences, The University of Tokyo, Japan, ² CREST, Japan Science and Technology Agency (JST), Japan)
Chairperson: Yoshihiro SHIRAIWA (Tsukuba University)	
10:15– 10:40	4Aa04 New dimensions in microalgae biomass production for bioenergy ○Otto PULZ (IGV, Nuthetal, Germany)
10:40– 10:45	BREAK

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Chairperson: Yoshihiro SHIRAIWA (Tsukuba University)

10:45–
11:10

4Aa05 Development of sustainable biorefinery based on microalgae
○Akihiko KONDO^{1,2}
(¹Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan, ²Core Research for Evolutional Science and Technology (CREST), Japan Science and Technology Agency (JST), Japan)

11:10–
11:35

4Aa06 *Chlamydomonas reinhardtii* - A powerful host for the production of biofuels and high value products
○Olaf KRUSE
(Bielefeld University, Department of Biology/ Center for Biotechnology, Algae Biotechnology & Bioenergy Group, Germany)

Chairperson: Haruko TAKEYAMA (Waseda University)

11:35–
12:00

4Aa07 Alkenone biosynthesis by marine Haptophytes as biorefinery for renewable energy production
○Yoshihiro SHIRAIWA^{1,2}
(¹Faculty of Life & Environmental Sciences, University of Tsukuba, Japan, ²CREST, Japan Science and Technology Agency (JST), Japan)

SBJ/JST Joint Symposium III –Biofuel Production by Microalgae–

Organizers: Masayuki OHMORI (Chuo University)
Shigeru OKADA (The University of Tokyo)

Chairperson: Masayuki OHMORI (Chuo University)

14:00–
14:20

4Ap01 Characterization of hydrocarbon biosynthesis and secretion mechanisms by the green microalga, *Botryococcus braunii* to control biofuel production
○Shigeru OKADA^{1,5}, Ikuro ABE^{2,5}, Tetsuko NOGUCHI^{3,5}, Takeshi OHAMA^{4,5}
(¹Department of Aquatic Biosciences, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan, ² Graduate School of Pharmaceutical Sciences, The University of Tokyo, Japan, ³ Department of Biological Sciences, Faculty of Science, Nara Women's University, Japan, ⁴ Department of Environmental Systems Engineering, Kochi University of Technology, Japan, ⁵CREST, Japan Science and Technology Agency (JST), Japan)

14:20– 14:55	4Ap02 Metabolic engineering of cyanobacteria for the light-powered production of hydrogen from water ○Matthias RÖGNER (Plant Biochemistry, Faculty of Biology & Biotechnology, Ruhr-University Bochum, Germany)
14:55– 15:15	4Ap03 Selection strategies for the promising microalgal strains for algae-fuel production ○Hideaki MIYASHITA ¹ , Norihide KURANO ² (¹ Department of Interdisciplinary Environment, Graduate School of Human and Environmental Studies, Kyoto University, Japan, ² Research laboratories, DENSO CORPORATION, Japan)
15:15– 15:25	BREAK

Chairperson: Shigeru OKADA (The University of Tokyo)

15:25– 16:00	4Ap04 Elucidation of novel triterpene pathways in <i>Botryococcus</i> and engineering plants for high-value oil production Tom D. NIEHAUS ¹ , Scott KINISON ¹ , Shigeru OKADA ² , Shuiqin WU ¹ , Timothy P. DEVARENNE ³ , David S. WATT ⁴ , Vitaliy SVIRIPA ⁴ , ○Joe CHAPPELL ¹ (¹ Plant Biology Program, University of Kentucky, USA, ² Department of Aquatic Biosciences, University of Tokyo, Japan, ³ Department of Biochemistry and Biophysics, Texas A&M University, USA, ⁴ Department of Cellular and Molecular Biochemistry, University of Kentucky, USA)
16:00– 16:20	4Ap05 The Cyanofactory™~ a novel cyanobacterial bioprocess based on the synthetic biology concept ~ ○Koji SODE ^{1,2} (¹ Tokyo University of Agriculture & Technology, Japan, ² Japan Science and Technology Agency, CREST, Japan)

Fri 26, OCT

SBJ/JST Joint Symposium IV –System & Synthetic Biotechnology–

Organizers: Daisuke UMENO (Chiba University)
 Tomohisa HASUNUMA (Kobe University)
 Kohsuke HONDA (Osaka University)

Chairperson: Daisuke UMENO (Chiba University)

16:40– 17:00	4Ap06 Bio-refinery from microalgae through fermentation and metabolic engineering ○Tomohisa HASUNUMA ^{1,2} (¹ Organization of Advanced Science and Technology, Kobe University, Japan, ² PRESTO, Japan Science and Technology Agency (JST), Japan)
17:00– 17:35	4Ap07 Synthetic biology approaches to produce C3-C5 alcohols from microorganisms ○Shota ATSUMI (Department of Chemistry, University of California Davis, USA)
17:35– 17:55	4Ap08 Synthetic metabolic engineering –A novel, simple technology for designing a chimeric metabolic pathway– ○Kohsuke HONDA ^{1,2} , Xiaoting YE ¹ , Kenji OKANO ¹ , Hisao OHTAKE ¹ (¹ Department of Biotechnology, Graduate School of Engineering, Osaka University, Japan, ² PRESTO, Japan Science and Technology Agency (JST), Japan)
17:55– 18:05	BREAK

Chairperson: Tomohisa HASUNUMA (Kobe University)

18:05– 18:40	4Ap09 Production of Biolsoprene™ monomer ○Derek H. WELLS (Du Pont Industrial Biosciences, USA)
18:40– 19:00	4Ap10 Evolutionary pathway engineering: toward the fast-track construction of long-step, but high-fidelity pathway for non-natural compounds ○Daisuke UMENO ^{1,2} , Maiko FURUBAYASHI ¹ , Kyoichi SAITO ¹ (¹ Department of Applied Chemistry and Biotechnology, Graduate School of Engineering, Chiba University, Japan, ² PRESTO, Japan Science and Technology Agency (JST), Japan)