

**2nd Asia-Oceania International Congress on
Photosynthesis (AOICP)**

Wednesday 18th – Saturday 21st, September, 2024

Kobe Fashion Mart, Japan

SPONSORS

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The Japanese Society of Photosynthesis Research (JSPR)
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GREETINGS FROM THE CHAIR

The 2nd Asia-Oceania International Congress on Photosynthesis (2nd AOICP) is held in Kobe Fashion Mart from 18, September (Wednesday) to 21, September (Saturday), 2024. It is our great pleasure to invite all of you to participate and present your latest research results in this exciting congress.

Photosynthesis research is becoming increasingly important in the era of climate change, as our modern life depends on photosynthesis in terms of food, oxygen and fossil fuels, and researches into the mechanisms of photosynthesis may provide important clues to mitigate the impact of climate change. Thus, it is important to bring active researchers and students together to discuss the current status and future perspectives in the field of photosynthesis research, and this congress will provide an excellent opportunity for such discussions.

This congress is the second in the series. The first one is held in 2018 in Beijing, China, following the decision of The International Society of Photosynthesis Research that the International Congress on Photosynthesis Research will be held every four years, and the Gordon Research Conference on Photosynthesis will be held every two years in the years different from the International Congress. This means that there will be a vacant year in every four years, and the International Society of Photosynthesis Research decided to held regional congresses in this vacant year. Due to the effect of COVID-19, this congress has been postponed; however, in 2024, the congress is finally held face-to-face in Japan. It is our hope that all of you will attend the congress, and join the discussions, exchange your ideas with colleagues from various countries, and enjoy the beautiful city and foods of Kobe and the traditional culture of Japan.

This congress is hosted by the Japanese Society of Photosynthesis Research, with the help of a number of parties listed in the web page. I would like to take this opportunity to thank all these parties for their supports.

With warmest regards,
Jian-Ren Shen
Chair of the 2nd AOICP

COMMITTEE

Cair: Jian-Ren Shen (Okayama University)

Secretary-general: Toshiharu Shikanai (Kyoto University)

General Affairs Secretary: Kentaro Ifuku (Kyoto University)

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Access to the Congress Venue

Suburbs Map

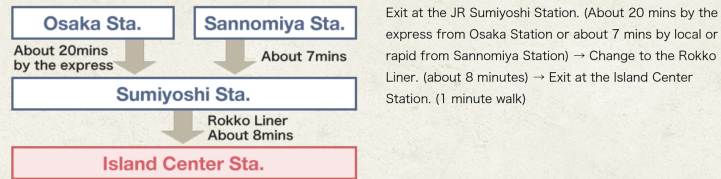
Map of Surrounding Area

Easy access to Rokko Island from Osaka, Sannomiya

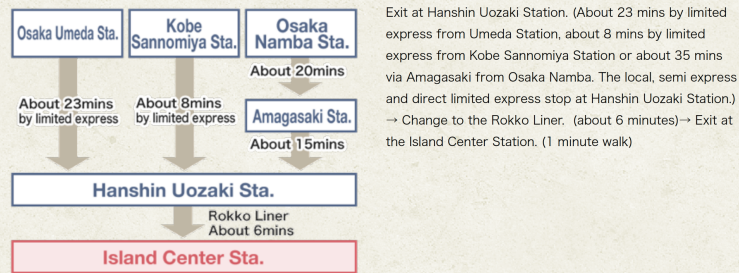
From Sannomiya	From Osaka
15mins by Car.	30mins by Car.
20mins by Train.	30mins by Train.

[Go to the Google Map](#)

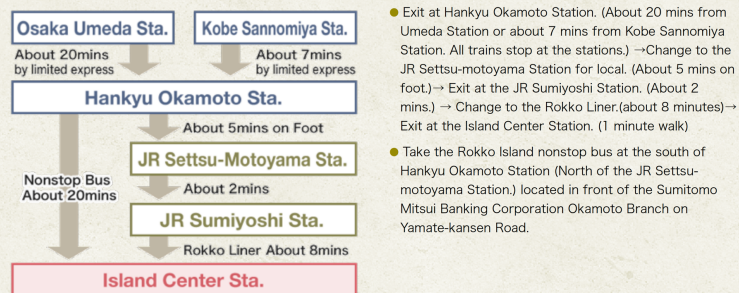
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See more information at <https://www.kfm.or.jp/en/access/>

Congress Floor Map

Kobe Fashion Mart 9F



ORAL PRESENTATIONS

Wednesday 18 September

Registration (Kobe Fashion Mart 9F)

13:00 –

Opening and Plenary Lecture I

KFM Hall <IO>

15:45 – 16:00 Opening remark by Jian-Ren Shen

16:00 – 16:40 [PL1] Mei Li (Institute of Biophysics, Chinese Academy of Sciences, China)

Structural basis for the photosynthetic cyclic electron transport

16:40 – 17:20 [PL2] Michi Suga (Research Institute for Interdisciplinary Science, Okayama

University, Japan)

Real-time structural changes during the S_1 - S_2 - S_3 state transitions of the Kok cycle of

Photosystem II caught by time-resolved crystallography

Welcome Mixer (Cafeteria)

17:30 – 19:30

Thursday 19 September

Plenary Lecture II

KFM Hall <IO>

9:00 – 9:40 [PL3] Maria Ermakova (School of Biological Sciences, Monash University, Australia)

Cell-specific cyclic electron flow pathways in C₄ photosynthesis

9:40 – 10:20 [PL4] Jun Minagawa (National Institute for Basic Biology, Japan)

State transition in green algae

Coffee Break (Cafeteria)

10:20 –

Poster Session 1

Exhibition Space 1-B and 3-A,B

10:40 – 12:00 Odd numbers after the hyphen

Lunch (Cafeteria)

12:00 – 13:00

Symposium [S1] “Light harvesting and photosynthetic electron transfer”

KFM Hall <IO>

Chairs: Kentaro Ifuku (Kyoto University, Japan) and Rajagopal Subramayam (University of Hyderabad, India)

13:00 – 13:30 [I1] Jayendra Pandey, Rajagopal Subramanyam (School of Life Sciences, University of Hyderabad, India)

Protein aggregation and changes in photosynthetic apparatus of pea (*Pisum sativum*) leaves under drought stress

13:30 – 14:00 [I2] Ryouichi Tanaka (Institute of Low Temperature Science, Hokkaido University, Japan)

The early light-induced protein hypothesis for sustained thermal dissipation in photosystem II of overwintering evergreen leaves

14:00 – 14:15 [O1-1] Eunchul Kim, Jun Minagawa (Division of Environmental Photobiology, National Institute for Basic Biology, Japan)

Regulatory factors and formation of photosystem megacomplexes [P1-14]

14:15 – 14:30 [O1-2] Minami Murai¹, Ayaka Kimura¹, Ko Imaizumi¹, Keisuke Yoshida², Kenta

Miura¹, Ko Takeuchi¹, Yufen Che³, Noriko Ishikawa¹, Toru Hisabori^{2,4}, Kaori Kohzuma¹, Kentaro Ifuku² (¹Grad. Sch. Agric., Kyoto Univ., Japan; ²CLS, Tokyo Tech.; ³Grad. Sch. Biostudies, Kyoto Univ.; ⁴IRFI, Tokyo Tech.)

Deregulation of the chloroplast NDH complex activity causes malfunction of photosystem II in *Arabidopsis pif1* mutants [P1-23]

14:30 – 14:45 [O1-3] Mengyuan Zheng^{1,2,3‡}, Xiaojie Pang^{1,2,3‡}, Ming Chen^{1,2}, Lijin Tian^{1,2,3*} (¹Institute of Botany, Chinese Academy of Sciences, China; ²China National Botanical Garden; ³University of Chinese Academy of Sciences)

Ultrafast energy quenching mechanism of LHCSR3-dependent photoprotection in *Chlamydomonas* [P1-33]

14:45 – 15:00 [O1-4] Toru Nakata, Mari Nakagawa, Mutsumi Kubushiro, Shigeru Kawai, Toshihiko Eki, Yuu Hirose (Department of Applied Chemistry and Life Science, Toyohashi Tech., Japan)

Characterization of diverse chromatic acclimation in Cyanobacteria [P1-46]

Symposium [S2] “Evolution of photosynthesis”

Exhibition Space 1-A

Chairs: Yuichi Fujita (Nagoya University, Japan) and Min Chen (University of Sydney, Australia)

13:00 – 13:30 [I3] Min Chen (School of life and environmental Sciences, The University of Sydney, Australia)

Evolution of far-red light photosynthesis

13:30 – 14:00 [I4] Oliver Mueller-Cajar (School of Biological Sciences, Nanyang Technological University Singapore, Singapore)

Biochemical aspects of convergent rubiscosome evolution

14:00 – 14:15 [O2-1] Arisa Nishihara¹, Yusuke Tsukatani², Chihiro Azai³, Masaru K. Nobu⁴ (¹Department of Life Science and Biotechnology, The National Institute of Advanced Industrial Science and Technology (AIST), Japan; ²Biogeochemistry Research Center, JAMSTEC; ³Faculty of Science and Engineering, Chuo University; ⁴Institute for Extra-Cutting-Edge Science and Technology Avant-Garde Research (X-star), Japan Agency for Marine-Earth Science and Technology (JAMSTEC))

Illuminating the co-evolution of photosynthesis and bacteria [P2-2]

14:15 – 14:30 [O2-2] Shigeru Kawai, Risa Tamagawa, Tatsuki Machida, Toshihiko Eki, Yuu Hirose (Department of Applied Chemistry and Life Science, Toyohashi University of Technology, Japan)

Comprehensive phylogenetic analysis reveals novel phycobiliprotein lineages in cyanobacteria [P2-6]

14:30 – 14:45 [O2-3] Minoru Kumazawa, Kentaro Ifuku (Graduate School of Agriculture, Kyoto University, Japan)

Novel insights into red-lineage LHCI evolution from protein complex structures and molecular phylogeny [P2-5]

14:45 – 15:00 [O2-4] Shinsa Kameo^{1,2}, Renon Matsumae², Ryouichi Tanaka^{1,2}, Atsushi Takabayashi^{1,2} (¹Grad. Sch. of Env. Sci, Hokkaido Univ, Japan; ²ILTS, Hokkaido Univ.)
The early branched streptophyte *Mesostigma viride*, shows zeaxanthin-dependent quenching ability [P2-4]

Coffee Break (Cafeteria)

15:00 – 15:30

Symposium [S3] “Structures and functions of bacterial photocomplexes”

KFM Hall <IO>

Chairs: Seiu Otomo (Ibaraki University, Japan) and Jian-Ping Zhang (Renmin University, China)

15:30 – 16:00 [I5] Jian-Ping Zhang (School of Chemistry and Life Resources, Renmin University of China, China)

Carotenoid triplet excitation dynamics in photosynthetic light-harvesting antennae

16:00 – 16:30 [I6] Meixia Ruan¹, Hao Li¹, Ying Zhang¹, Ruoqi Zhao², Jun Zhang², Yingjie Wang², Jiali Gao^{2,3}, Zhuan Wang¹, Yumei Wang¹, Dapeng Sun¹, Wei Ding¹, Yuxiang Weng¹ (¹Institute of Physics, Chinese Academy of Sciences, China; ²Institute of Systems and Physical Biology, Shenzhen Bay Laboratory, China; ³Department of Chemistry and Supercomputing Institute, University of Minnesota, USA)

Quantum switch reversibly regulating light harvesting and excess energy dissipation in photosynthesis

16:30 – 16:45 [O3-1] Xin Zhang¹, Jiyu Xin¹, Lu Yu^{2,4}, Jingyi Wu¹, Zhenzhen Min¹, Yueyong Xin³, Huimin He³, Aokun Liu², Jian Kuang⁴, Menghua Liu¹, Changlin Tian^{2,4}, Xiaoling Xu^{1,3} (¹School of Basic Medical Sciences, Hangzhou Normal University, China; ²Chinese Academy of Sciences; ³College of Life and Environmental Sciences, Hangzhou Normal University; ⁴Center for Bioanalytical Chemistry, Hefei National Laboratory of Physical Science at Microscale, University of Science and Technology of China)

Characterizing the photosynthetic electron transport chain of anoxygenic photosynthetic bacterium *Roseiflexus castenholzii* [P3-1]

16:45 – 17:00 [O3-2] Risa Kojima¹, Kevin E. Redding², Daisuke Kosumi³, Hirozo Oh-oka⁴ (¹College of Life Science, Ritsumeikan University, Japan; ²School of Molecular Sciences, Arizona State University, USA; ³Institute of Industrial Nanomaterials, Kumamoto

University, Japan; ⁴Center for Education in Liberal Arts and Sciences, Osaka University, Japan)

Comparisons of excitation energy transfer dynamics between the wild-type and $\Delta pshX$ reaction center complexes from *Heliomicrobium modesticaldum* [P3-2]

17:00 – 17:15 [O3-3] Jiro Harada¹, Hirozo Oh-oka², Ken Yamamoto¹, Hitoshi Tamiaki³

(¹Department of Medical Biochemistry, Kurume University School of Medicine, Japan; ²Graduate School of Science, Osaka University; ³Graduate School of Life Sciences, Ritsumeikan University)

C20-methyl group of bacteriochlorophylls *c* and *e* catalyzed by the methyltransferase BchU, working in their synthetic pathways [P3-4]

17:15 – 17:30 [O3-4] Yi-Hao Yan^{1,2}, Guang-Lei Wang^{1,2}, Zheng-Yu Wang-Otomo³, Long-Jiang Yu^{1,2*}

(¹Institute of Botany, Chinese Academy of Sciences, China; ²University of Chinese Academy of Sciences, China; ³Department of Microbiology, Southern Illinois University, USA; ⁴Faculty of Science, Ibaraki University, Japan) Molecular Structure and Characterization of the *Thermochromatium tepidum* light-harvesting 1 photocomplex produced in a foreign host [P3-5]

Symposium [S4] “Photosynthetic gene expression”

Exhibition Space 1-A

Chairs: Wataru Sakamoto (Okayama University, Japan) and Chanhong Kim (Shanghai Center for Plant Stress Biology, CEMPS, CAS, China)

15:30 – 16:00 [I7] Shan Qi^{1,2}, Chaojun Cui¹, Jieya Xia^{1,2}, Mengping Li¹, Chanhong Kim^{1,2}

(¹Shanghai Center for Plant Stress Biology, CEMPS, CAS, China; ²University of the Chinese Academy of Sciences, China)

Coordinated expression of photosynthesis-related genes: A crucial nexus for chloroplast biogenesis and adaptive plant stress responses

16:00 – 16:30 [I8] Xiao-Xian Wu¹, Wen-Hui Mu^{1,2}, Fan Li³, Shu-Yi Sun⁴, Chao-Jun Cui^{1,4,5},

Chanhong Kim⁵, Fei Zhou³, Yu Zhang¹ (¹Shanghai Institute of Plant Physiology and Ecology, CAS, China; ²School of Life Sciences, Henan University; ³National Key Laboratory of Crop Genetic Improvement and National Centre of Plant Gene Research, Huazhong Agricultural University; ⁴University of Chinese Academy of Sciences; ⁵Shanghai Center for Plant Stress Biology, CEMPS, CAS)

Cryo-EM structures of the plant plastid-encoded RNA polymerase

16:30 – 16:45 [O4-1] Takeshi Nakano¹, Ryo Tachibana¹, Susumi Abe², Momo Marugami²,

Ayumi Yamagami¹, Kentaro Ifuku¹, Tetsuo Kushiro³, Takuya Miyakawa¹, Tadao Asami⁴ (¹Graduate School of Biostudies, Kyoto University, Japan; ²RIKEN, CSRS; ³School of

Agriculture, Meiji University; ⁴Graduate School of Agricultural and Life Sciences, University of Tokyo)

Research for regulatory mechanism of chloroplast development via brassinosteroid signaling by using BR inhibitor Brz [P4-4]

16:45 – 17:00 [O4-2] Setsuko Wakao¹, Cailyn Sakurai², Vy Duong³, Sara Calhoun³, Krishna Niyogi^{1,2,4} (¹Lawrence Berkeley National Laboratory, Molecular Biophysics and Integrated Bioimaging Division, USA; ²University of California Berkeley, Plant and Microbial Biology Department; ³Lawrence Berkeley National Laboratory, Joint Genome Institute; ⁴Howard Hughes Medical Institute)

Gaining insight into the functions of unknown genes from the multi-omic signatures of photosynthetic mutants [P4-11]

17:00 – 17:15 [O4-3] Elena Carrasquer-Alvarez¹, Adrian Geissler², Jan Gorodkin², Stefan Seemann², Ute Hoffmann³, Paul Hudson³, Niels-Ulrik Frigaard¹ (¹Department of Biology, University of Copenhagen, Denmark; ²Department of Veterinary and Animal Sciences, University of Copenhagen, Denmark; ³Division of Systems Biology, KTH Royal Institute of Technology, Sweden)

Cyanobacteria on the edge: How very high CO₂ affects photosynthesis [P4-5]

17:15 – 17:30 [O4-4] Yuichi Fujita¹, Shintaro Hida¹, Marie Nishio¹, Kazuma Uesaka^{1,2}, Mari Banba¹, Nobuyuki Takatani¹, Shinichi Takaichi³, Haruki Yamamoto¹, Kunio Ihara² (¹Graduate School of Bioagricultural Sciences, Nagoya University, Japan; ²Center for Gene Research, Nagoya University; ³Department of Molecular Microbiology, Faculty of Life Sciences, Tokyo University of Agriculture)

Genome analysis of dark-adapted variants of the cyanobacterium *Leptolyngbya boryana*: Mutations that suppress photosynthetic growth and promote dark heterotrophic growth [P4-6]

Friday 20 September

Plenary Lecture III

KFM Hall <IO>

9:00 – 9:40 [PL5] Kouki Hikosaka (Graduate School of Life Sciences, Tohoku University, Japan)

Remote sensing of photosynthetic status using photochemical reflectance index (PRI)

9:40 – 10:20 [PL6] Xin-Guang Zhu (Center of Excellence for Molecular Plant Sciences, Chinese Academy of Sciences, China)

Systems biology guided improvement of photosynthetic efficiency

Coffee Break (Cafeteria)

10:20 –

Poster Session 2

Exhibition Space 1-B and 3AB

10:40 – 12:00 Even numbers after the hyphen

Lunch (Cafeteria)

12:00 – 13:00

Symposium [S5] “Young scientist seminar”

KFM Hall <IO>

Chairs: Ginga Shimakawa (Kobe University, Japan) and Ming-Yang Ho (National Taiwan University, Taiwan)

13:00 – 13:30 [I9] Han-Wei Jiang¹, Hsiang-Yi Wu², Christopher J. Gisriel³, Chun-Hsiung Wang², Cheng-Han Yang², Jui-Tse Ko¹, Han-Chen Ho⁴, David A. Flesher⁵, Ming-Daw Tsai², Donald A. Bryant⁶, Fay-Wei Li⁷, Gary W. Brudvig^{3,5}, Meng-Chiao Ho², Ming-Yang Ho¹ (¹Department of Life Science, National Taiwan University, Taiwan; ²Institute of Biological Chemistry, Academia Sinica, Taiwan; ³Department of Chemistry, Yale University, USA; ⁴Department of Anatomy, Tzu-Chi University, Taiwan; ⁵Department of Molecular Biophysics and Biochemistry, Yale University, USA; ⁶Department of Biochemistry and Molecular Biology, The Pennsylvania State University, USA; ⁷Boyce Thompson Institute, USA)

Revealing the unique phycobilisome and photosystem I from a thylakoid free cyanobacterium, *Anthocerotibacter panamensis*

- 13:30 – 14:00** [I10] Jian Boon How, Tobias Wunder, Oliver Mueller-Cajar (School of Biological Sciences, Nanyang Technological University, Singapore)
Understanding the selective recruitment of Rubisco activase into the pyrenoid
- 14:00 – 14:15** [O5-1] Ko Imaizumi¹, Shin-ichi Arimura², Taishi Nishimura³, Ryo Nagao^{4,5}, Keisuke Saito^{6,7}, Takeshi Nakano³, Hiroshi Ishikita^{6,7}, Takumi Noguchi⁴, Kentaro Ifuku¹ (¹Graduate School of Agriculture, Kyoto University, Japan; ²Graduate School of Agricultural and Life Sciences, The University of Tokyo; ³Graduate School of Biostudies, Kyoto University; ⁴Graduate School of Science, Nagoya University; ⁵Faculty of Agriculture, Shizuoka University; ⁶Research Center for Advanced Science and Technology, The University of Tokyo; ⁷Department of Applied Chemistry, The University of Tokyo)
PsbP-D139N mutation enhances the water oxidation activity of photosystem II [P7-5]
- 14:15 – 14:30** [O5-2] Pi-Cheng Tsai, Jian-Ren Shen, Fusamichi Akita (Research Institute for Interdisciplinary Science, and Graduate School of Environmental, Life, Natural Science and Technology, Okayama University, Japan)
Cryo-EM structure of a photosystem I supercomplex from an oleaginous green alga *Coccomyxa subellipsoidea* at an atomic resolution [P9-2]
- 14:30 – 14:45** [O5-3] Viviana Pasch, Bennet Reiter, Lea Rosenhammer, Dario Leister, Thilo Rühle (Plant Molecular Biology Faculty of Biology I, Ludwig-Maximilians-Universität Munich, Germany)
AtPAF1 –a novel chloroplast ATP synthase assembly factor [P9-1]
- 14:45 – 15:00** [O5-4] Mao Suganami^{1,2}, Yoon Dong-Kyung², Ryo Maruhashi², Yuta Yahiro², Hiroyuki Ishida², Hiroshi Yamamoto³, Toshiharu Shikanai³, Yuji Suzuki⁴, Amane Makino² (¹Institute of Fermentation Sciences, Fukushima University, Japan; ²Graduate School of Agricultural Science, Tohoku University; ³Graduate School of Science, Kyoto University; ⁴Faculty of Agriculture, Iwate University)
Overproduction of Rubisco, Rubisco activase, and Flavodiiron protein improves photosynthesis without the fragility of photosystem I in rice [P8-8]

Symposium [S6] “Protein regulation and turnover”

Exhibition Space 1-A

Chairs: Keisuke Yoshida (Tokyo Institute of Technology, Japan) and Hong-Bin Wang (Guangzhou University of Chinese Medicine, China)

13:00 – 13:30 [I11] Keisuke Yoshida¹, Toru Hisabori^{1,2} (¹CLS, Tokyo Tech., Japan; ²IRFI, Tokyo Tech.)

Thioredoxin-based redox regulation network in plant chloroplasts

13:30 – 14:00 [I12] Hong-Bin Wang (School of Pharmaceutical Sciences, Guangzhou

University of Chinese Medicine, China)

The redox regulation of photosystem biosynthesis, assembly and functional maintenance

14:00 – 14:30 [I13] Yuqi Hou¹, Yuanyuan Li¹, Han Liang¹, Lu Liang¹, Owen Duncan², Harvey Millar², Lei Li¹ (¹College of Life Sciences, Nankai University, China; ²School of Molecular Science, The University of Western Australia, Australia)

The discovery of fast turnover photosynthetic proteins by stable isotope labelling and mass spectrometry

14:30 – 14:45 [O6-1] Yusuke Kato^{1,2}, Hiroshi Kuroda³, Shin-Ichiro Ozawa¹, Michael Hippler^{1,4}, Yuichiro Takahashi³, Wataru Sakamoto¹ (¹Institute of Plant Science and Resources, Okayama University, Japan; ²Faculty of Agriculture, Setsunan University, Japan; ³Research Institute for Interdisciplinary Science, Okayama University, Japan; ⁴Institute of Plant Biology and Biotechnology, University of Münster, Germany)

Characterization of tryptophan oxidation affecting D1 degradation by FtsH in Photosystem II repair [P6-1]

14:45 – 15:00 [O6-2] Yoshitaka Nishiyama, Pornpan Napaumpaiporn (Department of Biochemistry and Molecular Biology, Saitama University, Japan)

Redox regulation of the repair of photosystem II via translation factors [P6-2]

Coffee Break (Cafeteria)

15:00 – 15:30

Symposium [S7] “Mechanism of water oxidation in PSII”

KFM Hall <IO>

Chairs: Miwa Sugiura (Ehime University, Japan) and Julian Eaton-Rye (Otago University, New Zealand)

15:30 – 16:00 [I14] Guangye Han (Institute of Botany, CAS, China)

Structural insights into the assembly of photosystem II

16:00 – 16:30 [I15] Julian J. Eaton-Rye (Department of Biochemistry, University of Otago, New Zealand)

Long distance protein interactions in water splitting by photosystem II

16:30 – 17:00 [I16] J. Langley¹, J. Morton¹, R. Purchase¹, J-R. Shen², E. Krausz¹, Nick Cox¹ (¹Research School of Chemistry, Australian National University, Australia; ²Research Institute for Interdisciplinary Science, Okayama University, Japan)

Activation of the Mn₄CaO₅ cofactor of Photosystem II as studied by high field EPR and MCD spectroscopy

17:00 – 17:15 [O7-1] Shinya Kosaki¹, Yoshiki Nakajima², Jian-Ren Shen², Hiroyuki Mino¹

(¹Graduate School of Science, Nagoya University, Japan; ²Research Institute for Interdisciplinary Science, Okayama University)

Magnetic structural analysis of S₂ high-spin states manganese cluster in photosystem II by multi-frequency electron paramagnetic resonance (EPR) spectroscopy [P7-2]

17:15 – 17:30 [O7-2] [Hiroshi Isobe](#), ¹Takayoshi Suzuki, ¹Michihiro Suga, ¹Jian-Ren Shen, ²Kizahi Yamaguchi (¹Research Institute for Interdisciplinary Science, Okayama University, Japan; ²Center for Quantum Information and Quantum Biology, Osaka University)
Statistical insights into the significance of collective motion within the primary coordination sphere of the Mn₄CaO₆ Cluster in determining the catalytic progression for O₂ Evolution [P7-7]

Symposium [S8] “CO₂ fixation and crop yield improvement”

Exhibition Space 1-A

Chairs: Yuri Munekage (Kwansei Gakuin University, Japan) and Alex Wu (The University of Queensland, Australia)

15:30 – 16:00 [I17] [Alex Wu](#) (Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland, Australia)
Crop growth modelling for informing photosynthetic manipulation and crop yield improvement decisions

16:00 – 16:30 [I18] [Hiroshi Fukayama](#) (Graduate School of Agricultural Science, Kobe University, Japan)
Improving Photosynthetic CO₂ Fixation by Introducing C₄-Like Rubisco into a C₃ Plant, Rice

16:30 – 16:45 [O8-1] [Ryo Yamauchi](#)¹, Mitsunori Seo², Wataru Yamori¹ (¹Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan; ²Tropical Biosphere Research Center, University of the Ryukyus)
Unveiling the role of ABA transporter, NPF4.6: enhancing photosynthesis through stomatal control [P8-4]

16:45 – 17:00 [O8-2] [Robert Sharwood](#)¹, Grant Pearce², Maria Ermakova³, Robert T Furbank⁴, Oula Ghannoum¹ (¹Western Sydney University, Australia; ²University of Canterbury, New Zealand; ³Monash University, Australia; ⁴Australian National University, Australia)
Supercharging the carbon concentrating mechanism in C₄ plants [P8-3]

17:00 – 17:15 [O8-3] [Kazuki Taniyoshi](#)¹, Sotaro Honda², Airi Miyamoto³, Naomi Asagi³, Makoto Matsuoka⁴, Wataru Yamori⁵, Yu Tanaka⁶, Shunsuke Adachi² (¹Graduate School of Agriculture, Kyoto University, Japan; ²Graduate School of Agriculture, Tokyo University of Agriculture and Technology; ³College of Agriculture, Ibaraki University; ⁴Institute of

Fermentation Science, Fukushima University; ⁵Graduate School of Agricultural and Life Science, The University of Tokyo; ⁶Graduate School of Environmental and Life Science, Okayama University)

Genetic diversity of leaf photosynthesis under fluctuating light condition between temperate *japonica* rice cultivar [P8-12]

17:15 – 17:30 [O8-4] Kao Fujimoto, Kirana Luthfia Nayatami, Jun-Ichi Sakagami (Graduate School of Agriculture, Forestry and Fisheries, Kagoshima University, Japan)

Photosynthetic reactions during drought stress and subsequent rewatering in newly developed sugarcane cultivar “Harunoogi” [P8-9]

Gala Dinner (Hotel Plaza Kobe)

18:00 – 20:00

Saturday 21 September

Plenary Lecture IV

KFM Hall <IO>

9:00 – 9:40 [PL7] Barry Pogson (Australian National University, Australia)

Learning the languages of cells across time and space

Coffee Break (Cafeteria)

9:40 – 10:10

Symposium [S9] “Photosynthetic membrane protein complexes: structures and functions”

KFM Hall <IO>

Chairs: Genji Kurisu (Osaka University, Japan) and Mei Li (Institute of Biophysics, CAS, China)

10:10 – 10:40 [I19] Hatsuki Tanabe^{1,2}, Shinichiro Ozawa³, Akihiro Kawamoto^{1,2}, Yuichiro

Takahashi⁴, Genji Kurisu^{1,2} (¹Institute for Protein Research, Osaka University, Japan;

²Graduate School of Engineering, Osaka University; ³Institute of Plant Science and

Resources, Okayama University; ⁴Research Institute for Interdisciplinary Science,

Okayama University)

Cryo-EM structure of cytochrome *b₆f* complex from *Chlamydomonas reinhardtii*

10:40 – 11:10 [I20] Lili Shen¹, Songhao Zhao¹, Caizhe Xu¹, Yue Feng¹, Zhenhua Li¹, Tingyun

Kuang¹, Jian-Ren Shen^{1,2}, Wenda Wang^{1,2} (¹Institute of Botany, Chinese Academy of

Sciences, China; ²Graduate School of Natural Science and Technology, Okayama University,

Japan)

Structural insights into diatoms fucoxanthin chlorophyll *a/c* binding proteins and their organizations around photosystems

11:10 – 11:25 [O9-1] Soma Kawamura, Makio Yokono, Chiyo Noda, Jun Minagawa (National Institute for Basic Biology, Japan)

NPQ mechanism of the desiccation- tolerant green alga *C. ohadii* [P9-19]

11:25 – 11:40 [O9-2] Man Qi¹, Henry N. Taunt¹, Martina Bečková², Zhi Xia¹, Josef Komenda²,

Peter J. Nixon¹ (¹Department of Life Sciences, Imperial College London, UK; ²Institute of Microbiology of the Czech Academy of Sciences, Czech Republic)

Engineering photosystem II to bind chlorophyll *f* [P9-7]

11:40 – 11:55 [O9-3] Haruhiko Jimbo¹, Kensuke Takagi², Hajime Wada² (¹Graduate School of

Science and Engineering, Saitama University, Japan; ²Graduate School of Arts and Sciences,

University of Tokyo, Japan)

Cyanobacterial lipid remodeling in the response to environmental stresses [P9-22]

11:55 – 12:10 [O9-4] Chiasa Uragami¹, Marina Yoshida¹, Alastair T. Gardiner², Richard J. Cogdell³, Hideki Hashimoto¹ (¹Department of Applied Chemistry for Environment, Kwansai Gakuin University, Japan; ²Institute of Microbiology, Czech Academy of Sciences, Czech Republic; ³Institute of Molecular, Cell and Systems Biology, University of Glasgow, UK)
Carotenoid-bacteriochlorophyll *a* energy transfer mechanisms in purple photosynthetic bacteria *Rhodobacter sphaeroides* [P9-25]

Symposium [S10] “Ecophysiology”

Exhibition Space 1-A

Chairs: Ko Noguchi (Tokyo University of Pharmacy and Life Sciences, Japan) and Dongliang Xiong (Huazhong Agricultural University, China)

10:10 – 10:40 [I21] Dongliang Xiong, Qiaoyun Zhang, Linna Zheng (College of Plant Science and Technology, Huazhong Agricultural University, China)

Choke points along mesophyll CO₂ diffusion pathway

10:40 – 11:10 [I22] Andrew P. Scafaro^{1,2}, Brad C. Posch³, John R. Evans¹, Graham D.

Farquhar¹, Owen K. Atkin^{1,2} (¹Research School of Biology, The Australian National University, Australia; ²Centre for Entrepreneurial Agri-Technology, Australian National University, Australia; ³Department of Research, Collections and Conservation, Desert Botanical Garden, USA)

Predicting the response of higher plant photosynthesis to rising temperature

11:10 – 11:25 [O10-1] Yuqi Zhang¹, Elias Kaiser², Satadal Dutta³, Thomas D. Sharkey⁴, Leo F.M. Marcelis², Tao Li¹ (¹Institute of Environment and Sustainable Development in Agriculture, Chinese Academy of Agriculture Sciences, China; ²Department of Plant Sciences, Wageningen University, the Netherlands; ³Faculty of 3ME, TU Delft, the Netherlands; ⁴Plant Resilience Institute, and Department of Biochemistry and Molecular Biology, Michigan State University, USA)

Short-term salt stress reduces photosynthetic oscillations under triose phosphate utilization limitation in tomato [P10-6]

11:25 – 11:40 [O10-2] Yuta Kato¹, Kaori Kohzuma¹, Takao Oi², Yoshikatsu Sato³, Mitsutaka Taniguchi⁴, Kentaro Ifuku¹ (¹Graduate School of agricultural Sciences, Kyoto University, Japan; ²School of Science and Engineering, Kochi University of Technology; ³Institute of Transformative Bio-Molecules, Nagoya University; ⁴Graduate School of Bioagricultural Sciences, Nagoya University)

Investigation of C₄ photosynthesis by live leaf-section imaging [P10-8]

11:40 – 11:55 [O10-3] Baptiste Genot, Shinichiro Maruyama (Graduate School of Frontier Sciences, The University of Tokyo, Japan)

Deciphering roles of ethylene on photosynthesis regulation in non-model algae [P10-9]

11:55 – 12:10 [O10-4] Riichi Oguchi¹, Barry Osmond^{2,3}, Wah Soon Chow³ (¹Osaka Metropolitan University, Japan; ²School of Earth, Atmospheric and Life Sciences, University of Wollongong, Australia; ³The Australian National University, Australia)
Intraspecific variation in temperature response of the quantum yield of PSI and PSII among *Arabidopsis thaliana* ecotypes [P10-11]

Lunch (Cafeteria)

12:10 – 13:30

Symposium [S11] “Chloroplast metabolism and biogenesis”

KFM Hall <IO>

Chairs: Shinji Masuda (Tokyo Institute of Technology/Institute of Science Tokyo, Japan) and
Congming Lu (Shandong Agricultural University, China)

13:30 – 14:00 [I23] Aihong Zhang, Lin Tian, Tong Zhu, Mengwei Sun, Mengyu Li, Ying Fang,
Congming Lu (College of Life Sciences, Shandong Agricultural University, China)

Deciphering the photosystem I assembly pathway in land plants

14:00 – 14:30 [I24] Akiko Yoshihara¹, Manato Kawamukai², Risa Uwatoko³, Keiko Kobayashi³, Noriko Nagata³, Koichi Kobayashi¹ (¹Graduate School of Science, Osaka Metropolitan University, Japan; ²School of Science, Osaka Prefecture University; ³Faculty of Science, Japan Women’s University)

Essential roles of phosphatidylglycerol in chloroplast biogenesis

14:30 – 15:00 [I25] Lixin Zhang¹, Min Ouyang², Xiumei Xu¹, Dandan Lu¹ (¹School of Life Sciences, Henan University, China; ²Hubei Hongshan Laboratory, Huazhong Agricultural University)

Protein sorting and protein complex assembly within chloroplasts

15:00 – 15:15 [O11-1] Takanari Nemoto¹, Kazuma Sakoda², Atsushi Sakurai², Sousuke Imamura², Shinji Masuda¹ (¹Department of Life Science and Technology, Tokyo Institute of Technology, Japan; ²Space Environment and Energy Laboratories, Nippon Telegraph and Telephone Corporation)

Regulation of nuclear gene expression by the plastidial signaling molecule, ppGpp, in response to nitrogen availability [P11-3]

15:15 – 15:30 [O11-2] Gen Takenaka¹, Kotaro Ogasa¹, Maya Tatsumi², Daichi Suwa², Satomi Takeda¹ (¹Graduate School of Science, Osaka Metropolitan University, Japan; ²College of Life, Environment, and Advanced Sciences, Osaka Prefecture University)

Characteristics of the photosynthetic function of photoautotrophically cultured green cells

of *Arabidopsis* [P11-7]

Symposium [S12] “Biofuels and artificial photosynthesis”

Exhibition Space 1-A

Chairs: Hitoshi Tamiaki (Ritsumeikan University, Japan) and Chunxi Zhang (Institute of Chemistry, CAS, China)

13:30 – 14:00 [I26] Chunxi Zhang^{*}, Changhui Chen (Institute of Chemistry, CAS, China)

Structural and functional mimicking of photosynthetic oxygen-evolving center

14:00 – 14:30 [I27] Takehisa Dewa (Graduate School of Engineering, Nagoya Institute of Technology, Japan)

Biohybrid Light-Harvesting Complexes: Ultrafast excitation energy transfer and functional coupling with reaction center complexes

14:30 – 15:00 [I28] Yoshitaka Saga (Faculty of Science and Engineering, Kindai University, Japan)

Control of photofunctions of photosynthetic light-harvesting proteins by pigment modification

15:00 – 15:15 [O12-1] Koki Takagi¹, Yuka Kusunoki¹, Daisuke Takagi², Sophie A. Meredith³, Ashley M. Hancock³, Stephen D. Evans³, Peter G. Adams³, Kenichi Morigaki^{1,4} (¹Graduate School of Agricultural Science, Kobe University, Japan; ²Faculty of Agriculture, Setsunan University, Japan, ³School of Physics and Astronomy, University of Leeds, UK; ⁴Biosignal Research Center, Kobe University, Japan)

Reconstitution of thylakoid membrane in a patterned polymeric lipid bilayer scaffold [P12-9]

15:15 – 15:30 [O12-2] Saki Kichishima, Hitoshi Tamiaki (Graduate School of Life Sciences, Ritsumeikan University, Japan)

Synthesis of pheophytin–quinone conjugates and their physical properties in solution [P12-3]

Coffee Break (Cafeteria)

15:30 – 16:00

Plenary Lecture V and Closing Ceremony

KFM Hall <IO>

16:00 – 16:40 [PL8] Takumi Noguchi (Graduate School of Science, Nagoya University, Japan)

Photosynthetic oxygen-evolving complex: Origin, formation, and reaction mechanism

16:40 – 17:00 Award and closing ceremony

POSTER PRESENTATIONS

[S1] Light harvesting and photosynthetic electron transfer

[P1-1] Xiaobo Li, Tianjun Cao, Huan Zhang, Yanyou Jiang (School of Life Sciences, Westlake University, China)

Biosynthesis of light-harvesting pigments in aquatic photosynthesis

[P1-2] Yuki Okegawa¹, Ken Motohashi², Wataru Sakamoto¹ (¹Institute of Plant Science and Resources, Okayama University, Japan; ²Faculty of Life Sciences, Kyoto Sangyo University) Photoprotective mechanism of Photosystem I by the thioredoxin system under fluctuating light conditions

[P1-3] Masaya Kimura¹, Naohiro Shimamoto¹, Kazumi Koyama², Makoto Nakamura², Miwa Sugiura^{1,2} (¹Graduate School of Science and Engineering, ²Proteo-Science Research Center, Ehime University, Japan)

Effects of different the axial ligands of accessory chlorophylls on photoinhibition in Photosystem II

[P1-4] Ko Takeuchi¹, Shintaro Harimoto¹, Yufen Che², Shu Maekawa³, Chikahiro Miyake³, Kentaro Ifuku¹ (¹Graduate School of Agriculture, Kyoto University, Japan; ²Graduate School of Bioscience, Kyoto University; ³Graduate School of Agriculture, Kobe University) Mechanisms causing varietal differences of photosystem I inhibition in cucumber under low-temperature stress

[P1-5] Akito Machida¹, Akane Echigo¹, Kumiko Kondo², Toru Hisabori^{1,2,3,4}, Shinji Masuda¹ (¹Dept. Life Sci. & Tech., Tokyo Inst. Tech., Japan; ²CLS, IIR, Tokyo Inst. Tech.; ³Res. Inst. Integr. Sci., Kanagawa Univ.; ⁴SOKENDAI)

Light-responsive proton transport mechanisms of cyanobacterial cell membranes control intracellular pH

[P1-6] Sam Wilson¹, Eunchul Kim¹, Jun Minagawa^{1,2} (¹Division of Environmental Photobiology, National Institute for Basic Biology, Japan; ²School of Life Science, SOKENDAI)

An altered light-harvesting complex II in *Chlamydomonas priscuii* allows for efficient light harvesting under an Antarctic lake

[P1-7] Mai Watanabe¹, Keita Miyake², Hideo Dohra³, Masahiko Ikeuchi¹, Rei Narikawa¹ (¹Graduate School of Science, Tokyo Metropolitan University, Japan; ²Graduate School of Arts and Sciences, The University of Tokyo; ³Research Institute of Green Science and Technology, Shizuoka University)

- Acaryochloris marina* NIES 2412 absorbs and utilizes light of wavelength longer than 730 nm
- [P1-8] Kosuke Tada¹, Kaho Yamagata¹, Kazumi Koyama², Miwa Sugiura^{1,2} (¹Graduate School of Science and Engineering, Japan; ²Proteo-Science Research Center, Ehime University)
Functional and structural stabilization mechanisms of Q_B-neighbouring amino acids in photosystem II
- [P1-9] Yuki Kato, Honami Ito, Takumi Noguchi (Graduate School of Science, Nagoya University, Japan)
Electron and proton transfer reactions at the secondary quinone electron acceptor Q_B in photosystem II monitored by time-resolved infrared spectroscopy
- [P1-10] Andrei Herdean¹, Donna Sutherland², Christopher Hall³, David Hughes⁴, Unnikrishnan Kuzhiumparambil¹, Bernardo Campos Diocaretz¹, Peter Ralph¹ (¹University of Technology Sydney, Australia; ²Algal Solutions, Christchurch, New Zealand; ³Neara, Australia; ⁴The Australian Institute of Marine Science, Australia)
Assessing temperature and light interactions on non-photochemical quenching in microalgae
- [P1-11] Constantinos Varotsis¹, Panagiotis Loukakos², Charalambos Andreou¹ (¹Department of Chemical Engineering, Cyprus University of Technology, Cyprus; ²Institute of Electronic Structure and Laser (IESL) Foundation for Research and Technology-Hellas, Greece)
Transient absorption spectroscopy of the fucoxanthin-chlorophyll *a/c* (FCPs) proteins of the marine diatoms *Fragilariopsis* sp and *P. tricornutum*
- [P1-12] Tatsuhisa Konishi, Ko Noguchi (School of Life Sciences, Tokyo University of Pharmacy and Life Sciences, Japan)
Effect of inhibition of the respiratory chain on the photosynthetic electron transport depends on photorespiratory activity
- [P1-13] Sae Bekki¹, Ai Ohnishi², Hajime Wada², Koichi Kobayashi¹ (¹Graduate School of Science, Osaka Metropolitan University Japan; ²Graduate School of Arts and Sciences, The University of Tokyo)
Photosynthetic protection mechanisms against CO₂ limitation in submerged *Arabidopsis thaliana* seedlings
- [P1-14] Eunchul Kim, Jun Minagawa (Division of Environmental Photobiology, National Institute for Basic Biology, Japan)
Regulatory factors and formation of photosystem megacomplexes [O1-1]
- [P1-15] Russell Woodford^{1,3}, Jacinta Watkins², Marten Moore³, Robert T. Furbank³, Maria Ermakova¹ (¹Monash University, Australia; ²Queensland University of Technology; ³Australian National University)
PGR5 enables photoprotection of C₄ photosynthesis under high and fluctuating light environments

- [P1-16] Jian Xing¹, Minoru Kumazawa¹, Seiji Akimoto², Shoko Tsuji¹, Noriko Ishikawa¹, Kentaro Ifuku¹ (¹Graduate School of Agriculture, Kyoto Univ., Japan; ²Graduate School of Science, Kobe Univ.)
Configuration of antenna assembly, electron transport, and excitation energy transfer within different FCPI-deficient strains of diatom *Chaetoceros gracilis*
- [P1-17] Yuma N Yamamoto¹, Atsushi Takabayashi², Takehiro Suzuki³, Naoshi Dohmae³, Ryo Nagao¹ (¹Faculty of Agriculture, Shizuoka University, Japan; ²Institute of Low Temperature Science, Hokkaido University; ³Biomolecular Characterization Unit, RIKEN Center for Sustainable Resource Science)
Isolation and characterization of photosynthetic pigment protein complexes from a prasinophyte *Tetraselmis striata*
- [P1-18] Ryouhei Kobayashi, Toshiharu Shikanai (Grad. Sch. Sci., Kyoto Univ., Japan)
Exploring the molecular evolution of photosynthetic control
- [P1-19] Ichiro Terashima¹, Riichi Oguchi², Kimie Atsuzawa³, Yasuko Kaneko⁴, Masaru Kono⁵ (¹Institute of Sustainable Agro-Ecosystem Services, The University of Tokyo, Japan; ²Botanical Gardens, Osaka Metropolitan University; ³Comprehensive Analysis Center for Science, Saitama University; ⁴Faculty of Education, Saitama University; ⁵Astrobiology Center, National Institutes of Natural Sciences)
Estimation of spillover from PSII to PSI in leaf discs at 77K
- [P1-20] Masaru Kono¹, Wataru Yamori², Ichiro Terashima² (¹Astrobiology Center, NINS, Japan; ²Graduate School of Agricultural and Life Sciences, The University of Tokyo)
Thylakoid K⁺/H⁺ antiporter KEA3 is involved in acceleration of NPQ relaxation by far-red light upon transition from high- to low-light
- [P1-21] Chihiro Azai¹, Masahiko Higashiguchi², Kazuki Terauchi² (¹Faculty of Science and Engineering, Chuo University, Japan; ²Graduate School of Life Sciences, Ritsumeikan University)
Empirical evidence for photoinhibition of anaerobic photosynthesis in green sulfur bacterium *Chlorobaculum tepidum*
- [P1-22] Ruohan Tao¹, Ikuya Kishida¹, Chiasa Uragami¹, R.J. Cogdell², Hideki Hashimoto^{1*} (¹Graduate School of Science and Technology, Kwansei Gakuin University, Japan; ²College of Medical, Veterinary and Life Science, University of Glasgow, UK)
Evaluation of photoprotective function in light-harvesting systems containing bacteriochlorophyll *b* in *Blastochloris viridis*
- [P1-23] Minami Murai¹, Ayaka Kimura¹, Ko Imaizumi¹, Keisuke Yoshida², Kenta Miura¹, Ko Takeuchi¹, Yufen Che³, Noriko Ishikawa¹, Toru Hisabori^{2,4}, Kaori Kohzuma¹, Kentaro Ifuku² (¹Grad. Sch. Agric., Kyoto Univ., Japan; ²CLS, Tokyo Tech.; ³Grad. Sch. Biostudies., Kyoto

Univ.; ⁴IRFI, Tokyo Tech.)

Deregulation of the chloroplast NDH complex activity causes malfunction of photosystem II in *Arabidopsis pifi* mutants [O1-2]

[P1-24] Riku Nagata¹, Seonjon Kim¹, Chiasa Uragami¹, Ruohan Tao¹, Yasuhiro Nishida², Masaki Honda³, Hideki Hashimoto¹ (¹Graduate School of Science and Technology, Kwansei Gakuin University, Japan; ²Fuji Chemical Industries Co., Ltd.; ³Graduate School of Environmental and Human Sciences, Meijo University)

In-line HPLC-raman spectroscopy of astaxanthin isomers

[P1-25] Masato Kubota^{1,2}, Eunchul Kim^{1,2}, Asako Ishii¹, Jun Minagawa^{1,2} (¹Division of Environmental Photobiology, National Institute for Basic Biology, Japan; ²The Graduate University for Advanced Studies, SOKENDAI)

The green light-dependent state transition in the marine phytoplankton *Ostreococcus tauri*

[P1-26] Zihao Ye¹, Mina Sawada¹, Makiko Iwasa¹, Ryo Moriyama¹, Debayan Dey¹, Miyu Furutani², Mitsutoshi Kitao³, Toshihiko Hara¹, Ayumi Tanaka¹, Junko Kishimoto¹, Makio Yokono⁴, Seiji Akimoto², Atsushi Takabayashi¹, Ryouichi Tanaka¹ (¹Institute of Low Temperature Science, Hokkaido University, Japan; ²Graduate School of Science, Kobe University; ³Hokkaido Research Center, Forestry and Forest Products Research Institute; ⁴Division of Environmental Photobiology, National Institute for Basic Biology and School of Life Science, SOKENDAI)

Revisiting the early light-induced protein hypothesis in the sustained thermal dissipation mechanism in yew leaves

[P1-27] Chieko Onami¹, Ryutaro Tokutsu², Keishiro Sano³, Tohru Tsuchiya¹, Ryoma Kamikawa³, Takashi Yoshida³, Hideaki Miyashita¹ (¹Graduate School of Human and Environmental Studies, Kyoto University, Japan; ²Graduate School of Science, Kyoto University; ³Graduate School of Agriculture, Kyoto University)

Novel far-red light-harvesting antenna complexes of *Phaeophila dendroides* (Ulvales, Ulvophyceae) for acclimation to severe light conditions within coral skeletons

[P1-28] Asuka Nakamura¹, Takako Ogawa², Ginga Shimakawa³, Yuri N. Munekage¹ (¹Graduate School of Science and Technology, Kwansei Gakuin University, Japan; ²Graduate School of Science and Engineering, Saitama University; ³Graduate School for Agricultural Science, Kobe University)

Cyclic electron flow involves in chloroplast energy production and PSI photoprotection in the C₄ species *Flaveria bidentis*

[P1-29] Midori Nakamura¹, Minoru Kumazawa¹, Ryo Nagao², Shoko Tsuji¹, Takehiro Suzuki³, Noriko Ishikawa¹, Naoshi Dohmae³, Seji Akimoto⁴, Kentaro Ifuku¹ (¹Graduate School of Agriculture, Kyoto University, Japan; ²Faculty of Agriculture, Shizuoka University;

³Biomolecular Characterization Unit, RIKEN Center for Sustainable Resource Science;
⁴Graduate School of Science, Kobe University)

Characterization of FCP responding to light and CO₂ conditions in marinediatom *Chaetoceros gracilis*

[P1-30] Ai Ishizaki¹, Sayaka Koshi¹, Ryoichi Tanaka², Atsushi Takabayashi², Takao Oi³, Kentaro Ifuku⁴, Yuri N. Munekage¹ (¹School of Science and Technology, Kwansai Gakuin University, Japan; ²Institute of Low Temperature Science, Hokkaido University; ³School of Engineering Science, Kochi University of Technology; ⁴Graduate School of Agriculture, Kyoto University)
NPQ7 was involved in stability of photosystem II and thylakoid membrane maintenance in *C₄ Flaveria bidentis*

[P1-31] Canceled

[P1-32] Takako Ogawa¹, Jun Minagawa², Yukako Hihara¹ (¹Graduate School of Science and Engineering, Saitama University, Japan; ²Division of Environmental Photobiology, National Institute for Basic Biology)

Metatranscriptome analysis revealed photosynthetic dynamics in cyanobacteria under natural environments

[P1-33] Mengyuan Zheng^{1,2,3‡}, Xiaojie Pang^{1,2,3‡}, Ming Chen^{1,2}, Lijin Tian^{1,2,3*} (¹Institute of Botany, Chinese Academy of Sciences, China; ²China National Botanical Garden; ³University of Chinese Academy of Sciences)

Ultrafast energy quenching mechanism of LHCSR3-dependent photoprotection in *Chlamydomonas* [O1-3]

[P1-34] Tomomi Inagaki¹, Yukie Kojima², Kazuki Terauchi¹, Chihiro Azai² (¹Graduate School of Life Sciences, Ritsumeikan University, Japan; ²Graduate School of Science and Engineering, Chuo University)

Preparation of reaction center complex lacking iron-sulfur cluster F_X in the green sulfur bacterium *Chlorobaculum tepidum*

[P1-35] Tsukasa Fukunaga¹, Takako Ogawa^{1,2}, Kintake Sonoike¹ (¹Waseda University, Japan; ²Saitama University)

Redox-type USP protein: a novel regulator of photosynthesis

[P1-36] Laura Mosebach¹, Shin-Ichiro Ozawa², Muhammad Younas¹, Huidan Xue¹, Martin Scholz¹, Yuichiro Takahashi³, Michael Hippler^{1,2} (¹Institute of Plant Biology and Biotechnology, University of Münster, Germany; ²Institute of Plant Science and Resources, Okayama University, Japan; ³Research Institute for Interdisciplinary Science, Okayama University, Japan)

Chemical protein crosslinking-coupled mass spectrometry reveals interaction of LHCI with LHCII and LHCSR3 in *Chlamydomonas reinhardtii*

[P1-37] Soichiro Seki^{1,2}, Naoko Norioka², Hideaki Tanaka², Tomoko Miyata^{3,4}, Keiichi Namba^{3,4}, Genji Kurisu^{2,4,5}, Ritsuko Fujii^{1,6,7} (¹Graduate School of Science, Osaka City University, Japan; ²Institute for Protein Research, Osaka University; ³Graduate School of Frontier Biosciences, Osaka University; ⁴JEOL YOKOGUSHI Research Alliance Laboratories, Osaka University; ⁵Institute for Open and Transdisciplinary Research Initiatives, Osaka University; ⁶Graduate School of Science, and ⁷Research Center for Artificial Photosynthesis, Osaka Metropolitan University)

Structural validation of recombinant LHCII using cryo-EM

[P1-38] Hayata Sakai¹, Koki Takagi², Kenichi Morigaki³ Shen Ye¹, Yutaka Shibata¹ (¹Chemistry, Graduate School of Tohoku University, Japan; ²Graduate School of Agricultural Science, Kobe University; ³Biosignal Research Center, Kobe University)

Formation of mega-complexes in supported hybrid thylakoid membrane suggested by the analysis of light harvesting kinetics at 80 K

[P1-39] Shun Arai^{1,2,3}, Tomomi Inagaki⁴, Jiro Harada⁵, Chihiro Azai⁶, Toru Kondo^{2,3} (¹Dept. of Life & Sci., Tokyo tech., Japan; ²Div. of photophysical biology, NIBB; ³Interconnective photobiology group, ExCELLS; ⁴Grad. Sch. Life Sci., Ritsumeikan Univ.; ⁵Sch. of Med., Kurume Univ.; ⁶Fac. of Sci. & Eng., Chuo Univ.)

Single-particle transient absorption spectroscopy reveals light-harvesting control via structural heterogeneity in photosynthetic antenna, chlorosome

[P1-40] Okviyoandra Akhyar¹, Soichiro Seki^{2,5}, Kazuhiro Yoshida³, Chiyo Takagi⁴, Yasuhiro Kamei⁴, Ritsuko Fujii^{1,2,3} (¹Research Center for Artificial Photosynthesis (ReCAP), Osaka Metropolitan University, Japan; ²Graduate School of Science, Osaka City University; ³Graduate School of Science, Osaka Metropolitan University; ⁴Optics and Imaging Facility Trans-Scale Biology Center, National Institute for Basic Biology; ⁵Institute for Protein Research, Osaka University)

Light-induced growth dynamics of yellow marine *Chlamydomonas*

[P1-41] Zhuoya Wang¹, Guy T. Hanke², Genji Kurisu¹ (¹Institute for Protein Research, Osaka University, Japan; ²School of Biological and Behavioural Sciences, Queen Mary University of London, UK)

Structural analysis of the complex between Ferredoxin-NADP(+) reductase and TROL peptide

[P1-42] Olga Baidukova¹, Yousef Yari Kamrani¹, Aida Salmani², Peter Hegemann¹ (¹Institute of Biology, Humboldt University of Berlin, Germany; ²Institute of Plant and Environmental Sciences, Slovak University of Agriculture, Slovakia)

Channelrhodopsin-1 is involved in regulation of photoprotection in *Chlamydomonas reinhardtii*

[P1-43] Soichiro Seki¹, Koichi Kobayashi², Ritsuko Fujii^{1,3} (¹Graduate School of Science, Osaka

City University, Japan; ²Graduate School of Science, Osaka Metropolitan University; ³Research Center for Artificial Photosynthesis, Osaka Metropolitan University)
Photosynthetic capacity and pigment distribution of a siphonous green alga, *Dichotomosiphon tuberosus*

[P1-44] S. James Nix¹, Robert Furbank¹, Kai Chan¹, Marten Moore¹, Maria Ermakova²
(¹Australian National University, Australia; ²Monash University)

Elucidating and engineering cell-specific cyclic electron flow of C₄ photosynthesis

[P1-45] Canceled

[P1-46] Toru Nakata, Mari Nakagawa, Mutsumi Kubushiro, Shigeru Kawai, Toshihiko Eki, Yuu Hirose (Department of Applied Chemistry and Life Science, Toyohashi Tech., Japan)
Characterization of diverse chromatic acclimation in cyanobacteria [O1-4]

[P1-47] Yu-meng Wang, Xin-Guang Zhu* (Center for Excellence in Molecular Plant Sciences, Chinese Academy of Sciences, China)

Cyclic electron transfer transcription factors based on regulatory network in *Arabidopsis thaliana*

[S2] Evolution of photosynthesis

[P2-1] Yen-I Cheng^{1,2,3}, Yu-Chen Lin¹, Lin Chou¹, Yi-Fang Chiu¹, Hsin-Ta Hsueh⁴, Jyh-Yih Leu⁵, Long-Chi Wang³, Chih-Horng Kuo¹, Hsiu-An Chu¹ (¹Institute of Plant and Microbial Biology, Academia Sinica, Taiwan; ²Department of Life Science, National Chung-Hsing University; ³Doctoral Program in Microbial Genomics, National Chung Hsing University and Academia Sinica; ⁴Sustainable Environment Research Laboratories, National Cheng Kung University; ⁵Department of Life Science, Fu Jen Catholic University)

Comparative genomic analysis reveals distinctive genomic features of Taiwan hot-spring cyanobacteria

[P2-2] Arisa Nishihara¹, Yusuke Tsukatani², Chihiro Azai³, Masaru K. Nobu⁴ (¹Department of Life Science and Biotechnology, The National Institute of Advanced Industrial Science and Technology (AIST), Japan; ²Biogeochemistry Research Center, JAMSTEC; ³Faculty of Science and Engineering, Chuo University; ⁴Institute for Extra-Cutting-Edge Science and Technology Avant-Garde Research (X-star), Japan Agency for Marine-Earth Science and Technology (JAMSTEC)) [O2-1]

Illuminating the co-evolution of photosynthesis and bacteria

[P2-3] Yuzuki Akutagawa¹, Shuhei Watanabe¹, Haruki Fujiwara¹, Akihiro Nagata¹, Yuki Kudoh¹, Shin-ichi Hachisuka², Hiroshi Kikukawa², Hiroki Ashida³, Ken'ichiro Matsumoto² (¹Graduate School of Chemical Sciences and Engineering, Hokkaido University, Japan; ²Faculty of

Engineering, Hokkaido University; ³Graduated School of Human Development and Environment, Kobe University)

Screening of highly active mutants of RuBisCO using polyhydroxyalkanoate synthesis system

[P2-4] Shinsa Kameo^{1,2}, Renon Matsumae², Ryouichi Tanaka^{1,2}, Atsushi Takabayashi^{1,2} (¹Grad. Sch. of Env. Sci, Hokkaido Univ., Japan; ²ILTS, Hokkaido Univ.)

The early branched streptophyte *Mesostigma viride*, shows zeaxanthin-dependent quenching ability [O2-4]

[P2-5] Minoru Kumazawa, Kentaro Ifuku (Graduate School of Agriculture, Kyoto University, Japan)

Novel insights into red-lineage LHCI evolution from protein complex structures and molecular phylogeny [O2-3]

[P2-6] Shigeru Kawai, Risa Tamagawa, Tatsuki Machida, Toshihiko Eki, Yuu Hirose (Department of Applied Chemistry and Life Science, Toyohashi University of Technology, Japan) Comprehensive phylogenetic analysis reveals novel phycobiliprotein lineages in cyanobacteria [O2-2]

[P2-7] Shigeru Itoh¹, Hirotaka Kitoh-Nishioka², Ayumu Takagi², Akihiro Kimura¹ (¹Department of Physics, Nagoya Univ., Japan; ²Faculty of Science and Engineering, Kindai University) Comparison of PSI and bacterial type-I RCs by theoretical studies of exciton states and quinone docking simulations

[P2-8] Jianzhao Yang^{1,3}, Caiyao Zhao², Anting Ni², Hanyang Chen², Hong Su^{1,3}, Yating Cheng^{1,3}, Xun Xu², Xin-Guang Zhu^{1*} (¹Center for Excellence in Molecular Plant Sciences (CEMPS) / Shanghai Institute of Plant Physiology and Ecology (SIPPE), Chinese Academy of Sciences, China; ²BGI Research; ³University of Chinese Academy of Sciences (UCAS))

Comparative spatial single cell transcriptomes revealed molecular mechanisms regulating morphogenesis of Kranz anatomy in C4 grasses

[S3] Structures and functions of bacterial photocomplexes

[P3-1] Xin Zhang¹, Jiyu Xin¹, Lu Yu^{2,4}, Jingyi Wu¹, Zhenzhen Min¹, Yueyong Xin³, Huimin He³, Aokun Liu², Jian Kuang⁴, Menghua Liu¹, Changlin Tian^{2,4}, Xiaoling Xu^{1,3} (¹School of Basic Medical Sciences, Hangzhou Normal University, China; ²Chinese Academy of Sciences; ³College of Life and Environmental Sciences, Hangzhou Normal University; ⁴Center for Bioanalytical Chemistry, Hefei National Laboratory of Physical Science at Microscale, University of Science and Technology of China)

Characterizing the photosynthetic electron transport chain of anoxygenic photosynthetic bacterium *Roseiflexus castenholzii* [O3-1]

- [P3-2] Risa Kojima¹, Kevin E. Redding², Daisuke Kosumi³, Hirozo Oh-oka⁴ (¹College of Life Science, Ritsumeikan University, Japan; ²School of Molecular Sciences, Arizona State University, USA; ³Institute of Industrial Nanomaterials, Kumamoto University, Japan; ⁴Center for Education in Liberal Arts and Sciences, Osaka University, Japan)
Comparisons of excitation energy transfer dynamics between the wild-type and $\Delta pshX$ reaction center complexes from *Heliomicrobium modesticaldum* [O3-2]
- [P3-3] Shota Kawato¹, Kazuki Inada², Chiasa Uragami³, Shinichi Sato¹, Yukihiro Kimura², Hirotaka Kitoh-Nishioka¹, Hideki Hashimoto³, Yoshitaka Saga¹ (¹Faculty of Science and Engineering, Kindai University, Japan; ²Faculty of Agricultural Science, Kobe University; ³Faculty of Science and Technology, Kwansei Gakuin University)
Effects of B800 bacteriochlorophyll *a* in light-harvesting complex 2 on the protein structure and functions
- [P3-4] Jiro Harada¹, Hirozo Oh-oka², Ken Yamamoto¹, Hitoshi Tamiaki³ (¹Department of Medical Biochemistry, Kurume University School of Medicine, Japan; ²Graduate School of Science, Osaka University; ³Graduate School of Life Sciences, Ritsumeikan University)
C20-methyl group of bacteriochlorophylls *c* and *e* catalyzed by the methyltransferase BchU, working in their synthetic pathways [O3-3]
- [P3-5] Yi-Hao Yan^{1,2}, Guang-Lei Wang^{1,2}, Zheng-Yu Wang-Otomo³, Long-Jiang Yu^{1,2*} (¹Institute of Botany, Chinese Academy of Sciences, China; ²University of Chinese Academy of Sciences, China; ³Department of Microbiology, Southern Illinois University, USA; ⁴Faculty of Science, Ibaraki University, Japan)
Molecular structure and characterization of the *Thermochromatium tepidum* light-harvesting 1 photocomplex produced in a foreign host [O3-4]
- [P3-6] Ibu Yasunaga, Tomoaki Deguchi, Masayuki Kobayashi (National Institute of Technology, Ariake College, Japan)
Antioxidation properties of purple nonsulfur bacterium, *Rhodospirillum rubrum* and its extracts
- [P3-7] Yukihiro Kimura¹, Ryo Kanno², Kaisei Mori¹, Ryuta Seto¹, Yoshiki Matsuda¹, Shinji Takenaka¹, Hiroyuki Mino³, Malgorzata Hall⁴, Endang R. Purba⁴, Akira Mizoguchi⁵, Bruno M. Humbel⁶, Michael T. Madigan⁷, Zheng-Yu Wang-Otomo⁸, Kazutoshi Tani⁹ (¹Graduate School of Agriculture, Kobe University, Japan; ²Quatum Wave Microscopy Unit, OIST, Japan; ³Graduate School of Science, Nagoya University, Japan; ⁴Scientific Imaging Section, Research Support Division, OIST, Japan; ⁵Graduate School of Medicine, Mie University, Japan; ⁶Provost Office, OIST, Japan; ⁷Program in Microbiology, Southern Illinois University, USA; ⁸Faculty of Science, Ibaraki University, Japan; ⁹Center for Computational Sciences, University of Tsukuba, Japan)

The LH1–RC structure of a thermophilic purple nonsulfur bacterium powers photosynthesis with extremely low-energy near-infrared light

[P3-8] Akane Minamino¹, Mohit. K. Saini², Endang R. Purba³, Malgorzata Hall³, Shinji Takenaka¹, Vera Thiel⁴, Bruno M. Humbel⁵, Michael T. Madigan⁶, Zheng-Yu Wang-Otomo⁷, Kazutoshi Tani⁸, Yukihiro Kimura¹ (¹Graduate School of Agriculture, Kobe University, Japan; ²Institute of Microbiology, Centre Algatech, Czech Republic; ³Scientific Imaging Section, Research Support Division, OIST, Japan; ⁴Leibniz Institute, DSMZ-German Collection of Microorganisms and Cell Cultures, Germany; ⁵Provost Office, OIST, Japan; ⁶Program in Microbiology, Southern Illinois University, USA, ⁷Faculty of Science, Ibaraki University, Japan; ⁸Center for Computational Sciences, University of Tsukuba, Japan)

The most stable LH1-RC structure from a novel thermophilic purple sulfur bacterium, *Caldichromatium japonicum*

[P3-9] Kazuki Inada¹, Seiji Akimoto², Shinji Takenaka¹, Michael T. Madigan³, Zheng-Yu Wang-Otomo⁴, Yukihiro Kimura¹ (¹Graduate School of Agriculture, Kobe University, Japan; ²Graduate School of Science, Kobe University, Japan; ³Program in Microbiology, Southern Illinois University, USA; ⁴Faculty of Science, Ibaraki University, Japan)

Characterization of the light-harvesting 1 reaction center complexes from psychrophilic purple nonsulfur bacteria

[P3-10] Zhang Zhaoxu², Noko Norioka¹, Hideaki Tanala^{1,2}, Genji Kurisu^{1,2} (¹Institute for Protein Research; ²Graduate School of Engineering, Osaka University, Japan)

Structural analysis of allophycocyanin from *Cyanidioschyzon merolae*

[S4] Photosynthetic gene expression

[P4-1] Ryo Tachibana¹, Susumu Abe^{2,3}, Momo Marugami^{2,3}, Ayumi Yamagami¹, Rino Akema¹, Takao Ohashi¹, Kaisei Nishida¹, Shohei Nosaki⁴, Takuya Miyakawa¹, Masaru Tanokura⁵, Jong-Myong Kim^{3,5,6}, Motoaki Seki³, Takehito Inaba⁷, Minami Matsui³, Kentaro Ifuku⁸, Tetsuo Kushiro², Tadao Asami⁵, Takeshi Nakano¹ (¹Graduate School of Biostudies, Kyoto University Japan; ²School of Agriculture, Meiji University; ³RIKEN, CSRS; ⁴Faculty of Life and Environmental Sciences, Tsukuba University; ⁵Graduate School of Agricultural and Life Sciences, University of Tokyo; ⁶Ac-Planta Inc.; ⁷Faculty of Agriculture, University of Miyazaki; ⁸Graduate School of Agriculture, Kyoto University)

BPG4 suppresses GLK transcription factors to maintain chloroplast homeostasis downstream light and brassinosteroid signaling

[P4-2] Shan Qi^{1,2}, Chaojun Cui¹, Jieya Xia^{1,2}, Mengping Li¹, Chanhong Kim^{1,2} (¹CEMPS, Chinese Academy of Sciences, China; ²University of the Chinese Academy of Sciences)

Coordinated expression of photosynthesis-related genes: A crucial nexus for chloroplast biogenesis and adaptive plant stress responses

- [P4-3] Xiao-Xian Wu¹, Wen-Hui Mu^{1,2}, Fan Li³, Shu-Yi Sun⁴, Chao-Jun Cui^{1,4,5}, Chanhong Kim⁵, Fei Zhou³, Yu Zhang¹ (¹Shanghai Institute of Plant Physiology and Ecology, Chinese Academy of Sciences; China; ²School of Life Sciences, Henan University; ³National Key Laboratory of Crop Genetic Improvement and National Centre of Plant Gene Research, Huazhong Agricultural University; ⁴University of Chinese Academy of Sciences; ⁵Center for Excellence in Molecular Plant Sciences, Chinese Academy of Sciences)

Cryo-EM structures of the plant plastid-encoded RNA polymerase

- [P4-4] Takeshi Nakano¹, Ryo Tachibana¹, Susumi Abe², Momo Marugami², Ayumi Yamagami¹, Kentaro Ifuku¹, Tetsuo Kushiro³, Takuya Miyakawa¹, Tadao Asami⁴ (¹Graduate School of Biostudies, Kyoto University, Japan; ²RIKEN, CSRS; ³School of Agriculture, Meiji University; ⁴Graduate School of Agricultural and Life Sciences, University of Tokyo) Research for regulatory mechanism of chloroplast development via brassinosteroid signaling by using BR inhibitor Brz [O4-1]

- [P4-5] Elena Carrasquer-Alvarez¹, Adrian Geissler², Jan Gorodkin², Stefan Seemann², Ute Hoffmann³, Paul Hudson³, Niels-Ulrik Frigaard¹ (¹Department of Biology, University of Copenhagen, Denmark; ²Department of Veterinary and Animal Sciences, University of Copenhagen, Denmark; ³Division of Systems Biology, KTH Royal Institute of Technology, Sweden)

Cyanobacteria on the edge: How very high CO₂ affects photosynthesis [O4-3]

- [P4-6] Yuichi Fujita¹, Shintaro Hida¹, Marie Nishio¹, Kazuma Uesaka^{1,2}, Mari Banba¹, Nobuyuki Takatani¹, Shinichi Takaichi³, Haruki Yamamoto¹, Kunio Ihara² (¹Graduate School of Bioagricultural Sciences, Nagoya University, Japan; ²Center for Gene Research, Nagoya University; ³Department of Molecular Microbiology, Faculty of Life Sciences, Tokyo University of Agriculture)

Genome analysis of dark-adapted variants of the cyanobacterium *Leptolyngbya boryana*: Mutations that suppress photosynthetic growth and promote dark heterotrophic growth [O4-4]

- [P4-7] Ting-Hsuan Chan^{1,2}, Ting-Shuo Nien², Ying-Yang Li^{1,2}, Ting-So Liu², Yo-Jin Hsiau³, Ming-Yang Ho^{1,2} (¹Institute of Plant Biology; ²Department of Life Science; ³Department of Bioenvironmental Systems Engineering, National Taiwan University, Taiwan)

Two cyanobacterial species exhibit stress responses when grown together in visible light or far-red light

- [P4-8] Mayu Chikada¹, Kazuma Uesaka¹, Mari Banba¹, Yuto Hiraide¹, Kunio Ihara², Haruki Yamamoto¹, Yuichi Fujita¹ (¹Graduate School of Bioagricultural Sciences, Nagoya University,

Japan; ²Center for Gene Research, Nagoya University)

A missense mutation in the gene encoding the response regulator RpaB causes loss of photosynthetic growth capacity in the cyanobacterium *Leptolyngbya boryana*

[P4-9] Riku Nakamura¹, Shogo Tachibana¹, Masako Hamada², Yuu Hirose², Yukako Hihara¹ (¹Graduate School of Science and Engineering, Saitama University, Japan; ²Department of Applied Chemistry and Life Science, Toyohashi University of Technology)

Partner-switching components PmgA and Ssr1600 regulate high-light acclimation in *Synechocystis* sp. PCC 6803

[P4-10] Kosei Noto¹, Yuki Hagiwara¹, Koichi Kobayashi², Noriko Nagata³, Sho Fujii¹ (¹Faculty of Agriculture and Life Science, Hirosaki University, Japan; ²Faculty of Liberal Arts, Science and Global Education, Osaka Metropolitan University; ³Faculty of Science, Japan Women's University)

Thylakoid lipid biosynthesis is fundamental for plastid gene expression

[P4-11] Setsuko Wakao¹, Cailyn Sakurai², Vy Duong³, Sara Calhoun³, Krishna Niyogi^{1,2,4} (¹Lawrence Berkeley National Laboratory, Molecular Biophysics and Integrated Bioimaging Division, USA; ²University of California Berkeley, Plant and Microbial Biology Department; ³Lawrence Berkeley National Laboratory, Joint Genome Institute; ⁴Howard Hughes Medical Institute)

Gaining insight into the functions of unknown genes from the multi-omic signatures of photosynthetic mutants [O4-2]

[S6] Protein regulation and turnover

[P6-1] Yusuke Kato^{1,2}, Hiroshi Kuroda³, Shin-Ichiro Ozawa¹, Michael Hippler^{1,4}, Yuichiro Takahashi³, Wataru Sakamoto¹ (¹Institute of Plant Science and Resources, Okayama University, Japan; ²Faculty of Agriculture, Setsunan University, Japan; ³Research Institute for Interdisciplinary Science, Okayama University, Japan; ⁴Institute of Plant Biology and Biotechnology, University of Münster, Germany)

Characterization of tryptophan oxidation affecting D1 degradation by FtsH in photosystem II repair [O6-1]

[P6-2] Yoshitaka Nishiyama, Pornpan Napaumpaiporn (Department of Biochemistry and Molecular Biology, Saitama University, Japan)

Redox regulation of the repair of photosystem II via translation factors [O6-2]

[P6-3] Minh Chau Tran, Masaru Kono, Yuka Fukushi, Toru Hisabori, Keisuke Yoshida (Lab. Chem. Life Sci., Tokyo Tech., Japan)

Functional analysis of Trx-like protein CDSP32 in chloroplast redox regulation

[P6-4] Sujuan Duan, Man Zhang, Qi Shen, Hong-Lei Jin, Hong-Bin Wang (School of Pharmaceutical Sciences, Guangzhou University of Chinese Medicine, China)

Exploring the regulatory mechanism of RAF-like kinases RAF3 and RAF6 involved in chloroplast response to low-temperature stress

[S7] Mechanism of water oxidation in PSII

[P7-1] Mizue Hatsune¹, Takehiro Suzuki², Takumi Matsubara¹, Tomomi Kitajima-Ihara¹, Minako Hirano¹, Yuichiro Shimada¹, Yuki Kato¹, Naoshi Dohmae², Takumi Noguchi¹ (¹Graduate School of Science, Nagoya University, Japan; ²Biomolecular Characterization Unit, RIKEN Center for Sustainable Resource Science)

Post-translational conversion of aliphatic amino acids to form carboxylate ligands in the oxygen-evolving complex in photosystem II

[P7-2] Shinya Kosaki¹, Yoshiki Nakajima², Jian-Ren Shen², Hiroyuki Mino¹ (¹Grad. Sch. Sci., Nagoya Univ., Japan; ²Res. Inst. Interdiscip. Sci., Okayama Univ.)

Magnetic structural analysis of S₂ high-spin states manganese cluster in photosystem II by multi-frequency electron paramagnetic resonance (EPR) spectroscopy [O7-1]

[P7-3] Hao-Wei Jiang¹, Yoshiki Nakajima¹, Fusamichi Akita¹, Hongjie Li¹, Koji Kato¹, Miwa Sugiura², Jian-Ren Shen¹ (¹Research Institute for Interdisciplinary Science, Okayama University, Japan; ²Proteo-Science Research Center, Ehime University)

Cryo-EM structure of photosystem II D1-V185T mutant from *Thermosynechococcus elongatus*

[P7-4] Yoshiki Nakajima^{1,2}, Naoki Matsubara², Jian-Ren Shen^{1,2} (¹Research Institute for Interdisciplinary Science and Graduate School of Natural Science and Technology, Okayama University, Japan; ²Graduate School of Natural Science and Technology, Okayama University) Different binding modes of herbicides in photosystem II revealed by crystal structure analysis

[P7-5] Ko Imaizumi¹, Shin-ichi Arimura², Taishi Nishimura³, Ryo Nagao^{4,5}, Keisuke Saito^{6,7}, Takeshi Nakano³, Hiroshi Ishikita^{6,7}, Takumi Noguchi⁴, Kentaro Ifuku¹ (¹Graduate School of Agriculture, Kyoto University, Japan; ²Graduate School of Agricultural and Life Sciences, The University of Tokyo; ³Graduate School of Biostudies, Kyoto University; ⁴Graduate School of Science, Nagoya University; ⁵Faculty of Agriculture, Shizuoka University; ⁶Research Center for Advanced Science and Technology, The University of Tokyo; ⁷Department of Applied Chemistry, The University of Tokyo)

PsbP-D139N mutation enhances the water oxidation activity of photosystem II [O5-1]

[P7-6] Takeru Kanda¹, Yoshiki Nakajima^{1,2}, Jian-Ren Shen^{1,2} (¹Graduate School of Environmental,

Life, Natural Science and Technology, Okayama University, Japan; ²Research Institute for Interdisciplinary Science, Okayama University)

Search for rare earth elements that can substitute for Ca in the Mn₄CaO₅ cluster of photosystem II of the thermophilic cyanobacterium *Thermotichus vulcanus*

[P7-7] Hiroshi Isobe¹, Takayoshi Suzuki¹, Michihiro Suga¹, Jian-Ren Shen¹, Kizahi Yamaguchi² (¹Research Institute for Interdisciplinary Science, Okayama University, Japan; ²Center for Quantum Information and Quantum Biology, Osaka University)

Statistical insights into the significance of collective motion within the primary coordination sphere of the Mn₄CaO₆ cluster in determining the catalytic progression for O₂ evolution [O7-2]

[P7-8] Keisuke Saito^{1,2}, Shunya Nishio², Yang Chen², Hiroshi Ishikita^{1,2} (¹Research Center for Advanced Science and Technology, The University of Tokyo, Japan; ²Department of Applied Chemistry, The University of Tokyo)

Proton behavior in the oxygen-evolving cluster during the S₂ to S₃ transition

[P7-9] Kizashi Yamaguchi^{1,2,3}, Koichi Miyagawa², Mitsuo Shoji⁴, Hiroshi Isobe⁵, Takashi Kawakami^{3,6}, Jian-Ren Shen⁵ (¹Center for Quantum Information and Quantum Biology, Osaka University, Japan; ²SANKEN, Osaka University; ³RIKEN Center for Computational Science; ⁴Center of Computational Sciences, University of Tsukuba; ⁵Research Institute for Interdisciplinary Science, and Graduate School of Natural Science and Technology, Okayama University; ⁶Graduate School of Science, Osaka University)

Relative stability and electronic structures during S₁–S₂–S₃ transitions of the CaMn₄O_x cluster in photosystem II by CC and DFT calculations

[P7-10] Mitsuo Shoji¹, Koichi Miyagawa², Yasutaka Shigeta¹, Kizashi Yamaguchi² (¹Center for Computational Sciences, University of Tsukuba, Japan; ²Institute of Scientific and Industrial Research, Osaka University)

Reaction mechanisms of water oxidation in natural and artificial photosynthesis

[S8] CO₂ fixation and crop yield improvement

[P8-1] Ginga Shimakawa^{1,2}, Yusuke Matsuda² (¹Graduate School of Agricultural Science, Kobe University, Japan; ²School of Biological and Environmental Sciences, Kwansei Gakuin University)

TurboID reveals intrinsically disordered proteins interacting with pyrenoid shell in the marine diatom *Phaeodactylum tricorutum*

[P8-2] Canceled

[P8-3] Robert Sharwood¹, Grant Pearce², Maria Ermakova³, Robert T Furbank⁴, Oula Ghannoum¹

(¹Western Sydney University, Australia; ²University of Canterbury, New Zealand; ³Monash University, Australia; ⁴Australian National University, Australia)

Supercharging the carbon concentrating mechanism in C₄ plants [O8-2]

[P8-4] Ryo Yamauchi¹, Mitsunori Seo², Wataru Yamori¹ (¹Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan; ²Tropical Biosphere Research Center, University of the Ryukyus)

Unveiling the role of ABA transporter, NPF4.6: enhancing photosynthesis through stomatal control [O8-1]

[P8-5] Hiroo Takaragawa¹, Tomoki Asahi², Ryutaro Matsumoto², Muneshi Mitsuoka^{2,3}, Eizo Taira², Yoshinobu Kawamitsu² (¹Trop. Agric. Res. Front, Jpn. Int. Res. Cent. Agric. Sci., Japan; ²Fac. Agric., Univ. Ryukyus; ³Fac. Agric., Kyusyu Univ.)

Low-cost measurement of leaf gas exchange using custom-built system with single-board microcomputer: attempts and perspectives

[P8-6] Ken'ichiro Matsumoto¹, Akihiro Nagata², Yuki Kudoh², Haruki Fujiwara², Shuhei Watanabe², Yuzuki Akutagawa², Naoki Matsumoto³, Miyuki Kita³, Shin-ichi Hachisuka¹, Hiroshi Kikukawa¹, Hiroki Ashida³ (¹Faculty of Engineering, Hokkaido University, Japan; ²Graduate School of Chemical Sciences and Engineering, Hokkaido University; ³Graduated School of Human Development and Environment, Kobe University)

In vitro directed evolution of RuBisCO using bacterial polyhydroxyalkanoate as metabolic indicator

[P8-7] Shin-Ichi Miyazawa (Department of Forest Molecular Genetics and Biotechnology, Forestry and Forest Products Research Institute (FFPRI), Japan)

Revisiting photorespiratory metabolism in conifers, an ancient plant lineage

[P8-8] Mao Suganami^{1,2}, Yoon Dong-Kyung², Ryo Maruhashi², Yuta Yahiro², Hiroyuki Ishida², Hiroshi Yamamoto³, Toshiharu Shikanai³, Yuji Suzuki⁴, Amane Makino² (¹Institute of Fermentation Sciences, Fukushima University, Japan; ²Graduate School of Agricultural Science, Tohoku University; ³Graduate School of Science, Kyoto University; ⁴Faculty of Agriculture, Iwate University)

Overproduction of Rubisco, Rubisco activase, and flavodiiron protein improves photosynthesis without the fragility of photosystem I in rice [O5-4]

[P8-9] Kao Fujimoto, Kirana Luthfia Nayatami, Jun-Ichi Sakagami (Graduate School of Agriculture, Forestry and Fisheries, Kagoshima University, Japan)

Photosynthetic reactions during drought stress and subsequent rewatering in newly developed sugarcane cultivar "Harunoogi" [O8-4]

[P8-10] Grant Pearce¹, Robert Sharwood² (¹Biomolecular Interactions Center & School of Biological Science, University of Canterbury, New Zealand; ²Hawkesbury Institute for the

Environment, Western Sydney University, Australia)

Examining plant PEPC conformation: insights from solution-based techniques

[P8-11] Rin Yokoe, Saki Ueda, Tsuyoshi Furumoto (Ryukoku University, Japan)

Evaluation of the physiological significance of phosphoenolpyruvate carboxylase phosphorylation in C4 photosynthesis

[P8-12] Kazuki Taniyoshi¹, Sotaro Honda², Airi Miyamoto³, Naomi Asagi³, Makoto Matsuoka⁴, Wataru Yamori⁵, Yu Tanaka⁶, Shunsuke Adachi² (¹Graduate School of Agriculture, Kyoto University, Japan; ²Graduate School of Agriculture, Tokyo University of Agriculture and Technology; ³College of Agriculture, Ibaraki University; ⁴Institute of Fermentation Science, Fukushima University; ⁵Graduate School of Agricultural and Life Science, The University of Tokyo; ⁶Graduate School of Environmental and Life Science, Okayama University)

Genetic diversity of leaf photosynthesis under fluctuating light condition between temperate *japonica* rice cultivar [O8-3]

[P8-13] Kenya Tanaka^{1,2}, Tomokazu Shirai^{2,3}, Mami Matsuda², Akihiko Kondo^{1,2,3,4}, Tomohisa Hasunuma^{1,2,3} (¹Engineering Biology Research Center, Kobe University, Japan; ²Graduate School of Science, Innovation and Technology, Kobe University; ³RIKEN Center for Sustainable Resource Science; ⁴Graduate School of Engineering, Kobe University)

Metabolism for photosynthetic induction in cyanobacteria

[P8-14] Daisuke Sugiura, Yui Kataoka, Yuri Hirose (Graduate School of Bioagricultural Science, Nagoya University, Japan)

Drought-induced changes in photosynthetic capacity of major C₃ and C₄ crops evaluated with the microcontroller-based water control system

[P8-15] Arindam Deb¹, Ameena M², N Jose², VS Sethulakshmi², Shalini Pillai P², RV Manju², Pratheesh P Gopinath², Demi Sargent¹, Robert Sharwood¹ (¹Hawkesbury Institute for the Environment, Western Sydney University, Australia; ²College of Agriculture, Vellayani, Kerala Agricultural University, India)

Rice production into the future: impact of biotic (weeds) and abiotic stress

[P8-16] Sotaro Honda¹, Satoshi Ohkubo², Daiki Miyashita¹, Makoto Kashima³, Taiichiro Ookawa¹, Atsushi J. Nagano⁴, Shunsuke Adachi¹ (¹Graduate School of Agriculture, Tokyo University of Agriculture and Technology, Japan; ²Graduate School of Life Sciences, Tohoku University; ³Faculty of Science, Toho University; ⁴Faculty of Agriculture, Ryukoku University)

Predicting dynamics of leaf photosynthesis in field-grown rice using transcriptome-based statistical modeling

[P8-17] Jun Tominaga^{1,2}, Joseph R. Stinziano^{1,3}, David T. Hanson¹, Yoshinobu Kawamitsu⁴ (¹Department of Biology, The University of New Mexico, USA; ²Graduate School of

Integrated Sciences for Life, Hiroshima University, Japan; ³Canadian Food Inspection Agency, Canada; ⁴Faculty of Agriculture, University of the Ryukyus, Japan)

Dynamic non-stomatal factors of transpiration in leaves under water deficits

[P8-18] Yui Tobita¹, Sotaro Honda¹, Atsushi Arakaki², Soh Sugihara¹, Taiichiro Ookawa¹, Shunsuke Adachi¹ (¹Graduate School of Agriculture; ²Graduate School of Engineering, Tokyo University of Agriculture and Technology)

Ionome analysis toward understanding genetic variation of leaf photosynthesis among temperate *japonica* rice varieties

[P8-19] Boon Leong Lim (School of Biological Sciences, University of Hong Kong, China)

Protein import can modulate chloroplast and mitochondrial activities to boost photosynthesis and productivity

[P8-20] Danying Lu, Boon Leong Lim* (School of Biological Sciences, University of Hong Kong, China)

NADP-ME2: A Crucial Supplier of Cytosolic NADPH for Arabidopsis Root

[P8-21] Fusang Liu^{1,2}, Guichao Yu¹, Wenfeng Wu³, Pengfei Zhou¹, Paul C. Struik², Xinyou Yin^{2,*}, Xin-Guang Zhu^{1,*} (¹Shanghai Institute of Plant Physiology and Ecology, Chinese Academy of Sciences, China; ²Department of Plant Sciences, Wageningen University & Research, Netherlands; ³College of Land Science and Technology, China Agricultural University, China)

The potential of accelerating long-term light acclimation on canopy photosynthetic carbon gain

[S9] Photosynthetic membrane complex: structure and function

[P9-1] Viviana Pasch, Bennet Reiter, Lea Rosenhammer, Dario Leister, Thilo Rühle (Plant Molecular Biology Faculty of Biology I, Ludwig-Maximilians-Universität Munich, Germany)

AtPAF1 –a novel chloroplast ATP synthase assembly factor [O5-3]

[P9-2] Pi-Cheng Tsai, Jian-Ren Shen, Fusamichi Akita (Research Institute for Interdisciplinary Science, and Graduate School of Environmental, Life, Natural Science and Technology, Okayama University, Japan)

Cryo-EM structure of a photosystem I supercomplex from an oleaginous green alga *Coccomyxa subellipsoidea* at an atomic resolution [O5-2]

[P9-3] Liangliang Shen^{1,2,3}, Yuanzhu Gao³, Kailu Tang⁴, Wenda Wang^{1,2}, Min Chen⁵, Tingyun Kuang^{1,2}, Xing Zhang⁴, Jian-Ren Shen^{1,2,6}, Peiyi Wang³, Guangye Han^{1,2} (¹Institute of Botany, Chinese Academy of Sciences, China; ²China National Botanical Garden, China; ³Cryo-EM Centre, Southern University of Science and Technology, China; ⁴Center of Cryo-Electron

Microscopy, Zhejiang University School of Medicine, China; ⁵Faculty of Science, University of Sydney, Australia; ⁶Institute for Interdisciplinary Science, and Graduate School of Natural Science and Technology, Okayama University, Japan.)

Structure of a unique PSII-Pcb tetrameric megacomplex in a chlorophyll *d*-containing cyanobacterium

[P9-4] Lamis Abdelhakim¹, Klára Panzarová¹, Markus Teige² (¹PSI (Photon Systems Instruments), Czech Republic; ²Department of Functional & Evolutionary Ecology, University of Vienna, Austria)

Image-based phenotyping protocol revealed the dynamic responses under combined abiotic stresses in potato plants

[P9-5] Jianyu Shan^{1,2}, Dariusz M. Niedzwiedzki^{3,4}, Rupal S. Tomar⁵, Zhenfeng Liu^{1,2,*}, Haijun Liu^{5,*} (¹Institute of Biophysics, Chinese Academy of Science, China)

Architecture and functional regulation of a plant PSII-LHCII megacomplex

[P9-6] Hiromasa Kodama¹, Keiichiro Tanigawa¹, Masaru Kono², Ichiro Terashima¹, Wataru Yamori¹ (¹Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan; ²Exo-Life Search Project Office, Astrobiology Center)

Cytochrome *b6/f* complex and H⁺-ATPase are key factors controlling chloroplast electron transport and photosynthetic rate

[P9-7] Man QI¹, Henry N. TAUNT¹, Martina BEČKOVA², Zhi XIA¹, Josef KOMENDA², Peter J. NIXON¹ (¹Department of Life Sciences, Imperial College London, UK; ²Institute of Microbiology of the Czech Academy of Sciences, Center Algatech, Czech Republic)

Engineering photosystem II to bind chlorophyll *f* [O9-2]

[P9-8] Makiko Kosugi¹, Masato Kawasaki², Yutaka Shibata³, Kojiro Hara⁴, Shinichi Takaichi⁵, Toshio Moriya², Naruhiko Adachi⁶, Yasuhiro Kamei¹, Yasuhiro Kashino⁷, Sakae Kudoh⁸, Hiroyuki Koike⁹, Toshiya Senda², Shuji Ohtani¹⁰, Atsushi Toyoda¹¹, Hiroyo Nishide¹, Shin-Ichiro Ozawa¹², Yuichiro Takahashi¹³, Jun Minagawa¹ (¹National Institute for Basic Biology, Japan; ²High Energy Accelerator Research Organization (KEK); ³Tohoku University; ⁴Akita Prefectural University; ⁵Tokyo University of Agriculture; ⁶Tsukuba University; ⁷University of Hyogo; ⁸National Institute of Polar Research; ⁹Chuo University; ¹⁰Shimane University; ¹¹National Institute of Genetics; ^{12,13}Okayama University)

Far-red LHC allows uphill energy transfer for photosynthesis in an Antarctic alga, *Prasiola crispa*

[P9-9] Daisuke Yamamoto, Nami Yamano (Faculty of Science, Fukuoka University, Japan)

Observation of thylakoid membrane by constant thermal fluctuation mode atomic force microscopy

[P9-10] Sireesha Kodru¹, Sreedhar Nellaepalli¹, Shin-Ichiro Ozawa^{1,2}, Chihiro Satoh¹, Hiroshi

Kuroda¹, Ryouichi Tanaka³, Katharine Guan⁴, Marilyn Kobayashi^{4,5}, Phoi Tran⁴, Sarah McCarthy⁴, Setsuko Wakao^{4,6}, Krishna K Niyogi^{4,5,6,7}, Yuichiro Takahashi¹ (¹Research Institute for Interdisciplinary Science, Okayama University, Japan; ²Institute of Plant Science and Resources, Okayama University, Japan; ³Institute of Low Temperature Science, Hokkaido University, Japan; ⁴Department of Plant and Microbial Biology, University of California, USA; ⁵Howard Hughes Medical Institute, University of California, USA; ⁶Molecular Biophysics and Integrated Bioimaging Division, Lawrence Berkeley National Laboratory, USA; ⁷Innovative Genomics Institute, University of California, USA)

Geranylgeranylated-chlorophyll-protein complexes in *lhl3* mutant of the green alga *Chlamydomonas reinhardtii*

[P9-11] Xiaoyi Li¹, Zhenhua Li^{1,2}, Fangfang Wang³, Jian-Ren Shen^{1,4,5}, Wenda Wang^{1,4} (¹Institute of Botany, Chinese Academy of Sciences, China; ²University of Chinese Academy of Science, China; ³National Facility for Protein Science in Shanghai, Chinese Academy of Sciences, China; ⁴China National Botanical Garden, China; ⁵Graduate School of Natural Science and Technology, Okayama University, Japan)

Structures and organizations of PSI-AcpPCI supercomplexes from red tidal and coral symbiotic photosynthetic dinoflagellates

[P9-12] Romain La Rocca, Koji Kato, Pi-Cheng Tsai, Fusamichi Akita, Jian-Ren Shen (Research Institute for Interdisciplinary Science, and Graduate School of Environmental, Life, Natural Science and Technology, Okayama University, Japan)

Cryo-EM structure of a PSI-antennas supercomplex from *C. Roscoffensis*, a representant of coccolithophores

[P9-13] Simona Streckaite¹, Cristian Iliaoaia², Jevgenij Chmeliov^{1,3}, Andrius Gelzinis^{1,3}, Dmitriij Frolov², Leonas Valkunas¹, Andrew Gall², Bruno Robert² (¹Department of Molecular Compound Physics, Center for Physical Sciences and Technology, Lithuania; ²Université Paris-Saclay, CEA, CNRS, Institute for Integrative Biology of the Cell (I2BC), France; ³Faculty of Physics, Vilnius University, Lithuania)

Organization of 3D Plant thylakoid membranes as seen by high resolution microscopy

[P9-14] Koji Kato¹, Tasuku Hamaguchi², Minoru Kumazawa³, Yoshiki Nakajima¹, Kentaro Ifuku³, Yuu Hirose⁴, Keisuke Kawakami⁵, Koji Yonekura^{2,5}, Ryo Nagao⁶, Jian-Ren Shen¹ (¹Research Institute for Interdisciplinary Science, Okayama University, Japan; ²Institute of Multidisciplinary Research for Advanced Materials, Tohoku University; ³Graduate School of Agriculture, Kyoto University, Japan; ⁴Department of Applied Chemistry and Life Science, Toyohashi University of Technology; ⁵Biostructural Mechanism Laboratory, RIKEN SPring-8 Center; ⁶Faculty of Agriculture, Shizuoka University)

Cryo-EM structure of PSI-LHCI from a red alga *Cyanidium caldarium*

- [P9-15] Kentaro Usui¹, Haruki Yamamoto¹, Hitoshi Mori^{1,2}, Yuichi Fujita¹ (¹Graduate School of Bioagricultural Sciences; ²Institute for Glyco-core Research, Nagoya University, Japan)
Extracellular vesicle-mediated secretion of chlorophyll biosynthetic intermediates in the cyanobacterium *Leptolyngbya boryana*
- [P9-16] Haruya Ogawa¹, Shigeki Ehira², Takehiro Suzuki³, Yoshiki Nakajima¹, Koji Kato¹, Naoshi Dohmae³, Ryo Nagao⁴, Jian-Ren Shen¹ (¹Research Institute for Interdisciplinary Science and Graduate School of Environmental, Life, Natural Science and Technology, Okayama University, Japan; ²Graduate School of Science, Tokyo Metropolitan University; ³Biomolecular Characterization Unit, RIKEN Center for Sustainable Resource Science; ⁴Faculty of Agriculture, Shizuoka University)
Biochemical characterization of the deletion mutants of *isiA* genes in *Anabaena* sp. PCC 7120
- [P9-17] Ji Won Kim¹, Kentaro Usui¹, Haruki Yamamoto¹, Mitsutaka Taniguchi¹, Takao Oi¹, Yuichi Fujita¹ (¹Graduate School of Bioagricultural Sciences, Nagoya University, Japan)
Cyanobacterial etiolation process of a mutant lacking light-independent chlorophyll biosynthesis
- [P9-18] Jiyu Xin^{1,2†}, Zhenzhen Min^{1,2†}, Lu Yu^{3†}, Xinyi Yuan^{1,2,4†}, Aokun Liu^{3,5}, Wenping Wu^{1,2}, Xin Zhang^{1,2,4}, Huimin He⁴, Jingyi Wu^{1,2,4}, Yueyong Xin⁴, Robert E. Blankenship^{6,7}, Changlin Tian^{3,5}, Xiaoling Xu^{1,2,4,*} (¹School of Basic Medical Sciences, Hangzhou Normal University, China)
Cryo-EM structure of HQNO-bound alternative complex III from the anoxygenic phototrophic bacterium *Chloroflexus aurantiacus*
- [P9-19] Soma Kawamura, Makio Yokono, Chiyo Noda, Jun Minagawa (National Institute for Basic Biology, Japan) [O9-1]
NPQ mechanism of the desiccation- tolerant green alga *C. ohadii*
- [P9-20] Keisuke Kawakami¹, Tasuku Hamaguchi², Kyoko Shinzawa-Itoh³, Natsuko Inoue-Kashino³, Shigeru Itoh⁴, Kentaro Ifuku⁵, Eiki Yamashita⁶, Kou Maeda³, Koji Yonekura¹, Yasuhiro Kashino³ (¹Biostructural Mechanism Laboratory, RIKEN SPring-8 Center, Japan; ²Institute of Multidisciplinary Research for Advanced Materials, Tohoku University; ³Graduate School of Science, University of Hyogo; ⁴Graduate School of Science, Nagoya University; ⁵Graduate School of Agriculture, Kyoto University; ⁶Institute for Protein Research, Osaka University)
Structure of the far-red light utilizing photosystem I of *Acaryochloris marina*
- [P9-21] Yoshiki Shirotori¹, Kimie Atsuzawa², Egi tritya Apdila³, Yasuko Kaneko², Koichiro Awai³, Shigeki Ehira¹ (¹Graduate School of Science, Tokyo Metropolitan University, Japan; ²Graduate School of Science and Engineering, Saitama University; ³Graduate School of Science and Technology, Shizuoka University)

Discovery of a novel thylakoid membrane-bound protein that is involved in the construction of photosystem complex and thylakoid membrane in cyanobacteria

[P9-22] Haruhiko Jimbo¹, Kensuke Takagi², Hajime Wada² (¹Graduate School of Science and Engineering, Saitama University, Japan; ²Graduate School of Arts and Sciences, University of Tokyo) [O9-3]

Cyanobacterial lipid remodeling in the response to environmental stresses

[P9-23] Aynura Pashayeva^{1,2}, Guangxi Wu², Ismayil S. Zulfugarov¹, Irada Huseynova¹, Choon-Hwan Lee² (¹Institute of Molecular Biology and Biotechnologies, Ministry of Science and Education of the Republic of Azerbaijan, Azerbaijan; ²Department of Molecular Biology, Pusan National University, Korea)

Regulation of chlorophyll fluorescence energy-dependent quenching through thylakoid protein phosphorylation in rice plants

[P9-24] Keisuke Kawakami¹, Saori Maki-Yonekura¹, Kyoko Shinzawa-Itoh², Natsuko Inoue-Kashino², Shigeru Itoh³, Kentaro Ifuku⁴, Koji Yonekura^{1,5}, Yasuhiro Kashino² (¹Biostructural Mechanism Laboratory, RIKEN SPring-8 Center, Japan; ²Graduate School of Science, University of Hyogo; ³Graduate School of Science, Nagoya University; ⁴Graduate School of Agriculture, Kyoto University; ⁵Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan)

Structure of the far-red light utilizing photosystem II interacting with chlorophyll-binding protein (CBP) from *Acaryochloris marina* at 2.4 Å resolution

[P9-25] Chiasa Uragami¹, Marina Yoshida¹, Alastair T. Gardiner², Richard J. Cogdell³, Hideki Hashimoto¹ (¹Department of Applied Chemistry for Environment, Kwansei Gakuin University, Japan; ²Czech Academy of Sciences, Institute of Microbiology, Czech Republic; ³University of Glasgow, Institute of Molecular, Cell and Systems Biology, UK)

Carotenoid-bacteriochlorophyll *a* energy transfer mechanisms in purple photosynthetic bacteria *Rhodobacter sphaeroides* [O9-4]

[P9-26] Anthony William Larkum¹, Maria Ermakova², John Albert Raven³, Duncan Fitzpatrick⁴ (¹University of Technology Sydney, Australia; ²Monash University; ³University of Dundee; ⁴Australian National University)

Photosynthesis with only photosystem I

[P9-27] Linxiong Mao^{1,2,7}, Yingjie Wang^{3,7}, Runrui Yu^{1,2,7}, Yajun Lin¹, Pengfei Zhou^{1,4}, Meixia Ruan^{5,2}, Qingfeng Song¹, Huiqiong Zheng¹, Yuxiang Weng^{5,2,6}, Minrui Fan^{1,*}, Xin-Guang Zhu^{1,*} (¹Shanghai Institute of Plant Physiology and Ecology, Chinese Academy of Sciences, Shanghai, China; ²University of Chinese Academy of Sciences; ³Shenzhen Bay Laboratory; ⁴Tongji University; ⁵Institute of Physics, Chinese Academy of Sciences; ⁶Songshan Lake Materials Laboratory)

Crystal determination reveals that the core amino acid of P132 plays a crucial role in the function state of PsbS

[S10] Ecophysiology

[P10-1] Raymond J. RITCHIE, Suhailar SMA-AIR, Vipawee DUMMEE (Faculty of Technology and Environment, Prince of Songkla University in Phuket, Thailand)

Photosynthesis in a soft coral

[P10-2] Ko Noguchi¹, Koki Hashimoto¹, Yusuke Mizokami¹, Junko Kishimoto², Ryouichi Tanaka² (¹Laboratory of Applied Ecology, Tokyo University of Pharmacy and Life Sciences, Japan; ²Institute of Low Temperature Science, Hokkaido University)

Seasonal changes in regulation of the photosynthetic electron transport system in leaves of herbaceous species in deciduous forest understory

[P10-3] Yusuke Mizokami, Rion Tamura, Hiromu Matsubara, Hinata Kaneda, Ko Noguchi (Laboratory of Applied Ecology, Tokyo University of Pharmacy and Life Sciences, Japan)

Seasonal variation in photosynthetic utilization of CO₂ derived from soil respiration in *Asarum tamaense* growing on the forest understory

[P10-4] Rael CHEPKOECH¹, Isao AKAGI¹, Amzad HOSSAIN^{1,2}, Jun-Ichi SAKAGAMI¹ (¹The United Graduate School of Agricultural Science, Kagoshima University, Japan; ²Faculty of Agriculture, University of Ryukyus)

Combined effects and avoidant mechanism of excess iron under excessive light energy on NERICA4 rice cultivar

[P10-5] Ching-Nen Nathan Chen¹, Keng-Min Lin², Yu-Chen Lin², Hsin-Ying Chang², Tze Ching Yong¹, Yi-Fang Chiu², Chih-Horng Kuo², Hsiu-An Chu² (¹Department of Oceanography, National Sun Yat-sen University, Taiwan; ²Institute of Plant and Microbial Biology, Academia Sinica)

Comparative genomic analysis of a novel heat-tolerant and euryhaline strain of unicellular marine cyanobacterium *Cyanobacterium* sp. DS4 from a high-temperature lagoon

[P10-6] Yuqi Zhang¹, Elias Kaiser², Satadal Dutta³, Thomas D. Sharkey⁴, Leo F.M. Marcelis², Tao Li¹ (¹Institute of Environment and Sustainable Development in Agriculture, Chinese Academy of Agriculture Sciences, China; ²Department of Plant Sciences, Wageningen University, the Netherlands; ³Faculty of 3ME, TU Delft, the Netherlands; ⁴Plant Resilience Institute, and Department of Biochemistry and Molecular Biology, Michigan State University, USA)

Short-term salt stress reduces photosynthetic oscillations under triose phosphate utilization limitation in tomato [O10-1]

- [P10-7] Yu-Ting Huang¹, Ying-Yang Li^{1,2}, Jui-Tse Ko¹, Ming-Yang Ho^{1,2} (¹Department of Life Science; ²Institute of Plant Biology, National Taiwan University, Taiwan)
Identifying treatments that increase the relative abundance of cyanobacteria during enrichment
- [P10-8] Yuta Kato¹, Kaori Kohzuma¹, Takao Oi², Yoshikatsu Sato³, Mitsutaka Taniguchi⁴, Kentaro Ifuku¹ (¹Graduate School of agricultural Sciences, Kyoto University, Japan; ²School of Science and Engineering, Kochi University of Technology; ³Institute of Transformative Bio-Molecules, Nagoya University; ⁴Graduate School of Bioagricultural Sciences, Nagoya University)
Investigation of C₄ photosynthesis by live leaf-section imaging [O10-2]
- [P10-9] Baptiste Genot, Shinichiro Maruyama (Graduate School of Frontier Sciences, The University of Tokyo, Japan)
Deciphering roles of ethylene on photosynthesis regulation in non-model algae [O10-3]
- [P10-10] Kenji Takizawa, Aoi Murakami (Astrobiology Center, Japan; National Institute for Basic Biology; The Graduate University for Advanced Studies, SOKENDAI)
Vegetation red edge on habitable exoplanets
- [P10-11] Riichi Oguchi¹, Barry Osmond^{2,3}, Wah Soon Chow³ (¹Osaka Metropolitan University, Japan; ²School of Earth, Atmospheric and Life Sciences, University of Wollongong, Australia; ³The Australian National University, Australia)
Intraspecific variation in temperature response of the quantum yield of PSI and PSII among *Arabidopsis thaliana* ecotypes [O10-4]
- [P10-12] Genki Horiguchi¹, Yusuke Mizokami¹, Naoki Hirotsu², Hiroshi Fukayama³, Ko Noguchi¹ (¹Tokyo University of Pharmacy and Life Sciences, Japan; ²Toyo University; ³Kobe University)
Amphibious plant *Hygrophila difformis* expresses different RbcS isoforms between the terrestrial and submerged leaves
- [P10-13] Aoi Murakami^{1,2,3}, Eunchul Kim^{2,3}, Jun Minagawa^{2,3}, Kenji Takizawa^{1,2,3} (¹Astrobiology Center, Japan; ²National Institute for Basic Biology; ³The Graduate University for Advanced Studies, SOKENDAI)
Physiological and environmental impacts of the heat production by NPQ
- [P10-14] Alonso ZAVAFER^{1,2}, Cristian MANCILLA², Harvey BATES³ (¹Department of Biological Sciences, Brock University, Canada; ²Department of Engineering, Brock University, Canada; ³Faculty of Engineering, University of Technology Sydney, Australia)
Open-JIP³: a customizable chlorophyll fluorometer to monitor photosynthetic barks and stems
- [P10-15] Jingqi Zhang, Kouki Hikosaka, Hajime Tomimatsu (Graduate School of Life Sciences, Tohoku University, Japan)

Dynamic changes in photosynthesis, fluorescence, and spectral reflectance of three types of poplar under varying light intensity

[P10-16] Shoko Tsuji¹, Masaru Kobayashi¹, Kentaro Ifuku¹, Kouki Hikosaka² (¹Graduate School of Agriculture, Kyoto University, Japan; ²Graduate School of Life Sciences, Tohoku University)

Seasonal variation in the rate constants for photodamage to PSII and PSII repair in diverse woody plants

[P10-17] Yajun Lin¹ Yuanming Zhang², Xinguang Zhu^{1,*} (¹CAS Center for Excellence in Molecular Plant Sciences Chinese Academy of Sciences, China; ²Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences)

Ephemeral plants are promising materials for studying of light energy use efficiency and photoprotection under stress

[S11] Chloroplast metabolism and biogenesis

[P11-1] Wangpin Wu^{1,2}, Keun-Pyo Lee¹, Mengping Li¹, Chanhong Kim^{1,2} (¹CAS Center for Excellence in Molecular Plant Sciences (CEMPS), Chinese Academy of Sciences, China; ²University of the Chinese Academy of Sciences)

Unveiling a Chloroplast-Linked Cell Death Pathway: Insights into Photosynthetic ROS and Lipid Peroxidation

[P11-2] Hisashi Ito¹, Masaki Abe^{1,2}, Saki Ando^{1,2}, Ryouichi Tanaka¹ (¹Institute of Low Temperature Science; ²Graduate School of Environmental Science, Hokkaido University, Japan)

Enzymatic activity of Mg-dechelate involved in chlorophyll degradation *in planta* and *in vitro*

[P11-3] Takanari Nemoto¹, Kazuma Sakoda², Atsushi Sakurai², Sousuke Imamura², Shinji Masuda¹ (¹Department of Life Science and Technology, Tokyo Institute of Technology, Japan; ²Space Environment and Energy Laboratories, Nippon Telegraph and Telephone Corporation)
Regulation of Nuclear Gene Expression by the Plastidial Signaling Molecule, ppGpp, in Response to Nitrogen Availability [O11-1]

[P11-4] Soma Sato^{1,2}, Mitsuaki Hirose⁴, Hitoshi Tamiaki³, Ryouichi Tanaka², Hisashi Ito² (¹Graduate School of Environmental Science, Hokkaido University, Japan; ²Institute of Low Temperature Science, Hokkaido University; ³Department of Science and Technology, Seikei University; ⁴Graduate School of Life Sciences, Ritsumeikan University)

Exploring the multifaceted catalytic activity of Mg extracting enzyme: demetallation and chelation in chlorophyll derivatives

[P11-5] Akiko Yoshihara¹, Miho Kuratani¹, Keiko Kobayashi², Noriko Nagata², Koichi Kobayashi¹ (¹Graduate School of Science, Osaka Metropolitan University, Japan; ²Faculty of Science, Japan Women's University)

Two bilayer-forming glycolipids DGDG and SQDG maintain the architecture and functions of the thylakoid membrane

[P11-6] Takumi Ito¹, Hayate Machino¹, Ryusei Inoue¹, Tsuyoshi Furumoto², Kenji Nishimura¹, Yuri N. Munekeg¹ (¹School of Science and Technology, Kwansei Gakuin University, Japan; ²Faculty of Agriculture, Ryukoku University)

RETICULATA RELATED 3 localized to the chloroplast inner envelope is involved in transcription of the chloroplast genome

[P11-7] Gen Takenaka¹, Kotaro Ogasa¹, Maya Tatsumi², Daichi Suwa², Satomi Takeda¹ (¹Graduate School of Science, Osaka Metropolitan University, Japan; ²College of Life, Environment, and Advanced Sciences, Osaka Prefecture University)

Characteristics of the photosynthetic function of photoautotrophically cultured green cells of *Arabidopsis* [O11-2]

[S12] Biofuels and artificial photosynthesis

[P12-1] Hao Xie, Barbara Bourgade, Karin Stensjo, Peter Lindblad (Microbial Chemistry, Department of Chemistry-Angstrom Laboratory, Uppsala University, Sweden)

Target mapping using multiplexed CRISPR interference for isobutanol and 3-methyl-1-butanol production in cyanobacteria

[P12-2] Changhui Chen, Chunxi Zhang* (Institute of Chemistry, Chinese Academy of Sciences, China)

Mimicking the oxygen-evolving center in photosystem II

[P12-3] Saki Kichishima, Hitoshi Tamiaki (Graduate School of Life Sciences, Ritsumeikan University, Japan)

Synthesis of pheophytin–quinone conjugates and their physical properties in solution [O12-2]

[P12-4] Haruna Yamanari¹, Natsuko Inoue-Kashino¹, Yuri Nishino¹, Atsuo Miyazawa¹, Kentaro Ifuku², Yasuhiro Kashino¹ (¹Graduate School of Science, University of Hyogo, Japan; ²Graduate School of Agriculture, Kyoto University)

Mass-culture of a diatom *Chaetoceros calcitrans* in an open-air system

[P12-5] Yusuke Tsukatani¹, Hitoshi Tamiaki², Shinji Masuda³ (¹Biogeochemistry Research Center, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan; ²Graduate School of Life Sciences, Ritsumeikan University; ³Department of Life Science and

Technology, Tokyo Institute of Technology)

Elucidating and engineering pigment biosynthetic pathways committed by chlorophyllide oxidoreductase and chlorophyll synthase

[P12-6] Kaoru MORIMOTO¹, Yusuke OHNISHI¹, Yuko MISUMI¹, Yasuhiro KOTEISHI¹, Hideaki TANAKA¹, Nicolas ROUHIER², Genji KURISU¹ (¹Osaka University, Japan; ²Université de Lorraine, France)

X-ray crystallography of mitochondrial protein Adrenodoxin: toward the creation of hydrogen-evolving green algae

[P12-7] Tatsuro Futaki¹, Yasuyuki Watanabe¹, Yasuhiko Nishimura² (¹Suwa University of Science, Japan; ²Electric Power Development Co., Ltd)

Microalgae oil producing using organic photovoltaics

[P12-8] Natsuko Inoue-Kashino¹, Kentaro Ifuku², Yasuhiro Kashino¹ (¹Graduate School of Science, University of Hyogo, Japan; ²Graduate School of Agriculture, Kyoto University)

Microbubble-assisted recovery of high-value added metabolites without harvesting algal cells after large-scale cultivation

[P12-9] Koki Takagi¹, Yuka Kusunoki¹, Daisuke Takagi², Sophie A. Meredith³, Ashley M. Hancock³, Stephen D. Evans³, Peter G. Adams³, Kenichi Morigaki^{1,4} (¹Graduate School of Agricultural Science, Kobe University, Japan; ²Faculty of Agriculture, Setsunan University, Japan, ³School of Physics and Astronomy, University of Leeds, UK; ⁴Biosignal Research Center, Kobe University, Japan)

Reconstitution of thylakoid membrane in a patterned polymeric lipid bilayer scaffold [O12-1]

[P12-10] David Kaftan^{1,2}, David Bina¹, Tomáš Fessl¹, Guy Michel Wolf¹, Jakub Ködel¹, Martin Baroch^{3,4}, Juraj Dian^{3,4}, Jakub Pšenčík⁴, J. Thomas Beatty⁵, Roman Tůma¹ (¹Faculty of Science, University of South Bohemia, Czechia; ²Institute of Microbiology, Centre Algatech, Czechia; ³Faculty of Science, Charles University, Czechia; ⁴Faculty of Mathematics and Physics, Charles University, Czechia; ⁵Biodiversity Research Centre, The University of British Columbia, Canada)

Photochemical energy conversion nanodevice based on P22 bacteriophage self-assembling nanocontainer encapsulating RC-LH1 and cyt *c*

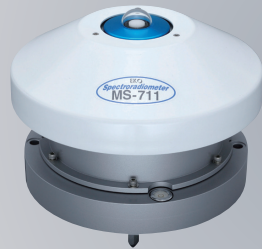
[P12-11] Toto Okada, Tomoharu Tanii, Toshihiko Eki, Yuu Hirose (Toyohshi Tech. Japan)
Analysis of fatty acid composition of the haptophyte *Dicrateria rotunda*



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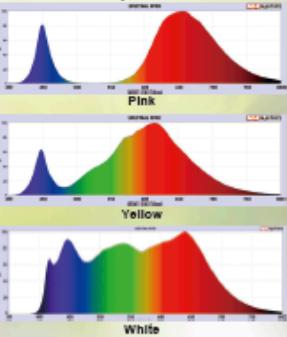
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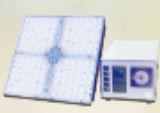
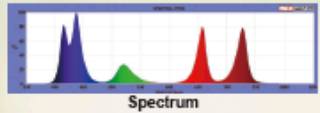



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