

ISC 2023 Toyama Scientific Program

	7/9 (Sun)		7/10 (Mon)		7/11 (Tue)		7/12 (Wed)		7/13 (Thu)		7/14 (Fri)		
8			OPENING, ICS AWARD CEREMONY* 8:00-9:00				ICS General Meeting* 8:30-8:45						8
9			Plenary Lecture* 9:00-9:45 by N. Misawa		Plenary Lectures* 8:30-10:00 by X.-D. Wang & J.-R. Shen		Plenary Lecture* 8:45-9:30 by B. Robert		Plenary Lectures* 8:30-10:00 by P. Fraser & S. Al-babili		Plenary Lectures* 8:30-10:00 by J. von Lintig & E. Johnson		9
			Coffee Break				Coffee Break						
10			SESSION 1* Genetics, Biosynthesis and Metabolism		SESSION 2** New Trends of Carotenoid Science		SESSION 4* Photochemistry Photophysics and Photosynthesis		SESSION 5** Chronic Disease Prevention and Treatment		Awards, Poster Awards and Presentations and Closing Ceremony* 10:30-12:00		10
11							Special Lecture* 10:45-11:30 by R. Cogdell		SESSION 8* Plant Carotenoids		SESSION 9** Food, Nutrition and Epidemiology		11
12			LUNCHEON SEMINAR - I** 12:15-13:45 Sponsored by Fuji Chemical Industries Co., Ltd.		LUNCHEON SEMINAR - II** 12:30-14:00 Sponsored by BASF SE		LUNCHEON SEMINAR - III** 11:30-13:00 Sponsored by Abbott Nutrition		LUNCHEON SEMINAR - IV** 12:30-14:00 Sponsored by DSM Nutritional Products				12
13													13
14			SESSION 3* Astaxanthin Symposium (incl. Plenary Lecture by Y. Naito) 13:45-16:15		SESSION 6* Carotenoid Metabolism and Function		SESSION 7** Chemistry and Analysis		SESSION 10* Carotenoids in the Eye and Brain		SESSION 11** Biotechnology and Industrial Production		14
15							EXCURSION 13:00-18:00						15
16	RECEPTION 14:00-	Young Investigator Forum** 15:00-18:00			GROUP PHOTO 16:00-16:30								16
17			POSTER SESSION / MIXER*** 16:15-18:00		POSTER SESSION / MIXER*** 16:30-18:00				POSTER SESSION / MIXER*** 16:00-18:00				17
18			SUN-SET SEMINAR - I** 18:00-19:30 Sponsored by OmniActive Health Technologies, Inc.										18
19	WELCOME MIXER*** 18:30-20:30				ICS Council Meeting & Dinner# 18:00-21:00		BANQUET# 18:30-20:30						19
20													20

* 3F Main Hall

** 2F Satellite Hall

*** 1F Gallery

ANA Crowne Plaza Hotel Toyama

SYMPOSIUM PROGRAM

Sunday 9th July

14:00 ~ Reception

15:00~18:00 Young Investigator Forum

18:30 ~ 20:30 Welcome Mixer (Gallery)

Monday 10th July

8:00 ~ 9:00 Opening, ICS Award Ceremony (Main Hall)

Plenary Lecture (Main Hall)

Session1: Genetics, Biosynthesis and Metabolism

~In memory of Prof. Brian H. Davies~

Chair: Gerhard Sandmann (Germany)

9:00 ~ 9:45 1P

Norihiko Misawa (Japan)

E. coli as the tool of functional analysis for carotenogenic genes

9:45 ~ 10:15 Coffee break

Parallel Sessions 1 & 2

Session1: Genetics, Biosynthesis and Metabolism

~In memory of Prof. Brian H. Davies~ (Main Hall)

Chair: Norihiko Misawa (Japan)

10:15 ~ 10:30 Prof. Norihiko Misawa: A lifetime of carotenoid excellence and achievements

Paul Fraser & Gerhard Sandmann

10:30 ~ 10:50 1I-1

Lourdes Gomez-Gomez (Spain)

Crocins in plants: much more beyond saffron

10:50 ~ 11:10 1I-2

Matsubara Shizue (Germany)

Carotenoid turnover in leaves studied by ¹³CO₂ labeling and LC-MS

- 11:10 ~ 11:30 1I-3
Torbert Rocheford (USA)
 Biofortification breeding for higher levels of macular carotenoids and provitamin A carotenoids in maize grain: An Update
- 11:30 ~ 11:45 1O-1
Susanne Baldermann (Germany)
 Metabolic responses and regulation of carotenoid and flavonoid biosynthetic pathways in lettuce (*Lactuca sativa*) in protected cultivation
- 11:45 ~ 12:00 1O-2
Li Li (USA)
 A novel regulatory mechanism to synchronize photosynthetic pigment synthesis in plants
- 12:00 ~ 12:15 1O-3
Maria J. Rodrigo (Spain)
 Color diversity in fruits of ancestral *Citrus* species: A comparative study of carotenoid metabolism during maturation

Session 2: New Trends of Carotenoids Science

(Satellite Hall)

Chair: Bruno Robert (France)

- 10:15 ~ 10:35 2I-1
John Erdman (USA)
 Is lutein ready for public health dietary recommendations?
- 10:35 ~ 10:55 2I-2
Laurent Dufossé (France)
 So many international symposia on carotenoids (19!!), so few industrially produced carotenoids... What are the problems?
- 10:55 ~ 11:15 2I-3
Manuel Rodriguez-Concepcion (Spain)
 Novel approaches to produce and store carotenoids in plant cells
- 11:15 ~ 11:35 2I-4
Sherry Tanumihardjo (USA)
 Bioefficacy of nixtamalized high β -cryptoxanthin biofortified maize and a novel β -cryptoxanthin supplement
- 11:35 ~ 11:50 2O-1
Daisuke Umeno (Japan)
 Breaking symmetry: laboratory evolution of carotenoid pathways to explore extra-natural space of carotenoid functions

11:50 ~ 12:05 2O-2

Sangho Koo (Korea)

Conductance control in the carotenoid molecular wires by phenyl substituents

12:15 ~ 13:45 Luncheon Seminar

Sponsored by Fuji Chemical Industries Co., Ltd. (Satellite Hall)

“Measuring Health: Future Considerations for Nutrition Research”

Panelists:

Jennifer Lovejoy (Translational Science at the Institute for Systems Biology (ISB), USA)

Suzan Wopereis (TNO, Netherland)

John Nolan (Nutrition Research Centre Ireland (NRCI), Ireland)

Vincent Wood (AstaReal Pte. Ltd., Singapore (Modertor))

Karen Hecht (AstaReal Inc., USA (Modertor))

Session 3: Astaxanthin Symposium

(Main Hall)

Chair: Takashi Maoka (Japan)

13:45 ~ 14:30 3P

Yuji Naito (Japan)

Interventions against gut frailty lead to healthy longevity

Chair: Yuji Naito (Japan)

14:35 ~ 14:55 3I-1

Allah Nawaz (USA)

Astaxanthin treatment improves endurance and ameliorates insulin resistance in the muscle of obese mice.

14:55 ~ 15:15 3I-2

Wataru Aoi (Japan)

The potential role of astaxanthin in metabolic health and exercise performance

15:15 ~ 15:35 3I-3

Mark Miller (USA)

Why is astaxanthin a perfect dietary supplement?

15:35 ~ 15:55 3I-4

Takashi Maoka (Japan)

Astaxanthin: Discovery, history, and distribution in nature

15:55 ~ 16:10 3O-1

Caroline Autenrieth (Germany)

A new modular expression platform for the high-level production of hydroxy- or ketocarotenoids in the purple photosynthetic bacterium *R. rubrum*

16:15 ~ 18:00 Poster session & Mixer (Gallery)

18:00 ~ 19:30 Sunset seminar

Sponsored by OmniActive Health Technologies, Inc. (Satellite Hall)

“Macular Carotenoids and the Eye-Brain Connection: A Panel Discussion on the Evolving Basic Science, Clinical Translation and Product Innovation Landscapes”

Panelists:

Paul Bernstein (University of Utah, USA)

Rudarani Banik (Ichan School Medicine, USA)

Dan Stein (Bausch & Lomb, Canada)

Deshanie Rai (OmniActive Health Technologies, USA (Moderator))

Tuesday 11th July

Plenary Lectures (Main Hall)

Session 5: Chronic Disease Prevention and Treatment

Chair: Jaume Amengual (USA)

8:30 ~ 9:15 5P

Xiang-Dong Wang (USA)

Mechanistic understanding of carotenoid benefits against chronic diseases

Session 4: Photochemistry, Photophysics and Photosynthesis

~In memory of Prof. Yasushi Koyama~

Chair: Hideki Hashimoto (Japan)

9:15 ~ 10:00 4P

Jian-Ren Shen (Japan)

Binding patterns and functions of fucoxanthin and related pigments in photosynthesis

10:00 ~ 10:30 Coffee break

Parallel Sessions 4 & 5

Session 4: Photochemistry, Photophysics and Photosynthesis

~In memory of Prof. Yasushi Koyama~

(Main Hall)

Chair: Hideki Hashimoto (Japan)

10:30 ~ 10:50 4I-1

Tomáš Polívka (Czech Republic)

Relation between carotenoid structure and spectroscopy: Implications for function of carotenoids in photosynthesis

10:50 ~ 11:10 4I-2

Daisuke Kosumi (Japan)

Photophysics in natural and artificial carbonyl carotenoids

11:10 ~ 11:30 4I-3

Jian-Ping Zhang (China)

Chlorophyll excitation quenching dynamics of the light harvesting complex II from the marine green alga *Bryopsis corticulans*

- 11:30 ~ 11:45 4O-1
Constantinos Varotsis (Cyprus)
Probing the fucoxanthin-chlorophyll *a/c*-binding proteins (FCPs) of the marine diatom *Fragilariopsis sp* by resonance Raman, FTIR, and fluorescence spectroscopy
- 11:45 ~ 12:00 4O-2
Vaclav Sebelik (Czech Republic)
Radical cation formation during the two-photon excitation of β -Apo-8'-carotenal
- 12:00 ~ 12:15 4O-3
Soichiro Seki (Japan)
Structures of siphonaxanthin and its acyl ester in marine green algal light-harvesting complex II
- 12:15 ~ 12:30 4O-4
Valentyna Kuznetsova (Czech Republic)
New insights into carotenoids higher electronic states dynamics

Session 5: Chronic Disease Prevention and Treatment

(Satellite Hall)

Chair: Xiang-Don Wang (USA)

- 10:30 ~ 10:50 5I-1
Jaume Amengual (USA)
Tissue-specific expression of BCO1 and its implication in cardiometabolic disease
- 10:50 ~ 11:10 5I-2
Tatsuya Sugawara (Japan)
Potential of siphonaxanthin for disease control and prevention
- 11:10 ~ 11:30 5I-3
M. Luisa Bonet (Spain)
Early-life metabolic programming by micronutrients and food bioactives with special focus on preformed vitamin A and beta-carotene: insights from murine models
- 11:30 ~ 11:45 5O-1
Yoav Sharoni (Israel)
Mechanisms involved in the protective effect of carotenoids and estradiol in human skin cells under mitochondrial oxidative stress

11:45 ~ 12:00 5O-2
Nicole Stringham (USA)
Lutein, zeaxanthin, and meso-zeaxanthin supplementation attenuates markers of systemic inflammation and oxidative cardiovascular processes

12:00 ~ 12:15 5O-3
Hoyoku Nishino (Japan)
Carotenoids as health promoting natural gifts

12:15 ~ 12:30 5O-4
Marina Green (Ireland)
Targeted nutrition with xanthophyll carotenoids and reduced cardiometabolic risk: A randomised double-blind placebo-controlled study

12:30 ~ 14:00 Luncheon Seminar

Sponsored by BASF SE (Satellite Hall)

“Why and how to fortify with carotenoids?”

Panelists:

Ute Obermueller-Jevic (BASF SE, Germany)

Wolf Pelletier (BASF SE, Germany)

Cosima Hirschberg (BASF A/S, Denmark)

Christian Koepsel (BASF SE, Germany)

Parallel Sessions 6 & 7

Session6: Carotenoid Metabolism and Function

(Main Hall)

Chair: Johannes von Lintig (USA)

14:00 ~ 14:20 6I-1
Loredana Quadro (USA)
Mechanisms of carotenoid transport across the maternal-fetal barrier

14:20 ~ 14:40 6I-2
T. Michael Redmond (USA)
Structural and functional role of cysteine palmitoylation in mammalian carotenoid cleavage dioxygenases

14:40 ~ 15:00 6I-3
Philip Kiser (USA)
Structure-function studies of a carotenoid isomeroxygenase reveal mechanistic diversity in the synthesis of 11-*cis*-retinoids for animal vision

- 15:00 ~ 15:20 6I-4
Jessica Cooperstone (USA)
Integrating multi-omics techniques towards understanding metabolism and the health effects of carotenoids
- 15:20 ~ 15:35 6O-1
Naoki Takatani (Japan)
Identification and tissue distribution of fucoxanthin-derived novel metabolites
- 15:35 ~ 15:50 6O-2
Anthony Miller (USA)
Exploring the role of HDL in carotenoid efflux and delivery to tissues

Session 7: Chemistry and Analysis

~In memory of Prof. Takao Matsuno, Prof. Synnøve Liaaen Jensen and
Prof. Kurt Bernhard~

(Satellite Hall)

Chair: Richard Sliwka (Norway)

- 14:00 ~ 14:20 7I-1
Takashi Maoka (Japan)
My chemical and biochemical studies of natural carotenoids during 45 years
- 14:20 ~ 14:40 7I-2
Daniele Giuffrida (Italy)
Apocarotenoids determination in Capsicum species and biological fluids by supercritical fluid extraction-supercritical fluid chromatography-triple quadrupole/mass spectrometry
- 14:40 ~ 15:00 7I-3
Kazutoshi Shindo (Japan)
Structural analyses of the compounds produced by acidic treatment of epoxy-carotenoids (violaxanthin, 9-*cis*-violaxanthin, antheraxanthin, and 9-*cis*-antheraxanthin), and the antioxidant activities of epoxy-carotenoids and the acid treatment products.
- 15:00 ~ 15:15 7O-1
Sangho Koo (Korea)
Rapid assembly of carotenoids of phenyl, phenolic, and acyl end groups with superior antioxidant activities

15:15 ~ 15:30 7O-2
Ryuju Suzuki (Japan)
Analysis of optical properties of carotenoid nanoparticles by considering molecular softness

15:30 ~ 15:45 7O-3
Veronika Nagy (Hungary)
Effect of the aggregation behaviour on the antioxidant capacity of carotenoids

15:45 ~ 16:00 7O-4
A. Ligia Focsan (USA)
Chemistry of carotenoid radicals and complexes: A compilation of tens of years of research

16:00 ~ 16:30 Group Photo

16:30 ~ 18:00 Poster session & Mixer (Gallery)

18:00 ~ 21:00 ICS Council Meeting & Dinner (ANA Crowne Plaza Hotel Toyama)

Wednesday 12th July

8:30 ~ 8:45 ICS General Meeting (Main Hall)

Plenary Lecture (Main Hall)

Session 2: New Trends of Carotenoid Science

Chair: Richard J. Cogdell (UK)

8:45 ~ 9:30 2P

Bruno Robert (France)

Carotenoids: the plant toolbox

9:30 ~ 10:00 Coffee break

Plenary Lecture (Main Hall)

Session 7: Chemistry and Analysis

~In memory of Prof. Matsuno Takao, Prof. Synnøve Liaaen Jensen and
Prof. Kurt Bernhard~

Chair: Kazutoshi Shindo (Japan)

10:00 ~ 10:45 7P

Richard Sliwka (Norway)

Carotenoids – an account of arbitrary exclusion and subjective inclusion

Special Lecture (Main Hall)

Chair: Hideki Hashimoto (Japan)

10:45 ~ 11:30 SL

Richard J. Cogdell (UK)

Carotenoids in photosynthesis: unlikely molecules?

11:30 ~ 13:00 Luncheon Seminar

Sponsored by Abbott Nutrition (Satellite Hall)

“Lutein as a modulator of oxidative stress: implications to health and disease”

Panelist:

Elizabeth J. Johnson (Tufts University, USA)

13:00 ~ 18:00 Excursion

18:30 ~ 20:00 Banquet (ANA Crowne Plaza Hotel Toyama)

Thursday 13th July

Plenary Lectures (Main Hall)

Session 11: Biotechnology and Industrial Production ~In memory of Prof. Chengfu Zhu~

Chair: Norihiko Misawa (Japan)

8:30 ~ 9:15 11P

Paul Fraser (UK)

Plant cell factories for industrial and nutritional carotenoids

Session 8: Plant Carotenoids

Chair: Giuliano Casaccia (Italy)

9:15 ~ 10:00 8P

Salim Al-babili (Saudi Arabia)

Plant apocarotenoid formation: destruction for construction

10:00 ~ 10:30 Coffee break

Parallel Sessions 8 & 9

Session 8: Plant Carotenoids

(Main Hall)

Chair: Salim Al-babili (Saudi Arabia)

10:30 ~ 10:50 8I-1

Claudia Stange (Chile)

Illuminating carotenoid synthesis regulation in the carrot taproot grown underground

10:50 ~ 11:10 8I-2

Giovanni Giuliano (Italy)

Dissection of the saffron crocin biosynthesis pathway and its biotechnological applications

11:10 ~ 11:30 8I-3

Patricia Leon Mejia (Mexico)

Carotenoid derived signals and their impact in plant development

11:30 ~ 11:50 8I-4

Barry Pogson (Australia)

Carotenoids, apocarotenoid signals and plant development

11:50 ~ 12:05 8O-1

Alen Albreht (Slovenia)

Using renewable sources of xanthophylls to produce xanthophyll esters with improved physicochemical properties in a sustainable manner

Session 9: Food, Nutrition and Epidemiology

(Satellite Hall)

Chair: Sussanne Bolderman (Germany)

10:30 ~ 10:50 9I-1

Antonio J. Meléndez-Martínez (Spain)

Increasing the bioaccessibility of carotenoids by cooking practices.
Sustainability aspects

10:50 ~ 11:10 9I-2

Torsten Bohn (Luxembourg)

Dietary-derived factors influencing aspects of carotenoid bioavailability –
focus on protein-interactions

11:10 ~ 11:30 9I-3

Volker Böhm (Germany)

Photoprotection with food rich in carotenoids

11:30 ~ 11:45 9O-1

Masashi Morifuji (Japan)

Fermented milk containing high content of exopolysaccharide enhance
dietary carotenoid bioavailability in humans.

11:45 ~ 12:00 9O-2

Naomi Fitzpatrick (Australia)

Validation of dietary lutein and zeaxanthin screeners in healthy Australian
adults

12:00 ~ 12:15 9O-3

Mohammed Iddir (Luxembourg)

Whey- and soy protein isolates added to a carrot-tomato juice alter
carotenoid bioavailability in healthy adults

12:30 ~ 14:00 Luncheon Seminar

Sponsored by DSM Nutritional Products (Satellite Hall)

“Importance of Lutein throughout life stages”

Panelists:

Paul Bernstein (University of Utah, USA)

Lisa Renzi (University of Georgia, USA)

Christian Schaefer (DSM, Switzerland)

Parallel Sessions 10 & 11

Session 10: Carotenoids in the Eye and Brain

(Main Hall)

Chair: Elizabeth Johnson (USA)

14:00 ~ 14:20 10I-1

Akira Obana (Japan)

Application of the measurement of skin carotenoids by refractive spectroscopy, Veggie Meter.

14:20 ~ 14:40 10I-2

Billy Hammond (USA)

Functional effects of macular pigment density on the central nervous system

14:40 ~ 15:00 10I-3

Matthew Toomey (USA)

The mechanisms and meaning of ketocarotenoid-based signals in animals

15:00 ~ 15:20 10I-4

John Nolan (Ireland)

Macular carotenoids: Keeping an eye on vision and beyond!

15:20 ~ 15:40 10I-5

Paul Bernstein (USA)

Noninvasive screening for vitamin A deficiency in high-risk populations using skin carotenoid measurements

15:40 ~ 15:55 10O-1

Ana Maria Rodriguez Guerrero (Spain)

Brain regulation of gene expression by β -carotene and metformin: possible role in the control of energy metabolism and cognitive function

Session 11: Biotechnology and Industrial Production ~In memory of Prof. Chengfu Zhu~

(Satellite Hall)

Chair: Paul Fraser (UK)

14:00 ~ 14:20 11I-1

Briardo Llorente (Australia)

Multi-subcellular engineering for carotenoid production

14:20 ~ 14:40 11I-2

Daichi Kuwahara (Japan)

Industrial production of carotenoids using *Paraococcus carotinifaciens* and carotenoid applications for animal feed

- 14:40 ~ 15:00 11I-3
Gerhard Sandmann (Germany)
Metabolic engineering of *Xanthophyllomyces dendrorhous* for the production of commercially interesting carotenoids and the generation of novel structures
- 15:00 ~ 15:20 11I-4
Tomohisa Hasunuma (Japan)
Dynamic metabolomics approach and engineering biology for microbial carotenoid production
- 15:20 ~ 15:35 11O-1
Paola Ferrante (Italy)
Nicotiana benthamiana as a cell factory for high value-added (apo)carotenoids
- 15:35 ~ 15:50 11O-2
Nadja-Alina Henke (Germany)
Perturbing native gene expression with a CRISPRi-library and application of a genetically encoded biosensor to study carotenogenesis
- 15:50 ~ 16:05 11O-3
Maiko Furubayashi (Japan)
Engineering novel retinal-related compounds through carotenoid pathway engineering and enzyme mutagenesis

16:10 ~ 18:00 Poster session & Mixer (Gallery)

Friday 14th July

Plenary Lectures (Main Hall)

Session 6: Carotenoid Metabolism and Function

Chair: Loredana Quadro (USA)

8:30 ~ 9:15 6P

Johannes von Lintig (USA)

Molecular components affecting carotenoid homeostasis in mammalian cells and tissues

Session 10: Carotenoids in the Eye and Brain

Chair: Paul Bernstein (USA)

9:15 ~ 10:00 10P

Elizabeth Johnson (USA)

Lutein and cognitive function throughout the lifespan: an update.

10:00 ~ 10:30 Coffee break

10:30 ~ 12:00 Awards, Poster Awards and Presentations and Closing Ceremony

LIST OF POSTER PRESENTATIONS

P1-1

Torres-Montilla Salvador, Morelli Luca, Bombarely Aureliano

Transcriptional changes associated to the chloroplast-to-chromoplast transition in carotenoid-overaccumulating leaves.

P1-2

Nagashima Aya, Ishihara Daichi, Araki Yui, Ando Hiroto, Miki Tashiro, Takumi Ojima, Daisuke Umeno

Promiscuous carotenoid pathways as indicators for intercellular proportion of IPP and DMAPP

P1-3

Araki Yui, Ojima Takumi, Ando Hiroto, Umeno Daisuke

Molecular breeding of C₂₀ carotenoid pathways

P1-4

Ishihara Daichi, Onozato Yumi, Minakata Katsuya, Iwasaki Miki, Kawai-noma Shigeiko, Umeno Daisuke

Directed evolution of high-titer non-mevalonate pathway

P1-5

Ando Hiroto, Ojima Takumi, Umeno Daisuke

Converting squalene synthase into carotenoid synthase for biosynthesis of minisqualene

P1-6

Rodrigo Maria J., Rey Florencia, Lozano-Omeñaca Aurora, Zacarias Lorenzo

Carotenoid metabolism during fruit maturation of Nadorcott, a highly pigmented mandarin

P1-7

Tamaki Shun, Nomura Toshihisa, Ishikawa Marumi, Yamada Koji, Suzuki Kengo, Mochida Keiichi

Pathway-scale genome editing provides a comprehensive understanding of carotenoid biosynthesis in microalga *Euglena gracilis*

P1-8

Seki Soichiro, Yamano Yumiko, Oka Naohiro, Kamei Yasuhiro, Fujii Ritsuko

Blue-to-green light regulates siphonaxanthin biosynthesis: Discovery of deoxysiphonaxanthin in an edible macrogreen alga, *Codium fragile*

P1-9

Sugiyama Kenjiro, Takaichi Shinichi

Two types of lycopene cyclases in cyanobacteria: CruA/CruP-type and CrtL-type (Overview)

P1-10

Nayak Jwalit J., Cazzonelli Christopher I.

Light-mediated isomerisation of acyclic *cis*-carotenes regulates metabolic feedback and nuclear gene expression in Arabidopsis.

P1-11

Zheng Hui, Rodriguez-Concepcion Manuel, Lu Shan

Transient overexpression of STAY-GREEN causes the formation of chromoplasts in dark-incubated leaves

P2-2

Polyakov Nikolay E., Focsan A. Ligia, Gao Yunlong, Kispert Lowell, D.

Supramolecular delivery systems for carotenoids: EPR and optical studies

P2-3

Pervin Mahfuza, Brenya Eric, Johnson Scott, Cazzonelli Christopher I.

Mechanical stimulation contra-regulates carotenoid and ABA biosynthesis in leaves from naïve versus touch-acclimated *Arabidopsis* plants

P3-1

Schmitt Ina, Meyer Florian, Henke Nadja A., Peters-Wendisch Petra, Kousoulaki Katherina, Zeytin-Schüning Sinem, Alberts-Hubatsch Hilke, Wendisch Volker F.

From aquaculture to aquaculture: Production of the fish feed additive astaxanthin and other valuable carotenoids from aquaculture sidestream by *Corynebacterium glutamicum*

P4-1

Miki Bando-Uotani, Vasco Joris, Yujiro Hama, Kyoko Shinzawa-Itoh, Natsuko Inoue-Kashino, Yasuhiro Kashino, Keisuke Kawakami, Koji Yonekura and Daisuke Kosumi

Excitation energy transfer dynamics of carotenoids in the far-red light utilizing photosystem II from *Acaryochloris marina*

P4-2

Nohara Taiki, Bando-Uotani Miki, Serikawa Hiroki, Kawakami Keisuke, Yonekura Koji, Kamiya Nobuo, Kosumi Daisuke

Photosynthetic functions of carotenoids in photosystem I from cyanobacteria, as revealed by ultrafast spectroscopy

P4-3

Hama Yujiro, Kosumi Daisuke

Real-time observation of molecular vibrations of fucoxanthin by 10 fs pump-probe spectroscopic measurement

P4-4

Yamamoto Hayata, Kida Masatoshi, Kawakami Keisuke, Uchida Hiroko, Murakami Akio, Kamiya Nobuo, Kosumi Daisuke

Ultrafast energy transfer dynamics in photosynthetic antenna acpPC from dinoflagellate *Symbiodinium*

P4-5

Papageorgiou Marios, Tselios Charalampos, Varotsis Constantinos, Pinakoulaki Eftychia

Photoreduction of carotenoids and binding dynamics of the tetraheme-RC-bound cytochromes *c* and cytochrome *c*₂ in *Roseobacter denitrificans* probed by resonance Raman spectroscopy

P4-6

Kawakami Keisuke, Hamaguchi Tasuku, Shinzawa-Itoh Kyoko, Inoue-Kashino Natsuko, Kashino Yasuhiro, Yonekura Koji

Identification of carotenoids in photosynthetic protein complexes based on structural analysis

P4-7

Kojima Risa, Kida Masatoshi, Kosumi Daisuke, Oh-Oka Hirozo

Analysis of the excited energy transfer from 4,4'-diaponeurosporene to bacteriochlorophyll-*g* in the photosynthetic reaction center of *Heliomicrobium modesticaldum*

P4-8

Sei Ryuya, Horiuchi Kota, Uragami Chiasa, Hashimoto Hideki

Temperature-dependent absorption spectra of carotenoids exploring the relationship between solvent-carotenoid interaction and 0-0 band width

P4-9

Kishida Ikuya, Uragami Chiasa, Hashimoto Hideki, Cogdell Richard

Photoprotective function evaluation of light-harvesting systems containing bacteriochlorophyll *b* in *Blastochloris viridis*

P4-10

Tao Ruohan, Yumeka Kakuta, Chiasa Uragami, Hideki Hashimoto

Decoding the molecular structures and functions of carotenoid radical species using resonance Raman spectroscopy and DFT calculations

P4-11

Mitani Koki, Uragami Chiasa, Yukihiro Nao, Gardiner Alastair, Richard J. Cogdell and Hideki Hashimoto

Triplet-triplet-type photoprotective pathway in the spheroidene-reconstituted LH1 complex

P4-12

Echigo Mayu, Kota Horiuchi, Chiasa Uragami, Hideki Hashimoto

Exploring the structure-function relationship of β -apo-8'-carotenal isomers: Insights into photosynthetic pigments from computational chemistry analysis

P4-13

Morita Yuya, Uragami Chiasa, Hashimoto Hideki

Replication of absorption spectrum of carotenoid in purple photosynthetic bacteria

P4-14

Sago Yuma, Horiuchi Kota, Uragami Chiasa, Hashimoto Hideki

Exploring the excited state properties of β -apo-8'-carotenal through steady-state fluorescence spectroscopy

P4-15

Horiuchi Kota, Uragami Chiasa, Ruohan Tao, Kosumi Daisuke, J. Cogdell Richard, Hashimoto Hideki

Excited-state dynamics of *cis* isomers of β -apo-8'-carotenal: Classification of rate constants and "inverse energy gap law"

P4-16

Yamano Nami, Wang Peng, Zhang Jian-Ping

Application of lipid-nanodisc to investigate the photoprotective function of carotenoids bound to photosynthetic light harvesting complex

P4-17

Yoshida Kazuhiro, Seki Soichiro, Yamano Yumiko, Fujii Ritsuko

Analysis of ICT state with fluorescence at low-temperature

P5-2

Lee Jung Hyeun, Kim Yuri, Heo Seung Chul

Anticancer effect of β -carotene in oxaliplatin-resistant colon cancer cell by regulating apoptosis and cancer stemness

P5-3

Yeonsoo Oh, Hyeonju Yu, Kwang Ko, Yuri Kim

An integrative transcriptomic analysis reveals the potential benefits of carotenoid for cancer therapy in female patients with colorectal cancer

P5-4

Ribot Joan, Stojnić Bojan, Palou Andreu, Diretto Gianfranco, Bonet M. Luisa

Effects of beta-carotene supplementation alone and in combination with metformin on tissue lipidomic profiling after high-fat diet feeding in mice

P5-5

Ashino Hiromi, Yanai Yu, Sadamatsu Hisato, Mukai Katsuyuki, Oka K., Yao S., Nakajima Hiroshi, Iwase Katsuro

Suppressive effects of fucoxanthin derived from a diatom, *Chaetoceros sp.*, on angiogenesis

P5-6

Kwon Hyeji, Han Hyejin, Oh Yeonsoo, Kim Yuri, Kim Junghyun

Anti-cancer effects of low-intensity exercise and genistein supplementation

P6-1

Ikeda Chiaki, Manabe Yuki, Nami Tomonaga, Wada Tatsuya, Maoka Takashi, Sugawara Tatsuya

Evaluation of inhibitory effect of halocynthiaxanthin on differentiation into pro-inflammatory macrophages and its gastrointestinal absorption

P6-2

Betekhtin Alexander, Sala Katarzyna, Perez-Perez Renee, Kwasniewska Jolanta

Buckwheat calli with different morphogenic potential as a unique system to study levels of both carotenoids and phenolic compounds

P6-3

Bradley Madelyn, Hashida Megumi, Black Molly, Amengual Jaume, Erdman John

Interaction of dietary lycopene with the ISX/SRB1 axis

P6-4

Manabe Yuki, Maoka Takashi, Sugawara Tatsuya

Dehydrogenation increases anti-inflammatory activity of siphonaxanthin

P6-5

Göttl Vanessa L., Pucker Boas, Wendisch Volker F., Henke Nadja A.

Screening of structurally distinct lycopene β -cyclases for cyclic C40 carotenoid production of β -carotene and astaxanthin in *Corynebacterium glutamicum*

P6-6

Shukla Anushka, Bohn Torsten

Exploring the impact of dietary fibers on carotenoid bioaccessibility and bioavailability

P7-1

Giuffrida Daniele, Mertinez-Giron Jader, Osorio Coralia, Ordonez-Santos Luis Eduardo, Rigano Francesca, Cafarella Cinzia, Mondello Luigi

Peach palm fruit (*Bactris gasipaes*) peel as a source of Provitamin A carotenoids

P7-2

Ryo Asaka, Kazuki Ohshima, Shinji Kawasaki, Takashi Maoka, Chisato Tode, Zheng-Yu Wang-Otomo, Shinichi Takaichi

Major carotenoids of *meiothermus ruber* are deinoxanthin glucoside esters, not meiothermoxanthin glucoside esters

P7-3

Shinichi Takaichi

Identification protocol of carotenoids

P7-4

Focsan A. Ligia, Gao Yunlong, Polyakov Nikolay E., Kispert Lowell D.

Hydrogen bonding and nonpolar environment applications to some rare carotenoids

P7-5

Hoffmann Julian, Baldermann Susanne

Structural elucidation of β -carotene oxygen copolymers by complementary analytical method

P7-6

Línzembold Ildikó, Nagy Veronika, Agócs Attila, Deli József, Gulyás-Fekete Gergely

Synthesis of phenolic acids esters of carotenoids

P8-3

Molina-Márquez A., Hegemann P., Kelterborn S., Rengel R., Vigara J., León R.

Comparative assessment of Cas9/sgRNA ribonucleoprotein complexes and herbicide treatment for PDS knock-out in chlorophyte microalgae

P8-4

Homma Masato, Wakabayashi Takatoshi, Moriwaki Yoshitaka, Shiotani Nanami, Shigeta Takumi, Isobe Kazuki, Okazawa Atsushi, Ohta Daisaku, Terada Tohru, Shimizu Kentaro, Mizutani Masaharu, Takikawa Hirosato, Sugimoto Yukihiro

Stereoselective orobanchol biosynthesis catalyzed by dirigent domain containing protein in tomato

P8-5

Kwasniewska Jolanta, Betekhtin Alexander

Buckwheat - a unique plant system to improve carotene production by using mutagenesis

P8-6

Šimić Domagoj, Galić Vlatko, Jambrović Antun, Ledenčan Tatjana, Kljak Kristina, Buhiniček Ivica, Šarčević Hrvoje

Relations among carotenoids and vitamin E compounds in a diverse inbred line collection of temperate maize

P8-7

Takagi Tatsuyoshi, Hong Hung, Dillon Natalie, Alam Mobashwer, O'Hare Tim

Identification of candidate genes affecting mango flesh colour and validation through GWAS

P8-8

Kantoğlu K. Yaprak, İç Erhan, Özmen Dilan, Kantoğlu Ömer

Changes in carotenoid and tocopherol contents of cherry tomato lines improved by radiation induced mutation breeding

P8-9

Wakabayashi Takatoshi, Honma Masato, Takikawa Hirosato, Mizutani Masaharu, Sugimoto Yukihiro

Conversion of carlactonic acid to various strigolactones in plants

P8-10

Mladenov Petko, Planchon Sébastien, Leclercq Céline, Renaut Jenny, Tomlekova Nasya

Proteome profiling of sweet pepper genotypes (*Capsicum annuum L.*) with beneficial mutations

P8-11

Chen Nan, Wu Fan, Peng Yu, Wen Xin

Characterization of chromoplasts as natural food colorants and their stability under different storage conditions

P8-12

Boba Aleksandra, Kochneva Yelyzaveta, Kulma Anna

Role of apocarotenoids in the management of fusariosis in flax

P8-13

Agarwal Rimjhim, Hong Hung, Hayward Alice, Harper Steve, O'Hare Tim

Possible reasons for high zeaxanthin in orange capsicums

P8-14

Ningrum Andriati, Sarifudin Achmat, Kumalasari Rima, Ekafitri Riyanti, Kristanti Dita, Setiaboma Raima

In silico methodologies to improve antioxidant evaluation of carotenoids in soybean and protein hydrolysates from soybean dregs (Okara)

P8-15

Mizuno Khoki, Ariumi Masashi, Miura Kenji, Takeda Satomi

Modification of chloroplast pigment composition by overexpression of carotenoid biosynthesis enzyme genes

P8-16

Julie Leroux, Ryan P. McQuinn, Thuy T. Truong, Barry J. Pogson

Exploring mass spectrometry technologies to decipher metabolomic shifts during floral transition in *Arabidopsis thaliana*

P9-1

Pintea Adela, Muntean Patricia, Gherasim Cristina, Bunea Andrea, Dulf Francisc V., Rugina Dumitrita, Focsan Monica

Zeaxanthin loaded nanoemulsion systems – preparation, characterization and stability

P9-2

Rugină Dumitrita, Gherasim Cristina, Nistor Mădălina, Muntean Patricia, Coman Cristina, Pintea Adela

Bioaccessibility and cellular uptake of zeaxanthin from oil-in-water nanoemulsions

P9-3

Prado-Cabrero Alfonso, Nolan John M.

Low-tech production of astaxanthin-rich copepods: Towards a self-sustainable and decentralized food production system

P9-4

Shi Hao, Pryor Colette, Green Marina, Power Tommy, Nolan John, Prado-Cabrero Alfonso

Preparation, evaluation and bioavailability of a novel lutein-fortified yoghurt: Fortixan

P9-5

Flynn Róisín, Prado Cabrero Alfonso, Green Marina, Nolan John

β -carotene degradation in a sport isotonic beverage

P9-6

Maeshima Nozomi, Kobayashi Manami

Simultaneous determination of fat-soluble vitamins in beverages using a triple quadrupole mass spectrometer

P9-7

Schmidt Mario, Fehn Simon, Tauber Svenja, Hopfhauer Sofia, Schwarzenbolz Uwe, Böhm Volker

Impact of high pressure processing on lipophilic bioactive plant

P9-8

Lietz Georg, Oxley Anthony, Goddard Alice

Bioefficacy of β -cryptoxanthin in comparison to β -carotene using stable isotopes.

P10-1

Power Tommy, Prado Cabrero Alfonso, Oakley Donna, Nolan John

Assessment of dietary supplements containing lutein, zeaxanthin and meso-zeaxanthin and/or omega-3 fatty acids for compliance to label claim

P10-2

Li Binxing, Chang FU-Yen, Wan Zihe, Bernstein Paul S.

Imaging macular carotenoids and their related proteins in the human retina with confocal resonance Raman microscopy

P10-3

Fitzpatrick Naomi, Chachay Veronique, Shore Angela, Briskey David, Jackman Sarah, Capra Sandra, Bowtell Joanna

Is electronic device use related to macular pigment optical density, dietary and plasma lutein and zeaxanthin in healthy Australian adults?

P10-4

Sivaperuman Parimala, Gomez-Green Marina, Stringham James M., Roche Warren, Nolan John M.

An evaluation of xanthophyll carotenoids, visual function and sport performance in an athlete population

P10-5

Pap Ramóna, Pandur Edina, Jánosa Gergely, Horváth Adrienn, Sipos Katalin, Agócs Attila, Deli József

Lutein and its metabolites modulate inflammation, oxidative stress, and lipid peroxidation at glutamate-induced neurotoxicity

P10-6

Wysocky Cameron, Dandurand Jade, Hogan Cassidy, Beer Jenay, Hammond Billy, Renzi-Hammond Lisa

Xanthophylls as moderators of cognitive functional improvement during a 6-month cognitive training intervention in older persons at risk for Alzheimer's disease or a related dementia

P10-7

Addo Emmanuel Kofi, Susan Allman, Ranganathan Arunkumar, Joanna E. Gorka, Mohsen Sharifzadeh, Michael W. Varner, Paul S. Bernstein

Infant ocular and systemic effects of prenatal carotenoid supplementation in the lutein and zeaxanthin in pregnancy (L-ZIP) trial

P10-8

Arunkumar Ranganathan, Li Binxing, Addo Emmanuel, Chang Fu-Yen, Bernstein Paul

β , β -carotene-9',10'-oxygenase 2 (Bco2^{-/-}) mice are protected against oxygen-induced retinopathy (OIR) relative to wild-type (WT) mice

P11-1

González J, Rengel R, Molina-Marquez Ana, Morillo David, Vigara Javier, León Rosa

Carotenoid-rich microalgae extracts as antimicrobial agents against marine pathogens

P11-2

Chino Tomoki, Saito Yohei, Takemoto Kayo, Kawai-Noma Shigeko, Seki Takahiro, Saito Kyoichi, Umeno Daisuke

P11-3

Grassino Maria, Batstone Damien, Hulsen Tim

Resource recovery using mixed purple phototrophic bacteria for carotenoid production

P11-4

Parralejo-Sanz Sara, Lara-Abia Sara, Lobo Gloria, Cano M. Pilar

Formulation of a potential healthy ingredient using papaya carotenoid green extracts to improve carotenoids stability and bioaccessibility