

C50 CAROTENOIDS FROM THE CHEESE-RIPENING BACTERIA ARTHROBACTER ARILAITENSIS

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Daniele Giuffrida, Nuthathai Sutthiwong, Paola Dugo, Paola Donato, Francesco Cacciola, et al.. C50 CAROTENOIDS FROM THE CHEESE-RIPENING BACTERIA ARTHROBACTER ARILAITENSIS. 17th International Carotenoid Symposium, Jun 2014, Park City, Utah, United States. Poster communication, 17th International Carotenoid Symposium, Park City, Utah, USA, June 29 – July 4, 2014., 2014. hal-01396829

HAL Id: hal-01396829
https://hal.science/hal-01396829

Submitted on 15 Nov 2016

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C50 CAROTENOIDS FROM THE CHEESE-RIPENING BACTERIA *ARTHROBACTER ARILAITENSIS*

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[a]Università degli Studi di Messina, Dipartimento di Scienze dell'Ambiente, della Sicurezza, del Territorio, degli Alimenti e della Salute, Messina, Italy (Daniele Giuffrida, dgiuffrida@unime.it); [b]Université de La Réunion, ESIROI Agroalimentaire, LCSNSA, Saint-Denis, Reunion island, France ; [c]Università degli Studi di Messina, Dipartimento di Scienze del Farmaco e dei Prodotti per la Salute, Messina, Italy; [d]Università Campus Bio-Medico di Roma, Centro Integrato di Ricerca, Roma, Italy; [e]Chromaleont s.r.l. A start-up of the University of Messina, Italy.

Cheeses harbor a complex microbiota, usually a succession of different microorganisms during milk coagulation and ripening. Surface-ripened cheeses are characterized by a ripening from the cheese surface to the interior due to the activity of both yeasts and bacteria. Many such cheeses are produced all over the world with Europe as a leader: Taleggio in Italy; Munster, Epoisses, Livarot in France; Limburger, Tilsit in Germany; Herve in Belgium [1]. The cheese microflora contributes to a large extent to the development of the typical flavor, texture, and color of the final product. Color is one of the major attributes which affects the consumer perception of quality. Pigments generated by the smear bacteria at the surface of cheeses were poorly studied, exception made for those of the bacteria *Brevibacterium linens* (aromatic carotenoids, isorenieratene and hydroxyl derivatives). Indeed, for a long time this bacterium has been considered the single source of the color of red-smear ripened soft cheeses. High-throughput sequencing revolutionized the field of microbial ecology, allowing for a more accurate identification of microbial taxa, including those which are difficult to culture and/or are present in low abundance, now revealing the highly diverse bacterial populations of cheese rinds, i.e. with up to 19 bacterial genera described in some cheeses.



Arthrobacter bacteria have been isolated on surface-ripened cheeses and their pigments were found in cheese rinds [1]. The genus *Arthrobacter* is very complex in Nature with 80 species isolated from various environments and listed in the taxonomy, producing a great variety of pigments: orange and yellow (carotenoids –pioneering works in the early seventies [2]), blue and green (indigoidine, indochrome), red (porphyrins, carotenoids). The present study focuses on the chemical characterization of pigments biosynthesized by the cheese-ripening bacteria *Arthrobacter arilaitensis*.



Material and Methods

Lyophilized biomass was extracted with 3 x MeOH and 2 x MTBE, with sonication and centrifugation at each step. Samples were analyzed using the same solvent system (Solvent A: MeOH; Solvent B: MTBE) with the gradient conditions described in [1]. A fused core column Ascentis Express Supelco C18, (150 x 4.6 mm, particle size 2.7 mm) and a Shimadzu Nexera HPLC-PDA-IT TOF system were used for the HPLC analyses.

Results and Discussion

The UV-vis carotenoid profiles were similar for both strains investigated. Considering the UV-vis spectra (including fine structure), the APCI (-) and (+) mass spectra, and the elution order, 8 different carotenoids were tentatively identified.

Four of them (sarcinaxanthin mono-glucoside pentaacetate, decaprenoxanthin di-glucoside, decaprenoxanthin mono-glucoside and decaprenoxanthin-C16:0) are possibly present in very low amount, and were only detected in the APCI (-) ionization mode. The other four free main carotenoids, decaprenoxanthin, sarcinaxanthin, 9-*Z*-decaprenoxanthin and 15-*Z*- decaprenoxanthin have quite clearly been characterized by both their UV-vis spectra and MS spectra in APCI (-) and (+) ionization mode. *Arthrobacter arilaitensis* species does indeed produce C50 carotenoids, and in particular, it mainly produces free all-*E*-decaprenoxanthin, and in minor amount two of its *cis* isomers, the 9-*Z*-decaprenoxanthin and 15-*Z*- decaprenoxanthin.

Figure 1. Extracted ion chromatogram (APCI negative) at m/z 704, m/z 866, m/z 849 (1028-179), and 942, of the carotenoid extract of *Arthrobacter arilaitensis*. For tentative peaks identification see **Table 1**.

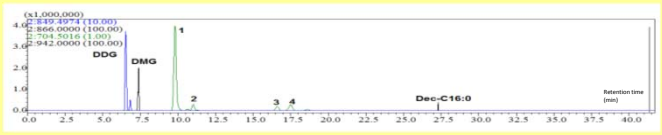
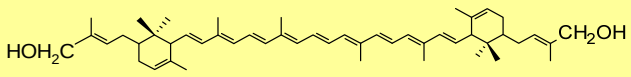


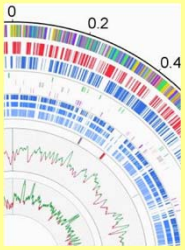
Table 1. UV-vis and MS APCI (-) and (+). Information and tentative identification of the carotenoid extract of *Arthrobacter arilaitensis*.

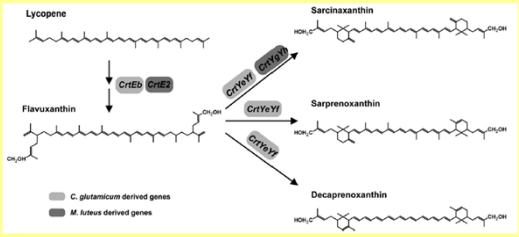
ID	Identification	UV-vis Maxima	MS data APCI(-)	MS data APCI (+)
SMG p RT 1.08 min	Sarcinaxanthin Mono-Glucoside pentaacetate	Not detected	1076	Not detected
RT 4.53 min	Not identified			
RT 4.97 min	Not identified			
DDG RT 6.53 min	Decaprenoxanthin Di-Glucoside	Not detected	1028, 849	Not detected
DMG RT 7.36 min	Decaprenoxanthin Mono-Glucoside	Not detected	866	Not detected
1 RT 9.79 min	Decaprenoxanthin	413, 437, 467	704	705, 689,687,669,595
2 RT 10.95 min	Sarcinaxanthin	415, 438, 466	704	705, 687, 551
3 RT 16.51 min	9-Z-Decaprenoxanthin	318, 409, 434, 461	704	705,687,669,549, 523
4 RT 17.41 min	15-Z-Decaprenoxanthin	320, 407,431,460	704	687, 669, 577
Dec-C16:0 RT 27.30 min	Decaprenoxanthin-C16:0	Not detected	942	Not detected



(2R,6R,2'R,6'R)-Decaprenoxanthin

This is in complete accordance with genomic data published about *A. arilaitensis* (whole genome sequencing [3]) and its Idi, CrtE, CrtB, CrtI, CrtEb, CrtYe and CrtYf carotenogenesis cluster, similar to the cluster of the decaprenoxanthin producing *Corynebacterium glutamicum*.





References

[1] P. Galaup, A. Gautier, Y. Piriou, A. de Villeblanche, A. Valla, and L. Dufossé. *Innov. Food Sci. Emerg. Technol.*, **8**, 373-378 (2007). [2] N. Arpin, S. Liaaen-Jensen, and M. Trouilloud. *Acta Chem. Scand.*, **26**, 2524-2526 (1972). [3] C. Monnet *et al. PLoS ONE*, **5**, e15489 (2010).



A Conference to Remember

The 17th International Carotenoid Symposium, being held in Park City, Utah from June 29 - July 4, is the triennial meeting of the International Carotenoid Society. This conference addresses the full spectrum of carotenoid biology and chemistry not only from "bench-to-bedside" but also from "microbes-to-mammals", bringing together the leading carotenoid researchers, young investigators, and students from academia, industry, and government for five days of intensive interactive presentations and discussions of the chemistry and physiology of carotenoids with particular emphasis on mechanisms of disease prevention from infancy to old age for these common constituents of the human diet and of widely consumed dietary supplements.

Come to Utah for ICS 2014!

The conference will be very family-friendly, so bring yours! See Excursions and Vacations to start planning a family vacation or learn about our pre and post conference trips. Start to preview the Conference Activities. There will be child care available, as well as many on-site activities for family members of all ages. Public transportation is available for activities all over Park City, including shopping both at Park City's Historic Main Street and a huge nearby designer outlet mall.

Registration is still open

Advance registration fees are $800 for attendees, this will be $1200 for on-site registration. Advance registration for students is $475, $800 for on-site student registration. Students, check out how to get your special registration rate on the Visa / Student Info page before going online to register.

Abe, Katsuya **For a** Poster	Composition and accumulation of free- and ester-carotenoids in the aerial microalga Scenedesmus sp. (Chlorophyceae) cultured under stress conditions.
Session:	**Scheduled for:**
Authors: Katsuya Abe Daichi Sumida Nobuhiro Aburai	

Aburai, Nobuhiro **For a** Poster	A new approach to carotenogenesis up-regulated using inhibitors of fatty acid biosynthesis in aerial microalgae.
Session:	**Scheduled for:**
Authors: Nobuhiro Aburai Katsuya Abe	

Agócs, Attila **For a** 15 minute talk	NEW METHODS IN THE SYNTHESIS OF CAROTENOID GLYCOSIDES
Session: Chemical Synthesis, Analysis, and Industrial Production I	**Scheduled for:** Tuesday, July 1
Authors: Agócs, A Hanaura, M. Deli, J. Nagy, V.	

Al-Babili, Salim **For a** 30 minute talk	Biosynthesis of Plant Carotenoid-Derived Signaling Molecules
Session: Biosynthesis and Metabolism II	**Scheduled for:** Thursday, July 3
Authors: Salim Al-Babili	

Amaya, Elkin **For a** 15 minute talk	THE ANTIOXIDANT ROLE OF CANTHAXANTHIN FOR CHICK DEVELOPMENT: OVERVIEW FROM PUBLISHED STUDIES WITH HENS
Session: Biosynthesis and Metabolism I	**Scheduled for:** Monday, June 30
Authors: AMAYA, E.	

Ambati, Ranga Rao **For a** Poster	THE PROTECTIVE ROLE OF ASTAXANTHIN AND ASTAXNTHIN ESTERS FROM GREEN MICROALGA-HAEMATOCOCCUS PLUVIALIS ON UV-DMBA INDUCED SKIN CARCINOGENSIS RATS: POSSIBLE MECHANISM OF ACTION
Session:	**Scheduled for:**
Authors: Ambati Ranga Rao H. N. Sindhuja Shylaja M. Darmesh Kadimi Udaya Sankar Ravi Sarada Gokare Aswathanarayana Ravishankar Phang Siew Moi	

Arathi, Bangalore **For a** 15 minute talk	UPLC-PDA AND TANDEM MASS SPECTRAL CHARACTERISTICS OF MAJOR LYCOPENE ISOMERS
Session: Chemical Synthesis, Analysis, and Industrial Production I	**Scheduled for:** Tuesday, July 1
Authors: Arathi, B.P. Sowmya, P.R. Dilshad, P. Saikat, B. Gopal, V. Lakshminarayana, R.	

Autenrieth, Caroline **For a** 15 minute talk	STRUCTURE-FUNCTION RELATIONSHIPS OF THE RHODOPIN 3,4-DESATURASE (CrtD) OF RHODOSPIRILLUM RUBRUM
Session: Biosynthesis and Metabolism II	**Scheduled for:** Thursday, July 3
Authors: Autenrieth, C. Ghosh, R.	

Bauerfeind, Jasmin **For a** Poster	Using photochemiluminescence to measure the lipophilic antioxidant capacities of carotenoid rich food products
Session:	**Scheduled for:**
Authors: Bauerfeind, J Hintze, V. Kschonsek, J. Killenberg, M. Böhm, V.	

Beck, Warren **For a** 30 minute talk	Nonradiative Decay Dynamics and Intramolecular Charge Transfer in Peridinin and The Peridinin Chlorophyll A Protein
Session: Photochemistry, Photophysics, and Photosynthesis I	**Scheduled for:** Monday, June 30
Authors: Ghosh, S. Roscioli, J. D. Bishop, M. M. Frank, H. A. Beck, W. F.	

Berendschot, Tos TJM **For a** 30 minute talk	Lutein and inflammation
Session: Carotenoids in the Eye I	**Scheduled for:** Monday, June 30
Authors: Berendschot TTJM Tian Y Kijlstra A	

Berendschot, Tos TJM **For a** Poster	The effect of a lutein-enriched egg-beverage on visual function in early age-related macular degeneration, a randomized trial
Session:	**Scheduled for:**
Authors: Berendschot TTJM Kelly ER Kijlstra A van der Made SM Plat J	

Bernstein, Paul **For a** 30 minute talk	BIOAVAILABILITY OF A- AND B-CRYPTOXANTHIN IN SERUM, LIVER, AND OCULAR TISSUES OF JAPANESE QUAIL
Session: Carotenoids in the Eye II	**Scheduled for:**
Authors: Bernstein, P.S. Li, B. Vachali, P.P. Gorusupudi, A. Khachik, F.	

Bernstein, Paul **For a** Poster	HOW DOES THE HUMAN MACULA BECOME THE MACULA LUTEA? INACTIVITY OF HUMAN β,β-CAROTENE-9',10'-DIOXYGENASE (BCO2) UNDERLIES RETINAL ACCUMULATION OF THE HUMAN MACULAR CAROTENOID PIGMENT
Session: Carotenoids in the Eye II	**Scheduled for:** Friday, July 4
Authors: Bernstein, P.S. Li, B. Vachali, P.P. Gorusupudi, A. Shen, Z. Sharifzadeh, H. Besch, B.M. Nelson, K. Frederick, J.M. Baehr, W.	

Blaner, William **For a** 30 minute talk	CARDIAC DYSFUNCTION IN β-CAROTENE-15,15'-MONOOXYGENASE-DEFICIENT MICE IS ASSOCIATED WITH ALTERED CAROTENOID AND RETINOID METABOLISM
Session: Carotenoid Metabolism and Function I	**Scheduled for:** Tuesday, July 1
Authors: William S. Blaner Seung-Ah Lee Hongfeng Jiang Chad M. Trent Cynthia X. Wang Robert W. Curley Earl H. Harrison Mathew S. Maurer	

Böhm, Volker **For a** 30 minute talk	Lutein and zeaxanthin in patients with age-related macular degeneration: Supplement vs. oleaginous extract of kale
Session: Carotenoid Metabolism and Function II	**Scheduled for:** Thursday, July 3
Authors: Böhm, V. Arnold, C. Jentsch, S. Dawczynski, J.	

Bohn, Torsten **For a** 15 minute talk	BEFORE BIOACTIVITY THERE IS BIOAVAILABILITY - STATIC AND DYNAMIC IN VITRO MODELS FOR STUDYING CAROTENOID DIGESTION AND BIOACCESSIBILITY
Session: Carotenoid Metabolism and Function I	**Scheduled for:** Tuesday, July 1
Authors: Bohn, T. Corte-Real, J. Alminger, M. Aura, A.-M. Dufour, C. El, S.N. Karakaya, S. McDougall, G. Requena, T. Santos, N.S.	

BONET PIÑA, MARIA LUISA **For a** 30 minute talk	RETINOIC ACID AND BETA-CAROTENE EFFECTS ON ADIPOSITY
Session: Carotenoid Metabolism and Function II	**Scheduled for:** Thursday, July 3
Authors: Bonet, M.L. Ribot, J. Palou, A.	

Borel, Patrick **For a** 25 minute talk	SINGLE NUCLEOTIDE POLYMORPHISMS INVOLVED IN CHYLOMICRON METABOLISM PLAY A SIGNIFICANT ROLE IN THE INTERINDIVIDUAL VARIABILITY OF LUTEIN BIOAVAILABILITY.
Session: Epidemiology, Genetics, and Nutrition I	**Scheduled for:** Tuesday, July 1
Authors: Borel, P. Desmarchelier, C. Nowicki, M. Bott, R.	

Burri, Betty **For a** 15 minute talk	BETA-CRYPTOXANTHIN ABSORPTION AND METABOLISM
Session: Biosynthesis and Metabolism I	**Scheduled for:** Monday, June 30
Authors: Betty J. Burri Michael R. La Frano Tami Turner Xiao Qiu Chenghao Zhu Erik Geertz Yimeng Cai	

Canas, Jose **For a** 15 minute talk	EFFECT OF A 2-WEEK INTENSE LIFE-STYLE INTERVENTION PROGRAM FOLLOWED BY 6-MONTH CAROTENOID SUPPLEMENTATION ON FAT DEPOTS, ADIPONECTIN AND PALMITOLEATE: A 6-MONTH DOUBLE BLIND PLACEBO-CONTROLLED PILOT STUDY IN OBESE CHILDREN
Session: Carotenoid Metabolism and Function II	**Scheduled for:** Thursday, July 3
Authors: Canas, J.A Lochrie, A Galena-McGowan, A Hossain, J Schettino, C Balagopal, P	

Caris-Veyrat, Catherine **For a** 30 minute talk	STABILITY IN THE PRESENCE OF IRON AND ANTIOXIDANT ACTIVITY IN A MODEL OF THE GASTRO-INTESTINAL TRACT OF REFERENCE AND BACTERIAL CAROTENOIDS.
Session: Chronic Disease Prevention and Treatment I	**Scheduled for:** Monday, June 30
Authors: Caris-Veyrat, C. Sy, C. Borel, P. Dangles, O	

Cazzonelli, Christopher I. **For a** 30 minute talk	EPIGENETIC REGULATION AND FUNCTIONS FOR CIS-CAROTENOIDS; SIGNALING MOLECULES AND PLANT DEVELOPMENT
Session: Biosynthesis and Metabolism II	**Scheduled for:** Thursday, July 3
Authors: Cazzonelli, C. Hou, X. Watkins, J. Holland, S. Shashikanth, M. Pogson, B.	

Cervantes, Braulio **For a** Poster	CAROTENOID AND CHLOROPHYLL COMPOSITION AND ANTIOXIDANT ACTIVITY OF RAW AND HEAT PROCESSED JALAPEÑO PEPPERS AT INTERMEDIATE RIPENING STAGES
Session:	**Scheduled for:**
Authors: Cervantes-Paz B. Ornelas-Paz J. de J.	

Chandrasekaran, Raghu **For a** Poster	MODULATION OF XANTHOPHYLLS IN DIATOMS BY LIGHT SPECTRUM AND INTENSITY
Session:	**Scheduled for:**
Authors: Chandrasekaran, R. Barra, L. Giovagnetti, V. Corato, F. Ruban, A.V. Brunet, C.	

Chew, Emily **For a** Plenary	LUTEIN AND ZEAXANTHIN SUPPLEMENTATION AND COGNTIVE FUNCTION TESTING IN THE AGE-RELATED EYE DISEASE STUDY 2 (AREDS2)
Session: Carotenoids in the Eye and Brain	**Scheduled for:** Tuesday, July 1
Authors: Chew, E. Y. Clemons, T.E. Agrón, M.A. AREDS2 Research Group	

Cichon, Morgan **For a** Poster	Oxidative Metabolism of Lycopene
Session:	**Scheduled for:**
Authors: Cichon, M. J. Riedl, K. M. Moran, N. E. Grainger, E. M. Erdman, J. W., Jr. Clinton, S. K. Schwartz, S. J.	

Clinton, Steven **For a** 30 minute talk	What We Know and Don't Know About Tomatoes, Lycopene, and Prostate Cancer
Session: Chronic Disease Prevention and Treatment I	**Scheduled for:** Monday, June 30
Authors: Clinton, S.K.	

Cogdell, Richard **For a** Poster	The effects of lack of caroteniods on the light harvesting complexes of three species of purple photosynthetic bacteria
Session:	**Scheduled for:**
Authors: Richard Cogdell Sarah Henry Lewis MacDonald Kirsty Hacking	

Corte-Real, Joana **For a** 15 minute talk	SETTING UP MODELS FOR STUDYING THE EFFECT OF DIETARY MINERALS ON BIOAVAILABILITY ASPECTS OF CAROTENOIDS
Session: Epidemiology, Genetics, and Nutrition II	**Scheduled for:** Wednesday, July 2
Authors: Joana Corte-Real Elke Richling Lucien Hoffmann Torsten Bohn	

Craft, Neal **For a** Poster	EXTRACTION AND NORMAL-PHASE SEPARATION OF BRAIN CAROTENOIDS AND TOCOLS
Session:	**Scheduled for:**
Authors: Neal E. Craft	

Deli, József **For a** Plenary	Isolation and analysis of carotenoids from Zechmeister till today
Session: Chemical Synthesis, Analysis, and Industrial Production	**Scheduled for:** Wednesday, July 2
Authors: Deli, J	

Erdman, John **For a** 30 minute talk	LUTEIN AND THE BRAIN; APPLICATION OF THE NON-HUMAN PRIMATE MODEL TO EVALUATE LUTEIN BIODISTRIBUTION AND EFFECTS ON BRAIN FUNCTION
Session: Brain and Cognition	**Scheduled for:** Tuesday, July 1
Authors: Erdman, J.W. Sweedler, J.V. Rubakhin, S.S. Johnson, E.J. Neuringer, M. Kuchan, M.J.	

Eriksen, Jane Nygaard **For a** 15 minute talk	Optimized in vitro digestion system as screening tool to evaluate carotenoid accessibility – A potential model for human digestion
Session: Biosynthesis and Metabolism II	**Scheduled for:** Thursday, July 3
Authors: Eriksen, J. N. Dragsted, L. O. Arrigoni, E.	

Ermakov, Igor **For a** 30 minute talk	Optical Detection Methods for Carotenoids in Human Skin.
Session: Epidemiology, Genetics, and Nutrition II	**Scheduled for:** Wednesday, July 2
Authors: Ermakov, I.V. Ermakova, M.R. Sharifzadeh, M. Gellermann, W.	

Ermakov, Igor **For a** Poster	Optical Detection of Carotenoids in Human Bone and Surrounding Tissue.
Session:	**Scheduled for:**
Authors: Ermakov, I.V. Ermakova, M.R. Rosenberg, T.D. Gellermann, W.	

Ernawita, Ernawita **For a** Poster	EFFECT OF 1-METHYLCYCLOPROPENE ON CAROTENOIDS OF MINI TOMATOES (SOLANUM LYCOPERSICUM)
Session:	**Scheduled for:**
Authors: Ernawita Kélin Schwarz Volker Böhm Jocelem Mastrodi Salgado Julio Marcos Melges Walder	

Ernawita, Ernawita **For a** Poster	COMPOSITION AND CHARACTERIZATION OF CAROTENOIDS FROM JERUK TAKENGON (Citrus nobilis Lour.)
Session:	**Scheduled for:**
Authors: Ernawita Volker Böhm	

Esquivel, Patricia **For a** Poster	CHARACTERIZATION OF CAROTENOIDS IN THE PEELS OF COFFEE (COFFEA ARABICA) VARIETIES
Session:	**Scheduled for:**
Authors: Patricia Esquivel María Viñas Ralf M. Schweiggert Maike Gruschwitz Eric Guevara Reinhold Carle Víctor M. Jiménez	

Esquivel, Patricia **For a** Poster	PROFILES AND BIOACCESSIBILITY OF CAROTENOIDS FROM RED- AND YELLOW-FLESHED MAMEY SAPOTE (POUTERIA SAPOTA) FRUITS
Session:	**Scheduled for:**
Authors: Patricia Esquivel Tania Chacón-Ordóñez Reinhold Carle Víctor M. Jiménez Ralf M. Schweiggert	

Fang, Nan **For a** Poster	Extraction, purification and partial characterization of a carotenoid binding protein (CBP) from the epidermis of the monarch butterfly larvae (Danaus plexippus)
Session:	**Scheduled for:**
Authors: Nan Fang Lisandra Gonzalez Khoa Pham Jaroslava Miksovaka John T. Landrum	

Focsan, Alexandrina Ligia **For a** 15 minute talk	CALIBRATED ELECTROCHEMICAL MEASUREMENTS OF ASTAXANTHIN AND ITS ESTERS: INSIGHT INTO THE HEALTH AND PHOTOPROTECT MECHANISMS.
Session: Photochemistry, Photophysics, and Photosynthesis II	**Scheduled for:** Friday, July 4
Authors: A. Ligia Focsan Wesley Potter Lowell Kispert	

Frank, Harry **For a** Poster	Investigation of the excited state spectra and dynamics of rhodopinal glucoside from Rhodoblastus acidophilus 7050 grown under low-light conditions
Session:	**Scheduled for:**
Authors: Frank, H. A. Magdaong, N. Niedzwiedzki, D. M. LaFountain, A. M. Gardiner, A. T. Carey, A-M. Gibson, G. N. Cogdell, R. J.	

Ge, Zhiyuan **For a** Poster	HIGH CONCENTRATIONS OF KETOCAROTENOIDS IN THE HEPATIC MITOCHONDRIA OF A MOLTING RED SONGBIRD
Session:	**Scheduled for:**
Authors: Ge, Zhiyuan Johnson, James D. Cobine, Paul A. McGraw, Kevin J. Garcia, Rosana Hill, Geoffrey E.	

Gellenbeck, Kevin **For a** 15 minute talk	MIXED CAROTENOID UPTAKE IN A HUMAN CLINICAL STUDY COMPARING CONVENTIONAL (IMMEDIATE) AND SEQUENTIAL RELEASE FORMULATIONS
Session: Food and Biotechnology I	**Scheduled for:** Thursday, July 3
Authors: Gellenbeck, K.W. Venzon, D.S. Kazolova, V. Izzy, S. Intra, J.	

Ghosh, Robin **For a** Poster	HIGH-LEVEL PRODUCTION OF THE INDUSTRIAL PRODUCT, LYCOPENE, USING THE PHOTOSYNTHETIC BACTERIUM, RHODOSPIRILLUM RUBRUM
Session:	**Scheduled for:**
Authors: Robin Ghosh Guo-Shu Wang Hartmut Grammel Khaled Abou-Aisha Ruedi Saegesser	

Giuffrida, Daniele **For a** Poster	NATIVE CAROTENOIDS COMPOSITION OF SOME FRUITS FROM PANAMA
Session:	**Scheduled for:**
Authors: Giuffrida, D. Menchaca, D. Dugo, P. Donato, P. Cacciola, F. Murillo, E.	

Giuffrida, Daniele **For a** Poster	C50 CAROTENOIDS FROM THE CHEESE-RIPENING BACTERIA ARTHROBACTER ARILAITENSIS
Session:	**Scheduled for:**
Authors: Giuffrida, D. Sutthiwong, N. Dugo, P Donato, P. Cacciola, F. Fouillaud, M. Caro, Y Dufossé, L.	

Gonzalez, Daniel **For a** Poster	Zeaxanthin Aggregation: A Quasi-Reversible System
Session:	**Scheduled for:**
Authors: Gonzalez, D. A. Babino, D. Ginory-Perez, J. Landrum, J. T.	

Gorusupudi, Aruna **For a** Poster	COMPARATIVE BIOAVAILABILITY AND BIOACCUMULATION OF XANTHOPHYLLS WITH β-CAROTENE IN A TRANSGENIC MOUSE MODEL.
Session:	**Scheduled for:**
Authors: Gorusupudi, A. Vachali, P.P. Li, B. Shen, Z. Besch, B. M. Nelson, K. Bernstein, P.S.	

Hammond, Billy **For a** 30 minute talk	EFFECTS OF THE MACULAR CAROTENOIDS ON BEHAVIORAL AND NEURAL MEASURES OF BRAIN FUNCTION.
Session: Carotenoids in the Eye I	**Scheduled for:** Monday, June 30
Authors: Billy R. Hammond, Jr. Emily R. Bovier Lisa M. Renzi	

Harrison, Earl **For a** Plenary	CAROTENOID METABOLISM IN ANIMALS INCLUDING HUMANS: FORMATION, OCCURRENCE AND FUNCTION OF APOCAROTENOIDS
Session: Carotenoid Metabolism and Function	**Scheduled for:** Tuesday, July 1
Authors: Earl H. Harrison Carlo dela Sena Jian Sun Sureshbabu Narayanasamy Kenneth M. Riedl Robert W. Curley, Jr. Steven J. Schwartz	

Hashimoto, Hideki **For a** 30 minute talk	Ultrafast excited state dynamics of marine carotenoid fucoxanthin and its homologues
Session: Photochemistry, Photophysics, and Photosynthesis I	**Scheduled for:** Monday, June 30
Authors: Hashimoto, H. Kosumi, D. Fujii, R. Sugisaki, M. Iha, M. Sakaguchi, K. Katsumura. S.	

Hashimoto, Hideki **For a** Poster	Influence of Surrounding Environments on the Electronic and Vibronic Properties of Spheroidene
Session:	**Scheduled for:**
Authors: Hashimoto, H. Tonouchi, N. Kosumi, D. Nango, M. Sugisaki, M.	

Hirschberg, Joseph **For a** 15 minute talk	MOLECULAR AND BIOCHEMICAL CHARACTERIZATIONS OF THE BACTERIAL PHYTOENE DESATURASE CRTI SUGGEST A DIVERGENT EVOLUTION OF THE CAROTENOID BIOSYNTHESIS ENZYMES IN PLANTS
Session: Biosynthesis and Metabolism II	**Scheduled for:** Thursday, July 3
Authors: Hirschberg, J. Jubran, H. Filler, S. Dery, O. Enfissi, E.M. Fraser, P.D. Beyer, P.	

Hosokawa, Masashi **For a** 15 minute talk	METABOLIC CONTROL VIA UP-REGULATION OF PGC-1 REGULATORY FACTORS BY FUCOXANTHIN
Session: Carotenoid Metabolism and Function II	**Scheduled for:** Thursday, July 3
Authors: Masashi Hosokawa Riho Tateyama Ai Koide Kazuo Miyashita	

IP, Blanche **For a** 15 minute talk	Lycopene supplementation inhibits high saturated-fat diet-promoted hepatic tumorigenesis via differential mechanisms depending on beta-carotene-9',10'-oxygenase expression in mice
Session: Chronic Disease Prevention and Treatment I	**Scheduled for:** Monday, June 30
Authors: IP, B.C. Liu, C. Smith, D.E. von Lintig, J. Wang, X-D.	

IP, Blanche **For a** Poster	Lycopene and apo-10'-lycopenoic acid inhibited high saturated fat diet-induced liver steatosis in beta-carotene-9',10'-oxygenase knockout mice
Session:	**Scheduled for:**
Authors: IP, B.C. Liu, C. Lichtenstein, A.H. von Lintig, J. Wang, X-D.	

Ishiki, Manabu **For a** 30 minute talk	The impact of astaxanthin on glucose metabolism.
Session: Chronic Disease Prevention and Treatment II	**Scheduled for:** Thursday, July 3
Authors: Ishiki M Nishida Y Ishibashi H Wada T Takikawa A Sasaoka T Usui I Tobe K	

Jahns, Lisa **For a** 25 minute talk	SKIN AND PLASMA CAROTENOID RESPONSE TO A PROVIDED INTERVENTION DIET HIGH IN VEGETABLES AND FRUITS: UPTAKE AND DEPLETION KINETICS
Session: Epidemiology, Genetics, and Nutrition I	**Scheduled for:** Tuesday, July 1
Authors: Jahns, L Johnson L.K Mayne, S.T Cartmel, B Picklo, M.J Ermakov, I.V Gellermann, W Whigham, L.D	

Jimenez, Victor M. **For a** Poster	THE ULTRASTRUCTURE OF MAMEY SAPOTE (POUTERIA SAPOTA) CHROMOPLASTS
Session:	**Scheduled for:**
Authors: Jiménez V.M. Chacón-Ordóñez, T. Schweiggert, R.M. Carle, R. Esquivel, P.	

Johnson, Elizabeth **For a** 30 minute talk	LOCALIZATION OF LUTEIN IN NON HUMAN PRIMATE BRAIN AND ITS POTENTIAL ROLE IN BRAIN HEALTH
Session: Brain and Cognition	**Scheduled for:** Tuesday, July 1
Authors: Elizabeth J. Johnson Emily S. Mohn Martha Neuringer Natalia Crivello John W. Erdman	

Juturu, Vijaya **For a** Poster	LUTEIN IMPROVES VISUAL FUNCTION IN EARLY-STAGE STREPTOZOTOCIN-INDUCED DIABETIC RATS
Session:	**Scheduled for:**
Authors: Deshpande J Reddy B G Shankaranarayanan J Bhattacharya A Juturu V	

Kaulmann, Anouk **For a** 15 minute talk	FRUIT AND VEGETABLE CONSUMPTION, CAROTENOIDS AND INFLAMMATORY SIGNALLING PATHWAYS
Session: Chronic Disease Prevention and Treatment II	**Scheduled for:** Thursday, July 3
Authors: Kaulmann, A. Bohn, T.	

Kaulmann, Anouk **For a** Poster	CAROTENOID AND POLYPHENOL PROFILES OF CABBAGE AND PLUM VARIETIES AND THEIR CONTRIBUTION TO TOTAL ANTIOXIDANT CAPACITY
Session:	**Scheduled for:**
Authors: Kaulmann,A. Bohn, T. Hoffmann,L. Schneider, Y.J.	

Kawashima, Yuki **For a** Poster	Development of PANAFERD-ZX: Zeaxanthin Enriched Dry Cell using Paracoccus carotinifacience
Session:	**Scheduled for:**
Authors: Kawashima, Y. Nagai, H. Ikarashi, M. Maoka, T.	

Khachik, Frederick **For a** 30 minute talk	Synthesis of isotopically labelled carotenoids for metabolic studies
Session: Chemical Synthesis, Analysis, and Industrial Production I	**Scheduled for:** Tuesday, July 1
Authors: Khachik, Frederick	

Kim, Youn-Kyung **For a** Poster	EXPLORING THE FUNCTION OF BETA-CAROTENE 15,15'-OXYGENASE IN RETINOID AND LIPID METABOLISM
Session:	**Scheduled for:**
Authors: Kim, Y.K. Dixon, J.L. Brinker, A. Zuccaro, M. Quadro, L.	

Kispert, Lowell **For a** Poster	Carotenoid Neutral Radicals in Photoprotection
Session:	**Scheduled for:**
Authors: Lowell Kispert Adam Maygar Ligia Focsan Péter Molnár József Deli	

Koo, Sangho **For a** 30 minute talk	Synthesis of Unnatural Carotenoids, and Their Applications
Session: Chemical Synthesis, Analysis, and Industrial Production I	**Scheduled for:** Tuesday, July 1
Authors: Koo, S. Oh, E.-T. Kim, Y. H. Lim, B. Choi, J. A. Park, M.	

Kopec, Rachel **For a** Poster	STABILITY OF CAROTENOIDS THROUGH THE DIGESTIVE PROCESS: IN VITRO STUDIES OF OXIDATION
Session:	**Scheduled for:**
Authors: Kopec, R. E. Borel, P. Desmarchelier, C. Carail, M. Caris-Veyrat, C.	

Kopsell, Dean **For a** Poster	Carotene Enhancement in Specialty Vegetable Crops through Exogenous Applications of Ionone Compounds
Session:	**Scheduled for:**
Authors: Kopsell, D. K. Goldman, I. L. Wiepz, R. Turman, D. L. Kopsell, D. E.	

Kucuk, Omer **For a** 30 minute talk	Lycopene in the prevention of genitourinary tumors
Session: Chronic Disease Prevention and Treatment II	**Scheduled for:** Thursday, July 3
Authors: Omer Kucuk Kazim Sahin Engin Yenice Mehmet Tuzcu Cemal Orhan Cengizhan Mizrak Ibrahim Ozercan Nurhan Sahin Karina Ciccone Chris Giardina	

LaFountain, Amy **For a** Poster	Investigation into the mechanisms of carotenoid coloration in avian plumage: A broad survey of carotenoid coloration from a diversity of feathers
Session:	**Scheduled for:**
Authors: LaFountain, A. M. Chen, X. Frank, H. A. Prum, R. O.	

Lakshminarayana, R. **For a** Poster	DETERMINATION OF POSSIBLE LUTEIN OXIDATION PRODUCTS IN RAT TISSUES AND OPTIMIZATION OF ANALYTICAL METHODS
Session:	**Scheduled for:**
Authors: Lakshminarayana, R. Sowmya, P.R. Arathi, B.P. Vijay, K Baskaran, V	

Landrum, John **For a** 30 minute talk	The Macular Pigment: Carotenoid Accumulation in the Developing Macaque Retina
Session: Carotenoids in the Eye II	**Scheduled for:** Friday, July 4
Authors: Landrum, J. T.	

Lee, Seung-Ah **For a** Poster	CARDIAC DYSFUNCTION IN BCMO1 KNOCKOUT MICE IS ASSOCIATED WITH ALTERED RETINOID AND LIPID METABOLISM
Session:	**Scheduled for:**
Authors: Seung-Ah Lee Hongfeng Jiang Chad M. Trent Jason Yuen Robert W. Curley, Jr Earl H. Harrison Mathew S. Maurer William S. Blaner	

Li, Binxing **For a** Poster	Crystallization of the Human Ocular Carotenoid-Binding Proteins
Session:	**Scheduled for:**
Authors: Li, B. Sharifzadeh, H. Horvath, M. Bernstein, P. S.	

Li, Binxing **For a** Poster	Long-Term Zeaxanthin Supplementation to the Mouse Retina
Session:	**Scheduled for:**
Authors: Li, B. Vachali, P.P.. Gorusupudi, A., Shen, Z. Besch, B. M. Nelson, K. Bernstein, P.S..	

Li, Xinli **For a** Poster	Dietary or circulating lycopene and stroke risk: a meta-analysis of prospective trials
Session:	**Scheduled for:**
Authors: Xinli LI Jiuhong XU	

Lietz, Georg **For a** 30 minute talk	Simplified approaches for estimating vitamin A stores and β-carotene bioconversion in humans
Session: Epidemiology, Genetics, and Nutrition II	**Scheduled for:** Wednesday, July 2
Authors: Lietz, G. Park, H. Oxley, A. Boddy, A. Berry, P. Wyss, A. Schalch, W. Green, M.H.	

Lietz, Georg **For a** Poster	Gender differences in retinol metabolism are independent of β-carotene bioconversion
Session:	**Scheduled for:**
Authors: Lietz, G. Oxley, A. Berry, P. Hesketh, J. Tourniaire, F. Boddy, A.	

Linnewiel Hermoni, Karin **For a** 15 minute talk	CAROTENOID DERIVATIVE INHIBIT NFkB IN BONE AND CANCER CELLS BY TARGETING KEY THIOL GROUPS
Session: Chronic Disease Prevention and Treatment II	**Scheduled for:** Thursday, July 3
Authors: Linnewiel-Hermoni, K Levy, J. Sharoni, Y	

Liu, Jianguo **For a** Poster	MASS-SCALE CUTIVATION OF UNICELLULAR GREEN ALGA HAEMATOCOCCUS PLUVIALIS FOR NATURAL ASTAXANTHIN
Session:	**Scheduled for:**
Authors: Jian-guo Liu John P van der Meer Li-tao Zhang Yong Zhang	

Liu, Jianguo **For a** Poster	EFFECTS OF MICROALGAL ASTAXANTHIN AND CAROTENOIDS ON ACUTE RENAL INJURY PROPHYLAXIS IN MALE WISTAR RATS
Session:	**Scheduled for:**
Authors: Jianguo Liu Jun He Yong Zhang Yang Doris Liu Hong Gao	

Lokstein, Heiko **For a** Poster	CAROTENOID-CHLOROPHYLL INTERACTIONS IN PHOTOSYNTHETIC PIGMENT-PROTEIN COMPLXES ELUCIDATED BY NON-LINEAR SPECTROSCOPY
Session:	**Scheduled for:**
Authors: Heiko Lokstein Alexander Betke Klaus Teuchner	

Lorantfy, Bettina **For a** 15 minute talk	Integrated bioprocess development with extreme Halophiles for carotenoid production
Session: Chemical Synthesis, Analysis, and Industrial Production II	**Scheduled for:** Wednesday, July 2
Authors: Lorantfy, B. Herwig, C.	

Magdaong, Nikki **For a** Poster	Optical spectroscopic investigation of native and recombinant peridinin-chlorophyll a-protein complexes
Session:	**Scheduled for:**
Authors: Magdaong, N. M. Enriquez, M. M. Schulte, T. Niedzwiedzki, D. M. Hofmann, E. Hiller, R. Frank, H. A.	

Makuch, Krzysztof **For a** Poster	A MOLECULAR DYNAMICS SIMULATION STUDY OF LUTEIN AND ZEAXANTHIN ARRANGEMENTS IN THE PHOSPHOLIPID BILAYER
Session:	**Scheduled for:**
Authors: Krzysztof Makuch Michał Markiewicz Marta Pasenkiewicz-Gierula	

Mares, Julie **For a** 25 minute talk	EPIDEMIOLOGICAL EVIDENCE FOR DETERMINANTS OF MACULAR PIGMENT RESPONSE TO THE INTAKE OF LUTEIN AND ZEAXANTHIN
Session: Epidemiology, Genetics, and Nutrition I	**Scheduled for:** Tuesday, July 1
Authors: Mares, J.M. Meyers, K.J. Liu, Z. Johnson, E. Snodderly, D. M.	

Martinez, Ana **For a** Poster	ANTIOXIDANT, ANTIREDUCTANTS, ANTIRADICALS OR FREE RADICALS SCAVENGERS?
Session:	**Scheduled for:**
Authors: Martinez, A. Sliwka, H.R. Partali, V. Zeeshan, M. Stinco, C.M. Melendez-Martínez, A.J.	

Martinez, Ana **For a** Poster	FINITE VALUES OF INFINITE POLYENES
Session:	**Scheduled for:**
Authors: Martinez, A. Sliwka, H.R. Partali, V. Zeeshan, M.	

Mayorga, Maria **For a** 30 minute talk	CAROTENOIDS FROM FATTY YEAST
Session: Chemical Synthesis, Analysis, and Industrial Production II	**Scheduled for:** Wednesday, July 2
Authors: Mayorga, M. Laprade, L. Farrell, C. Houston, P. Grenfell-Lee, D. Trueheart, J.	

Mazeikiene, Asta **For a** Poster	THE ASSOCIATION OF SERUM CAROTENOID CONCENTRATION WITH SINGLE NUCLEOTIDE POLYMORPHISMS IN APOE, BCMO1, HL AND FABP GENES
Session:	**Scheduled for:**
Authors: Mazeikiene, A. Jakaitiene, A Arasimavicius, J. Domarkiene, I. Uktveryte, I. Ambrozaityte, L. Kucinskiene, Z.A. Kucinskas, V.	

McGraw, Kevin **For a** 30 minute talk	Sex and disease in the city: links between carotenoid coloration, parasites, and urbanization
Session: Biosynthesis and Metabolism I	**Scheduled for:** Monday, June 30
Authors: McGraw, K. J. Giraudeau, M.	

McQuinn, Ryan **For a** Poster	IMPROVING STRATEGIES FOR THE ENHANCEMENT OF CAROTENOIDS IN CROPS
Session:	**Scheduled for:**
Authors: McQuinn, R. Wong, B. Giovannonim, J.	

MELENDEZ-MARTINEZ, ANTONIO J. **For a** Plenary	THE “INVISIBLE CAROTENOIDS” PHYTOENE AND PHYTOFLUENE.
Session: Food and Biotechnology	**Scheduled for:** Thursday, July 3
Authors: Meléndez-Martínez, A.J.	

MELENDEZ-MARTINEZ, ANTONIO J. **For a** Poster	Dietary sources of phytoene and phytofluene in Spain: Mediterranean Diet vs exotic foods
Session:	**Scheduled for:**
Authors: Meléndez-Martínez, A.J. Stinco, C.M. Hernanz, D. Murillo, E. Benítez-González, A.M.	

Mendes Pinto, Maria Manuela **For a** Poster	INSIGHTS INTO MOLECULAR MECHANISMS UNDERLYING CAROTENOID ABSORPTION SHIFTS
Session:	**Scheduled for:**
Authors: Maria Manuela Mendes Pinto Bruno Robert	

Mendez, Vanesa **For a** Poster	A Virtual Model for Development of Macular Pigment in the Macaque Retina
Session:	**Scheduled for:**
Authors: Vanesa Mendez Yisi Cao Martha Neuringer John T. Landrum	

Mendez, Vanesa **For a** Poster	Direct Observation of Differences of Carotenoid Polyene Chain cis/trans Isomers Resulting from Structural Topology
Session:	**Scheduled for:**
Authors: Vanesa Mendez Emily R. Schenk Mark E. Ridgewa Melvin A. Park Francisco Fernandez-Lima John T. Landrum	

Mihály, Johanna **For a** Poster	REDUCED CAROTENOID AND RETINOID CONCENTRATIONS AND ALTERED ISOMER-RATIO IN SERUM OF ATOPIC DERMATITIS PATIENTS
Session:	**Scheduled for:**
Authors: Mihaly, J. Lowe, G Graham, D Szklenar, M Torocsik, D Ruhl, R	

Moore, Ana **For a** Poster	INVOLVEMENT OF CAROTENOIDS IN PHOTOSYNTHETIC REGULATION AND PHOTOPROTECTION
Session:	**Scheduled for:**
Authors: Moore A. L. Moore, T. A. Gust, D.	

Moore, Thomas **For a** 30 minute talk	ARTIFICIAL PHOTOSYNTHESIS – HELPING NATURE REGAIN CONTROL OF THE GLOBAL CARBON CYCLE
Session: Photochemistry, Photophysics, and Photosynthesis II	**Scheduled for:** Friday, July 4
Authors: Moore, T. A. Moore, A. L. Gust, D.	

Moran, Nancy **For a** 15 minute talk	13C-CAROTENOIDS FROM TOMATO CELL CULTURES FOR STUDIES OF HUMAN KINETICS AND METABOLISM
Session: Carotenoid Metabolism and Function I	**Scheduled for:** Tuesday, July 1
Authors: Moran, N.E. Cichon, M.J. Novotny, J.A. Grainger, E.M. Rogers, R.B. Riedl, K.M. Schwartz, S.J. Erdman, Jr. J.W. Clinton, S.K.	

Moran, Rachel **For a** 15 minute talk TBD	The relationship between dietary intake of Lutein (L) and Zeaxanthin (Z) and their concentrations in serum: Introduction of a novel L/Z dietary screener
Session: Epidemiology, Genetics, and Nutrition I	**Scheduled for:** Tuesday, July 1
Authors: Moran, Rachel Johnson, Elizabeth Stack, Jim Akuffo, Kwadwo Loskutova, Ekaterina Beatty, Stephen Nolan, John	

Murillo, Enrique **For a** Poster	PROVITAMIN A ACTIVITY OF β, κ-CAROTENOIDS USING PURIFIED RECOMBINANT HUMAN β-CAROTENNE 15,15'-OXYGENASE (BCO1)
Session:	**Scheduled for:**
Authors: Murillo, E. Reyna, G. dela Seña, c. Harrison, E. H.	

Neuringer, Martha **For a** 30 minute talk	LUTEIN AND ZEAXANTHIN IN THE MACULA AND BRAIN OF NONHUMAN PRIMATES: STRUCTURAL AND FUNCTIONAL ROLES
Session: Brain and Cognition	**Scheduled for:** Tuesday, July 1
Authors: Neuringer, M. Renner, L Johnson, E.J. Erdman, J.W.	

Ng, Mei Han **For a** 15 minute talk	PURIFICATION AND PRODUCTION OF PALM OIL CAROTENES USING SUPERCRITICAL FLUID CHROMATOGRAPHY
Session: Chemical Synthesis, Analysis, and Industrial Production II	**Scheduled for:** Wednesday, July 2
Authors: Ng, M.H. Choo, M.H.	

Nguyen, Lori **For a** 15 minute talk	Evaluating the relationship between fruit and vegetable intake using plasma and dermal biomarkers and reported dietary intake in 4th-grade children
Session: Epidemiology, Genetics, and Nutrition I	**Scheduled for:** Tuesday, July 1
Authors: Lori M. Nguyen Rachel E. Scherr Igor V. Ermakov Werner Gellermann Carl L. Keen Sheridan Miyamoto Francene Steinberg Heather M. Young Sheri Zidenberg-Cherr	

Niedzwiedzki, Dariusz **For a** Poster	Investigation of the Carotenoid-to-Bacteriochlorophyll Energy Transfer in the LH2 Complexes Containing Carotenoids With Conjugation Length From 9 to 15
Session:	**Scheduled for:**
Authors: Dariusz M. Niedzwiedzki	

Niedzwiedzki, Dariusz **For a** Poster	Photophysical Properties of a Synthetic, Carbonyl-Containing (N = 6+C=O) Carotenoid Analogue
Session:	**Scheduled for:**
Authors: Dariusz M. Niedzwiedzki	

Nolan, John **For a** 30 minute talk	SUPPLEMENTATION WITH THREE DIFFERENT MACULAR CAROTENOID FORMULATIONS IN PATIENTS WITH EARLY AMD: RESULTS AFTER 36 MONTHS OF SUPPLEMENTATION
Session: Carotenoids in the Eye I	**Scheduled for:** Monday, June 30
Authors: Nolan, J. Stack, J. Akuffo, K. Howard, A. Beatty, S.	

Obana, Akira **For a** 15 minute talk	INFLUENCE OF CATARACTS ON AUTOFLUORESCENCE-BASED MACULAR PIGMENT IMAGING
Session: Carotenoids in the Eye II	**Scheduled for:** Friday, July 4
Authors: Obana A Gohto Y Seto T Ueno T Yoshino M Sharifzadeh M Gellermann W	

ODonoghue, Adam **For a** Poster	Development of a high cis-lycopene tangerine tomato as a functional food for countering prostate cancer
Session:	**Scheduled for:**
Authors: ODonoghue, A. MingXia, H. Fanning, K. Netzel, G. Walker, I. O. McGrath, D. J. Dillon, N. L. OHare, T. J.	

O'Hare, Tim **For a** 25 minute talk	ZEAXANTHIN BIOFORTIFICATION OF SWEET-CORN AND FACTORS AFFECTING ZEAXANTHIN ACCUMULATION AND COLOR CHANGE
Session: Food and Biotechnology I	**Scheduled for:** Thursday, July 3
Authors: O'Hare, T. J. Fanning, K. J. Martin, I. F.	

Ortiz, Darwin **For a** Poster	CHANGES IN THE CAROTENOID PROFILES OF BIOFORTIFIED CORN CULTIVARS AT PRE-HARVEST AND STORAGE STAGES
Session:	**Scheduled for:**
Authors: Darwin Ortiz Torbert Rocherford Bruce R. Hamaker Dominique Dufour Mario G. Ferruzzi	

Palmer, Amanda **For a** 30 minute talk	IMPACT OF PROTOVITAMIN A BIOFORTIFIED MAIZE FLOUR CONSUMPTION ON AFLATOXIN ADDUCT CONCENTRATIONS OF ZAMBIAN CHILDREN
Session: Epidemiology, Genetics, and Nutrition II	**Scheduled for:** Wednesday, July 2
Authors: Palmer, A. Chileshe, J. Schulze, K. Siamusantu, W. Klemm, R. Barffour, M. Groopman, J. West Jr., K.	

Pintea, Adela **For a** Poster	EFFECT OF ESTERIFICATION ON THE ANTIOXIDANT ACTIVITY OF ZEAXANTHIN
Session:	**Scheduled for:**
Authors: Pintea, A. Bunea, A. Socaci, S. Socaciu, C.	

Pogson, Barry **For a** 30 minute talk	
Session: Biosynthesis and Metabolism II	**Scheduled for:** Thursday, July 3
Authors:	

Polivka, Tomas **For a** 30 minute talk	TUNING SPECTROSCOPIC PROPERTIES OF CAROTENOIDS BY SMALL CHANGES IN CAROTENOID STRUCTURE
Session: Photochemistry, Photophysics, and Photosynthesis I	**Scheduled for:** Monday, June 30
Authors: T. Polivka M. Fuciman V. Slouf G. Kesan M. Kabelac	

Polyakov, Nikolay **For a** 15 minute talk	Supramolecular chemistry of xanthophyll carotenoids.
Session: Chemical Synthesis, Analysis, and Industrial Production I	**Scheduled for:** Tuesday, July 1
Authors: Polyakov N. E. Selyutina O. Yu. Apanasenko I. E. Suntsova L. P. Dushkin A. V. Magyar A. Kispert L.D. Vachali P. Bernstein P. S.	

Polyakov, Nikolay **For a** Poster	STABILIZATION OF XANTHOPHYLL CAROTENOIDS BY WATER SOLUBLE OLIGOSACCHARIDES AND POLYSACCHARIDES.
Session:	**Scheduled for:**
Authors: Polyakov N. E. Apanasenko I. E. Selyutina O. Yu. Suntsova L. P. Dushkin A. V. Kispert L.D. Vachali P. Bernstein P. S.	

Quadro, Loredana **For a** Plenary	THE ROLE OF BETA-CAROTENE AND ITS ASYMMETRIC CLEAVAGE ENZYME DURING MAMMALIAN EMBRYOGENESIS
Session: Epidemiology, Genetics, and Nutrition	**Scheduled for:** Wednesday, July 2
Authors: Quadro, L , Spiegler, E.	

Rafacho, Bruna **For a** Poster	THE EFFECT OF BETA-CRYPTOXANTHIN SUPPLEMENTATION ON HEPATIC STEATOSIS AND INFLAMMATION IN BETA-CAROTENE-9'10'-OXYGENASE KNOCKOUT MICE
Session:	**Scheduled for:**
Authors: Rafacho, B. P. M. Liu. C Dong, Y. M. von Lintig, J. Wang, X-D.	

Ravi Kumar, Sangeetha **For a** 15 minute talk	PROTECTIVE EFFECTS OF ASTAXANTHIN AND SQUALENE: INDIVIDUAL AND COMBINED EFFECTS IN HIGH-FAT FED KK-AY MICE
Session: Biosynthesis and Metabolism I	**Scheduled for:** Monday, June 30
Authors: Ravi Kumar, S. Miyashita, K. Hosokawa, M.	

Richer, Stuart **For a** 15 minute talk	The Scripps Institute Early Biomarkers of AMD (EBAMD) Study –Foveal Macula Pigment Depression Data and Analysis,– including serum carotenoids: IRB-11-5677
Session: Carotenoids in the Eye I	**Scheduled for:** Monday, June 30
Authors: Richer, S. P. Pratt, S. G. Blake, P. Roberson, D. Rutledge, G. Pratt, G. Podella, C.	

Robert, Bruno **For a** 30 minute talk	RELATING THE STRUCTURE OF CAROTENOID ELECTRONIC STATES TO THEIR FUNCTION
Session: Photochemistry, Photophysics, and Photosynthesis II	**Scheduled for:** Friday, July 4
Authors: Robert B. Mendes Pinto M. M. Galzerano D. Pascal A. A. Gall A. Ilioaia C.	

Rodriguez-Amaya, Delia **For a** 25 minute talk	Overview of current carotenoid research in foods: From analysis to processing effects and health implications
Session: Food and Biotechnology I	**Scheduled for:** Thursday, July 3
Authors: Delia B. Rodriguez-Amaya	

Rubin, Lewis **For a** 30 minute talk	RETINAL PIGMENT EPITHELIAL CELL MODELS FOR INTERROGATING PROTECTIVE FUNCTIONS OF XANTHOPHYLLS IN RETINOPATHIES
Session: Carotenoids in the Eye II	**Scheduled for:** Friday, July 4
Authors: Gong, X. Harrell, M.L. Mitchell, D.C. Sundin, O.H. Vachali, P. Gonzalez-Fernandez, F. Bernstein, P.S. Rubin, L.P.	

Rubin, Lewis **For a** TBD	"IT'S NOT ONLY AMD": RETINAL XANTHOPHYLLS IN PREVENTION AND TREATMENT OF RETINOPATHY OF PREMATURITY AND DIABETIC RETINOPATHY
Session:	**Scheduled for:**
Authors: Rubin, L.P.	

Rühl, Ralph **For a** 15 minute talk	BENEFICIAL EFFECTS OF LYCOPENE FOR ASTHMA ARE MEDIATED VIA ALTERED EICOSANOID / DOCOSANOIDS REGULATION IN ANIMAL ASTHMA MODELS
Session: Chronic Disease Prevention and Treatment II	**Scheduled for:** Thursday, July 3
Authors: Birta, E. Szklenar, M. Bohn, T. Bacsi, A. Rühl, R.	

Scholes, Greg **For a** Plenary	Ultrafast energy transfer and carotenoids in photosynthesis
Session: Photochemistry, Photophysics, and Photosynthesis	**Scheduled for:** Monday, June 30
Authors: Scholes, G. D. Ostroumov, E. E.	

Sharifzadeh, Mohsen **For a** Poster	IMAGING OF MACULAR PIGMENT IN INFANTS AND CHILDREN
Session:	**Scheduled for:**
Authors: Mohsen Sharifzadeh Paul S. Bernstein Werner Gellermann	

Sharoni, Yoav **For a** 30 minute talk	Mechanisms for the effects of carotenoids and their derivatives in cancer prevention and in bone health: the role of insulin-like growth factor and the NFkB transcription system.
Session: Chronic Disease Prevention and Treatment I	**Scheduled for:** Monday, June 30
Authors: Yoav Sharoni Karin Linnewiel-Hermoni Othaila Waked-Adawi Joseph Levy	

Shindo, Kazutoshi **For a** Poster	NEW AND RARE CAROTENOIDS WITH CARBON 30 OR 40 SKELETONS, ISOLATED FROM MARINE BACTERIA AND THEIR ANTIOXIDANT ACTIVITIES
Session:	**Scheduled for:**
Authors: Kazutoshi Shindo Norihiko Misawa	

Sliwka, Richard **For a** Poster	CAN CAROTENOIDS CONTRIBUTE TO GENE THERAPY?
Session:	**Scheduled for:**
Authors: Hans-Richard Sliwka Vassilia Partali Christer. L. Øpstad, Emile Jubeli Michael D. Pungente	

Smith, Joshua **For a** 15 minute talk	SCREENING AND SELECTION OF HIGH LUTEIN AND ALPHA-TOCOPHEROL PRODUCING CARROT CELL CULTURE LINES FOR 13C ISOTOPIC LABELING AND IN VIVO BIOLOCALIZATION STUDIES
Session: Brain and Cognition	**Scheduled for:** Tuesday, July 1
Authors: Smith, J. W. Rogers, R. B. Rubakhin, S. S. Sweedler, J. V. Johnson, E. J. Neuringer, M. Kuchan, M. J. Erdman, J. W. Jr.	

Smith, Joshua **For a** Poster	FUNCTIONS OF CAROTENOID OXYGENASES: BEYOND CAROTENOID METABOLISM
Session:	**Scheduled for:**
Authors: Smith, J. W. Ford, N. A. Clinton, S. K. Erdman, J. W. Jr.	

Socaciu, Carmen **For a** 25 minute talk	Nano- and micro-encapsulation of carotenoids: innovative technologies to improve stability and controlled release
Session: Food and Biotechnology I	**Scheduled for:** Thursday, July 3
Authors: Socaciu, C. Pop, O. Sconta, Z. Pop, R.	

Sowmya, Poorigali **For a** Poster	CYTOTOXICITY AND ANTI-PROLIFERATION OF HELA CELLS BY CAROTENOIDS IS DEPEND ON SELECTIVE MODE OF DELIVERY VEHICLE
Session:	**Scheduled for:**
Authors: Sowmya, P.R. Arathi, B. P. Vijay, K. Krishnamurthy, H. Baskaran, V. Lakshminarayana, R.	

Strzałka, Kazimierz **For a** Poster	DIADINOXANTHIN DE-EPOXIDASES OF TWO PHEODACYLUM TRICORNUTUM STRAINS: UTEX 646 AND CCAP 1055/1
Session:	**Scheduled for:**
Authors: Kazimierz Strzałka Monika Bojko Monika Olchawa-Pajor Dariusz Latowski	

Taylor, Richard **For a** 15 minute talk	Regulatory Hurdles for Carotenoid Commercialization
Session: Chemical Synthesis, Analysis, and Industrial Production II	**Scheduled for:** Wednesday, July 2
Authors: Taylor, R.F.	

Tripodo, Giusy **For a** Poster	BIOACCESSIBILITY OF PHYTOENE AND PHYTOFLUENE FROM ORANGES. EFFECT OF SQUEEZING AND DIETARY FAT
Session:	**Scheduled for:**
Authors: Tripodo, G. Pumilia, G. Stinco, C.M. Vicario, I.M. Giuffrida, D. Dugo, P. Dugo, G,mo Melendez-Martinez A. J.	

Tripodo, Giusy **For a** Poster	STUDY OF THE CAROTENOIDS ESTERS IN DIVERSE CITRUS CULTIVARS
Session:	**Scheduled for:**
Authors: Tripodo, G. Giuffrida, D. Stinco, C.M. Dugo, P. Dugo, G.mo Vicario, I. M. Melendez-Martinez A. J.	

Tsuchida, Kozo **For a** 30 minute talk	THE MOLECULAR ANALYSIS OF TISSUE-SPECIFIC DELIVERY FOR CERTAIN CAROTENOIDS IN THE SILKWORM BOMBYX MORI
Session: Biosynthesis and Metabolism I	**Scheduled for:** Monday, June 30
Authors: Kozo Tsuchida Takashi Sakudoh	

Uragami, Chiasa **For a** Poster	The Raman Spectroscopic Study on Siphonous Green Alga, Codium intricatum, Cultivated at Two Different Kinds of Light Condition
Session:	**Scheduled for:**
Authors: Uragami, C. Galzerano, D. Gall, A. Shigematsu, Y. Meisterhans, M. Oka, N. Iha, M Fujii, R. Robert, B. Hashimoto, H.	

Vachali, Preejith **For a** 15 minute talk	SURFACE PLASMON RESONANCE (SPR)-BASED BIOSENSOR TECHNOLOGY FOR THE QUANTITATIVE CHARACTERIZATION OF PROTEIN-CAROTENOID INTERACTIONS.
Session: Carotenoid Metabolism and Function II	**Scheduled for:** Thursday, July 3
Authors: Vachali, P.P. Li,B. Besch, B.M. Nelson, K. Bernstein, P.S.	

Vachali, Preejith **For a** Poster	RETINAL UPTAKE OF MACULAR PIGMENTS IN TRANSGENIC MOUSE MODELS.
Session:	**Scheduled for:**
Authors: Vachali, P.P. Li,B. Gorusupudi, A. Shen, Z. Besch, B.M. Nelson, K. Bernstein, P.S.	

Valmalette, Jean-Christophe **For a** 30 minute talk	A FIRST EVIDENCE OF CAPTURE OF LIGHT AND ATP SYNTHESIS BY INSECT
Session: Photochemistry, Photophysics, and Photosynthesis II	**Scheduled for:** Friday, July 4
Authors: Valmalette J. C. Dombrovsky A. Brat P. Mertz C. Capovilla M. Robichon A.	

Victoria, Claudia **For a** Poster	IN VITRO MICELLARIZATION OF FREE AND ESTERIFIED PIGMENTS FROM JALAPEÑO PEPPERS AT INTERMEDIATE RIPENING STAGES: THE EFFECT OF COMPLEX FOOD MATRICES
Session:	**Scheduled for:**
Authors: Victoria-Campos, C. I. Ornelas-Paz, J. de J.	

Von Lintig, Johannes **For a** 30 minute talk	Symmetric versus eccentric cleavage of pro-vitamin A carotenoids in mammalian physiology
Session: Carotenoid Metabolism and Function I	**Scheduled for:** Tuesday, July 1
Authors: von Lintig, J. Palczewski, G. Widjaja-Adhi, N.A. Babino, D. Amengual, A.	

Von Oppen-Bezalel, Liki **For a** Poster	THE PHOTOPROTECTIVE AND SKIN LIGHTENING EFFECTS OF A FOOD SUPPLEMENT TOMATO POWDER RICH IN PHYTOENE AND PHYTOFLUENE, THE COLORLESS CAROTENOIDS
Session:	**Scheduled for:**
Authors: von Oppen-Bezalel, L. Havas, F. Fishbein, D. Ben-Chitrit, O. Baron, A.	

Wang, Xiang-Dong **For a** Plenary	CAROTENOIDS AND CHRONIC DIESEASE PREVENTION VIA THE INTERACTION WITH SIRT1
Session: Chronic Disease Prevention and Treatment	**Scheduled for:** Monday, June 30
Authors: Wang, X.D.	

Wang, Xiang-Dong **For a** Poster	THE EFFECT OF LYCOPENE SUPPLEMENTATION ON TOBACCO CARCINOGEN INDUCED HEPATIC CYP2E1 EXPRESSION, STEATOHEPATITIS AND HEPATOCELLULAR CARCINOMAS IN FERRETS
Session:	**Scheduled for:**
Authors: Wang, X.D. Aizawa, K Liu, C. Veeramachaneni, S Hu, K.Q. Smith, D.E.	

White, Wendy **For a** Poster	Soybean Oil in Salad Dressing and Bioavailability of Fat-soluble Micronutrients in Salads: a Dose-Response Study
Session:	**Scheduled for:**
Authors: White, W.S. Zhou, Y. Agustiana, A. Quadt, F. Dixon, P. Flendrig, L.	

Widjaja-Adhi, Ni Made Airanthi K. **For a** 15 minute talk	MOLECULAR COMPONENTS CONTROLLING CAROTENOID HOMEOSTASIS IN MAMMALS
Session: Carotenoid Metabolism and Function I	**Scheduled for:** Tuesday, July 1
Authors: Widjaja-Adhi, N.M.A.K. Lobo, G.P. von Lintig, J.	

Wijaya, Wahyu **For a** Poster	Stability of carotenoids in the crude extract of Rhodopseudomonas palustris
Session:	**Scheduled for:**
Authors: Wijaya, W. Prasetyo, B. Limantara, L.	

Wuestenberg, Bettina **For a** 30 minute talk	Large Scale Production of Carotenoids
Session: Chemical Synthesis, Analysis, and Industrial Production II	**Scheduled for:** Wednesday, July 2
Authors: Wuestenberg, B Bonrath, W. Hitzfeld, A. Medlock, J. Mueller, T. Schaefer, C. Schierle, J.	

Wurtzel, Eleanore **For a** Plenary	ENGINEERING CAROTENOIDS: A MULTI-DIMENSIONAL PUZZLE YET TO BE SOLVED.
Session: Biosynthesis and Metabolism	**Scheduled for:** Thursday, July 3
Authors: Eleanore T. Wurtzel Maria Shumskaya Jesús Beltrán Xiaoling Yao	

Yamano, Nami **For a** Poster	PHOTOSYNTHETIC PIGMENTS BOUND TO THE PIGMENT-PROTEIN COMPLEX IN ASTAXANTHIN PRODUCING LETTUCE
Session:	**Scheduled for:**
Authors: Yamano N Fujii R Ifuku K Misawa N Hashimoto H	

Yamashita, Eiji **For a** Poster	BEAUTY SCIENCE BY ASTAXANTHIN INSIDE-OUT & OUTSIDE-IN TREATMENT.
Session:	**Scheduled for:**
Authors: Yamashita, E Hongo, N Tominaga, K	

Yatsunami, Rie **For a** Poster	ANALYSIS OF THREE GENES FOR BACTERIORUBERIN BIOSYNTHESIS IN EXTREMELY HALOPHILIC ARCHAEON Haloarcula japonica
Session:	**Scheduled for:**
Authors: Yatsunami, R. Yang, Y. Ando, A. Miyoko, N. Takaichi, S. Nakamura, S	

Yoshizawa, Masayuki **For a** 15 minute talk	DYNAMICS IN LH1 COMPLEXES STUDIED BY REPUMP OF THE DARK EXCITED STATES OF CAROTENOID
Session: Photochemistry, Photophysics, and Photosynthesis I	**Scheduled for:** Monday, June 30
Authors: Sobue, K. Yoshimatsu, O. Abe, K. Sakai, S. Nango, M. Hashimoto, H. Yoshizawa, M.	

You, Hong **For a** 15 minute talk	Quantifying the Provitamin A Value of Beta-carotene-biofortified Sorghum
Session: Food and Biotechnology I	**Scheduled for:** Thursday, July 3
Authors: You, H. Zhang, Y. Zhao, Z-Y. Che, P. Albertsen, M.C. Glassman, K. White, W.S.	