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6th COSTAM/SFRR (ASEAN/Malaysia) International Workshop on Micronutrients, Oxidative Stress, and the Environment

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ABSTRACT

The 6th COSTAM/SFRR (ASEAN/Malaysia) workshop, "Micronutrients, Oxidative Stress, and the Environment," was held from June 29 to July 2 at Holiday Inn Damai Beach Resort in Kuching, Sarawak. Two hundred twenty participants from 17 countries presented recent advances on natural antioxidants in the area of oxidative stress and molecular aspects of nutrition. Natural products and research are an important program in academic institutions and are experiencing unprecedented interest and growth by the scientific community and public health authorities. Progress is being driven by better understanding of the molecular mechanisms of the relation between oxidative stress and micronutrient action. The gathering of scientists from around the world was fruitful, and we hope that future work will be developed by the formal and informal interactions that took place in this beautiful tropical setting. *Antioxid. Redox Signal.* 8, 2175–2177.

The international workshop, the sixth in a series of such workshops since 1991, was held from June 29 to July 2 at the Holiday Inn Damai Beach Resort, Kuching, Sarawak. This workshop served as a venue for scientists from 17 countries in which 220 participants presented recent advances in natural antioxidants in the area of oxidative stress and molecular aspects of nutrition. The four scientific sessions were on tocols, flavonoids, carotenoids, and oxidant signaling, and an active Poster Session (79 posters) featured these topics. Speakers came from all continents, and the organizers can be congratulated for an interesting program. The Steering Committee had two Co-Chairmen, Dr. Augustine S.H. Ong (Malaysia), and Dr. Lester Packer (United States), and Dr. Kalanithi Nesaretnam (Malaysia) as Secretary General, as well as an international group of advisors. COSTAM is the Confederation of Scientific and Technological Associations in Malaysia, and the Chief Minister of Sarawak made a special effort to support the workshop in several ways. The Society for Free Radical Research (SFRR), as a global organization, was pleased to have the ASEAN/Malaysian colleagues as active as they were.

The workshop was scientifically opened with two Keynote Lectures, relating to the first two sessions of the meeting. Etsuo Niki (NAIST, Osaka, Japan) gave an overview on current research on tocotrienols, with emphasis on ongoing research in Japan. Tocotrienols are contained in palm oil as a major source, and much interest is expressed in biologic, nutritional, and even clinical aspects of tocotrienols. The second Keynote Lecture was delivered by Gary Williamson (Nestle Research Center, Lausanne, Switzerland) on the topic of bioavailability and absorption of flavonoids. With the many nutritional sources of flavonoids, it is important to follow the uptake and metabolism of individual compounds in the organism. Gut metabolism and transport systems are major topics, and the role of certain metabolites and breakdown products can now be addressed.

SESSION I: TOCOLS

Chandan Sen (Ohio State University, Columbus, Ohio, U.S.A.) opened this session with a lecture entitled "The Case

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for α-Tocotrienol against Stroke," an eye-opener on the unexpected potential functions, particularly with regard to effects on 12-lipoxygenase. Jeffrey Atkinson (Brock University, Ontario, Canada) underlined the particular physical chemistry of tocotrienols that may explain the noted differences between the tocopherols and the tocotrienols, an interesting topic for further analysis; his buzzword: "a curious curve." Antiatherogenic and antiinflammatory properties were addressed by Toshikazu Yoshikawa (Kyoto Prefectural University, Kyoto, Japan) and by Bharat Aggarwal (M.D. Anderson Cancer Center, Houston, Texas, U.S.A.), respectively, and by William Stone (E. Tennessee State University, U.S.A.) with focus on prostate cancer.

More lectures in this session went into special systems of disease [*e.g.*, angiogenesis (Teruo Miyazawa, Tohoku University, Tohoku, Japan), gastritis (Nafeeza Ismail, University MARA, Malaysia), central nervous system (Musalmea Mazlan, University Kebangsaan, Malaysia), atherosclerosis (Nezrin Ozer, Istanbul, Turkey), tocotrienols as adjuvants in developing cancer vaccines (Kalanithi Nesaretnam, Malaysian Palm Oil Board, Malaysia), and preeclampsia (Mohd Mutalib, International Islamic University, Malaysia)].

Thus, a wide range of pathophysiologic applications was considered, as it was in the related posters. The focus of future research on tocotrienols was shaped by extended discussions.

SESSION II: FLAVONOIDS

This rapidly expanding field was covered by talks on endothelial dysfunction in humans, comparing high-flavanol and low-flavanol cocoa (Helmut Sies, Dusseldorf, Germany), flavonoid metabolism (Claudine Manach, INRA, Clermont-Ferrand, France), and on potential antihypertensive effects (Cesar Fraga, University of California at Davis, Davis, California, U.S.A.). Further topics were the regulation of NF-κB (Patricia Oteiza, also from U.C. Davis), on antioxidant effects from Indian plants (Paul Devasagayam, BARC, Mumbai, India), and on protective effects related to the G6PD status (Daniel Chiu, Chang Gung University, Taiwan).

Clearly, much is yet to be learned about the many potentially interesting points of action of flavonoids. "The Next Horizon for Dietary Cancer Chemoprevention" was addressed by Roderick Dashwood (Linus Pauling Institute, Corvallis, Oregon, U.S.A.), and dietary strategies regarding prostate cancer prevention by Emily Ho (also from the LPI). Tony Kong (Rutgers University, Piscataway, New Jersey, U.S.A.) exposed current knowledge on pharmacogenomics and toxicogenomics in terms of chemoprevention.

Alan Crozier and Serena Marks (University of Glasgow, Glasgow, U.K.) presented work on flavan-3-ols and on cider phenolics; Lindsay Brown (University of Queensland, Brisbane, Australia) described experimental systems on cardiovascular effects of resveratrol; and Michael Mathai (Howard Florey Institute, Melbourne, Australia) considered tea effects on glucose tolerance. The following plant extract studies were presented: Papaya (by Umak Kuppusamy, University Malaya, Malaysia), Chlorella (Yasmin Yusof, University Kebangsaan, Malaysia), *Piper betle* (Sudipto Ganguly, Pharmacology, Kolkata, India), and garlic (Hye-Kyung Na, Seoul National University, Seoul, South Korea).

SESSION III: CAROTENOIDS

Cancer chemoprevention, with emphasis on cell–cell communication, was the topic of the talk by John Bertram (University of Hawaii, Hawaii, U.S.A.), and the role of carotenoid breakdown products was addressed by Werner Siems (Bad Harzburg, Germany). Masayasu Inoue (Osaka City University, Osaka, Japan) made the connection between redox status and stress, and Yuji Naito (Kyoto Prefectural University, Kyoto, Japan) focused on astaxanthin effects in renal mesangial cells. Olaf Sommerburg (University of Heidelberg, Heidelberg, Germany) assessed the clinical need for carotenoid supplementation, and Vasantha Kumar (Kuantan Hospital, Malaysia) considered macular degeneration, whereas Ong Choon Nam (National University of Singapore) focused on hepatocellular carcinoma.

Worldwide research on carotenoids continues to unravel new aspects, and particular organ sites unexpectedly come into focus, opening exciting further perspectives.

SESSION IV: OXIDANT SIGNALING

Nick Hunt (University of Sydney, Australia) talked on Redox Regulation of Gene Expression in T-cell Activation, and Enrique Cadenas (University of Southern California, Los Angeles, California, U.S.A.) presented aspects of translocation of JNK to mitochondria. Young-Joon Surh (Seoul National University, Seoul, Korea) connected signaling with cytoprotection and chemoprevention, and Dipak Das (University of Connecticut, Farmington, Connecticut, U.S.A.) considered signaling in the ischemic myocardium. The session was concluded with talks by Salmaan Hussain (University Kebangsaan, Malaysia) on hydroquinone-induced apoptosis, by Matt Whiteman (National University of Singapore) on chlorinative stress and cell-death signaling, and by Tsan-Zon Liu (Chang Gung University, Taiwan) on folate deficiency.

Although signaling was a matter considered in other sessions as well, this final session showed the intricate role of subcellular and intercellular information pathways executed by special signaling molecules and their orchestrated action.

An active poster session was held, with 79 posters being displayed over the 3-day conference. Poster prizes, which came with a cash prize of RM 200, were awarded to the following five candidates:

(a) Kanga Rani Selvaduray (Malaysian Palm Oil Board): Antiangiogenic effect of palm tocotrienols, (b) Rita H.L. Ling (University of Malaya): Prooxidant state and antioxidant status of β-thalassemia major patients attending the University Malaya Medical Center, (c) Sammer Sharma (Panjab University, India): Effect of insulin and its combination with resveratrol and curcumin in attenuation of diabetic neuropathic

pain: participation of nitric oxide and TNF-α, (d) Juliana MJ (University Putra, Malaysia): The antihypertensive activity of oil palm frond (*Elaeis guineensis*) methanolic extract in rats with endothelial dysfunction, and (e) Mukhrizah Othman (Malaysian Palm Oil Board): Proteomic analyses of MCF-7 human breast cancer cells supplemented with vitamin E and anthocyanins

All in all, the gathering of scientists from around the world was fruitful, and we now can hope that future work in these topics will have been helped by these formal and informal interactions.

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