OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

NUTRITION AND REDOX BIOLOGY IN DEVELOPMENT AND HEALTH

PROGRAM

7-10 MAY 2014
UNIVERSITY OF CALIFORNIA DAVIS CONFERENCE CENTER
DAVIS, CALIFORNIA
OXIDANTS AND ANTIOXIDANTS IN BIOLOGY
NUTRITION AND REDOX BIOLOGY IN DEVELOPMENT AND HEALTH
7-10 MAY 2014
UNIVERSITY OF CALIFORNIA DAVIS CONFERENCE CENTER
– CONFERENCE CO-SPONSORED BY THE LINUS PAULING INSTITUTE –

CONFERENCE ORGANIZERS

Maret G. Traber – OCC President
SCHOOL OF BIOLOGICAL AND POPULATION HEALTH SCIENCES,
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OREGON, USA

Patricia Oteiza
DEPARTMENT OF NUTRITION, UNIVERSITY OF CALIFORNIA, DAVIS, CALIFORNIA, USA

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HEINRICH-HEINE-UNIVERSITY DUSSELDORF, DUSSELDORF, GERMANY

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DSM NUTRITIONAL PRODUCTS, BASEL, SWITZERLAND

César G. Fraga
PHYSICAL CHEMISTRY, SCHOOL OF PHARMACY AND BIOCHEMISTRY,
UNIVERSITY OF BUENOS AIRES, IBIMOL, UBA-CONICET, BUENOS AIRES, ARGENTINA

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DEPARTMENT OF INTERNATIONAL HEALTH, JOHNS HOPKINS BLOOMBERG
SCHOOL OF PUBLIC HEALTH, BALTIMORE, USA

Lester Packer
PHARMACOLOGY & PHARMACEUTICAL SCIENCES, SCHOOL OF PHARMACY,
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA, USA
10:00 – 02:00  REGISTRATION

02:00 – 02:15  WELCOME

Maret G. Traber
School of Biological and Population Health Sciences, Linus Pauling Institute, Oregon State University, Corvallis, Oregon, USA

Patricia Oteiza
Department of Nutrition, University of California, Davis, California, USA

Francene M. Steinberg
Department of Nutrition, University of California, Davis, California, USA
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<tr>
<th>TIME</th>
<th>SESSION TOPIC</th>
<th>SPEAKER</th>
<th>INSTITUTION</th>
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<tr>
<td>02:15 – 02:30</td>
<td>The first 1000 days – Introductory remarks</td>
<td>Christine P. Stewart</td>
<td>Program in International and Community Nutrition, Department of Nutrition, University of California, Davis, California, USA</td>
</tr>
<tr>
<td>02:30 – 03:00</td>
<td>Gut microbiota: nutritionally and environmentally sensitive ecosystems that influence the host biology</td>
<td>Mark J. Manary</td>
<td>Department of Pediatrics, Washington University in St. Louis, St. Louis, Missouri, USA</td>
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<tr>
<td>03:00 – 03:30</td>
<td>The damaged gut: enteropathy, enteric infection, and malnutrition</td>
<td>Audrie Lin</td>
<td>Division of Epidemiology, School of Public Health, University of California, Berkeley, California, USA</td>
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<tr>
<td>03:30 – 04:00</td>
<td>Early nutrition: consequences for the immune system</td>
<td>Charles Stephensen</td>
<td>USDA-Agricultural Research Service Western Human Nutrition Research Center, University of California, Davis, California, USA</td>
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</table>
04:00 – 04:30  Coffee break

04:30 – 05:00  Developmental programming for obesity: epigenetic modifications in the hypothalamus

  Mulchand Patel

  Department of Biochemistry, School of Medicine and Biomedical Sciences, University at Buffalo, The State University of New York, Buffalo, New York, USA

05:00 – 05:30  Hormonal regulation of infant and child growth

  Morey W. Haymond

  Department of Pediatrics, Section of Diabetes and Endocrinology, Texas Children’s Hospital and Children’s Nutrition Research Center, Baylor College of Medicine, Houston, Texas, USA

05:30 – 06:00  Carotenoid and retinoid metabolism in early development: Priming of metabolic disease?

  Johannes von Lintig

  Department of Pharmacology, Case Western Reserve University, School of Medicine, Cleveland, Ohio, USA

06:00 – 06:30  Integration of basic biology and public health research: bringing research disciplines together

  Lindsay H. Allen

  USDA, ARS-Western Human Nutrition Research Center, Davis, and Program in International and Community Nutrition, University of California, Davis, California, USA

07:00  Welcome Reception
## Session II  Flavonoids: From Metabolism to Dietary Guidelines

**Chairpersons**  
*César G. Fraga*  
*Physical Chemistry, School of Pharmacy and Biochemistry, University of Buenos Aires, IBIMOL, UBA-CONICET, Buenos Aires, Argentina*  

*Carl L. Keen*  
*Department of Nutrition, University of California, Davis, California, USA*

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<tr>
<td>09:00 – 09:30</td>
<td><a href="-">2-14C</a>-Epicatechin metabolomics: absorption and metabolism in the small intestine and colon</td>
<td><em>Alan Crozier</em></td>
<td><em>School of Medicine, College of Medical, Veterinary and Life Sciences, University of Glasgow, UK</em></td>
</tr>
<tr>
<td>09:30 – 10:00</td>
<td>miRNA as molecular targets of flavonoid metabolites involved in preservation of endothelial cell function</td>
<td><em>Dragan Milenkovic</em></td>
<td><em>INRA, Clermont Université, Université D'Auvergne, Unité de Nutrition Humaine, Clermont-Ferrand, France</em></td>
</tr>
<tr>
<td>10:00 – 10:30</td>
<td>Flavanols and cardiovascular health: clinical outcomes of the FLAVIOLA project (Seventh Framework Programme of the European Commission)</td>
<td><em>Christian Heiss</em></td>
<td><em>Division of Cardiology, Pulmonology, and Vascular Medicine, Düsseldorf University Hospital, Düsseldorf, Germany</em></td>
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<tr>
<td>10:30 – 11:00</td>
<td>Coffee break</td>
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<td>11:00 – 11:30</td>
<td>Anthocyanin intake and the risk of cardiovascular disease</td>
<td><em>Aedin Cassidy</em></td>
<td><em>Department of Nutrition, Norwich Medical School, University of East Anglia, Norwich, UK</em></td>
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11:30 – 12:00  Flavonoids improve spatial memory performance and increase hippocampal brain-derived neurotrophic factor
Jeremy P. Spencer
Molecular Nutrition Group, School of Chemistry, Food and Pharmacy, University of Reading, Reading, UK

12:00 – 12:30  Dietary guidelines on Flavonoids? Where are we today?
Joanne R. Lupton
Department of Nutrition and Food Science, Texas A&M University, College Station, Texas, USA

12:30 – 01:30  Lunch

01:30 – 02:00  Hydroxytyrosol is a rising star of nutraceuticals after resveratrol on targeting mitochondria to prevent age-associated diseases
Jiankang Liu
Center for Mitochondrial Biology and Medicine, The Key Laboratory of Biomedical Information Engineering of Ministry of Education, School of Life Science and Technology and Frontier Institute of Science and Technology, Xian Jiaotong University, Xi’an, China

02:00 – 02:30  Pomegranate consumption, the microbiome, and urolithin production
Zhaoping Li
Division of Clinical Nutrition, Department of Medicine, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, California, USA
02:30 – 03:30  **ROUND TABLE DISCUSSION**

**MICRONUTRIENTS: THE FIRST 1000 DAYS**

**COORDINATORS**

Christine P. Stewart  
Lindsay H. Allen

**PANEL MEMBERS**

Morey W. Haymond  
Klaus Kraemer  
Mark J. Mannary  
Mulchand Patel

03:30 – 04:00  *Coffee break*
# ORAL PRESENTATIONS FROM SELECTED POSTERS

**Chairpersons**  
*Josiane Cillard*  
**Cellular and Molecular Biology, Faculty of Pharmacy, University of Rennes 1, Rennes, France**

*Nesrin Özer*  
**Department of Biochemistry, Faculty of Medicine, Genetic and Metabolic Diseases Research Center, Marmara University, Istanbul, Turkey**

*John Maguire*

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<tr>
<td>04:00 – 04:20</td>
<td>The metabolic triad in brain aging: Mitochondria, insulin/IGF-1 signaling, and JNK signaling</td>
<td><em>Fei Yin</em></td>
<td><strong>Pharmacology &amp; Pharmaceutical Sciences, School of Pharmacy, University of Southern California, Los Angeles, California, USA</strong></td>
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<tr>
<td>04:20 – 04:40</td>
<td>Mitochondrial localized STAT3 modulates reactive oxygen species and apoptotic cell death in pancreatic cancer</td>
<td><em>Gerardo G. Mackenzie</em></td>
<td><strong>Department of Preventive Medicine, Stony Brook Cancer Center, Stony Brook University, Stony Brook, New York, USA</strong></td>
</tr>
<tr>
<td>04:40 – 05:00</td>
<td>Progressive alterations in brain bioenergetic system during female reproductive aging: Implications for risk identification and disease prevention</td>
<td><em>Jia Yao</em></td>
<td><strong>Pharmacology &amp; Pharmaceutical Sciences, School of Pharmacy, University of Southern California, Los Angeles, California, USA</strong></td>
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</table>
05:00 – 05:20  Nitric oxide promotes insulin responsiveness in endothelium through S-nitrosylation and inactivation of protein phosphatase PTP1B

*Tzu-Ching Meng*

*Institute of Biological Chemistry, Academia Sinica, Taipei, Taiwan and Institute of Biochemical Sciences, College of Life Sciences, National Taiwan University, Taipei, Taiwan*

05:20 – 05:40  SHC depletion stimulates brown fat activity *in-vivo* and *in-vitro*

*Alexey Tomilov*

*Department of Molecular Biosciences, University of California Davis, Davis, California, USA*

05:40 – 06:00  NADPH oxidase-mediated ROS in inactivation of Toll-like receptors: a positive feedback regulator?

*Daniel Hwang*

*Western Human Nutrition Research Center, ARS/USDA and Department of Nutrition, University of California Davis, Davis, California, USA*

06:00 – 08:00  *Poster Viewing and Refreshments*
## SESSION III
### REDOX SIGNALING AND SYSTEMS BIOLOGY IN HEALTH

**Chairpersons**

*Enrique Cadenas*

Pharmacology & Pharmaceutical Sciences, School of Pharmacy, University of Southern California, Los Angeles, California, USA

*Lester Packer*

Pharmacology & Pharmaceutical Sciences, School of Pharmacy, University of Southern California, Los Angeles, California, USA

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### 09:00 – 09:30

Thiol signaling, redox circuits, and systems biology in health status

*Dean P. Jones*

Department of Medicine, Emory University, Atlanta, Georgia, USA

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### 09:30 – 10:00

Coupling of metabolism to local circadian clock via reversible hyperoxidation of peroxiredoxin III

*Sue Goo Rhee*

Yonsei Biomedical Research Institute, Yonsei University College of Medicine, Seoul, Korea

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### 10:00 – 10:30

Role of selenium and selenoproteins in insulin-regulated energy metabolism

*Holger Steinbrenner*

Institute for Biochemistry and Molecular Biology I, Heinrich-Heine University, Düsseldorf, Germany

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### 10:30 – 11:00

Coffee break

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### 11:00 – 11:30

Brain cholesterol oxidation and 4-hydroxynonenal in the pathogenesis of Alzheimer's disease

*Giuseppe Poli*

Department of Clinical and Biological Sciences, University of Turin, Turin, Italy
11:30 – 12:00 Allopregnanolone as a regenerative and mitochondrial regulator: Therapeutic implications for Alzheimer's disease

Roberta Díaz Brinton
Pharmacology & Pharmaceutical Sciences, School of Pharmacy, University of Southern California, Los Angeles, California, USA

12:00 – 12:30 Fusion and fission: interlinked processes critical for mitochondrial health

David Chan
Division of Biology, California Institute of Technology, Pasadena, California, USA

12:30 – 01:00 Mitochondrial dynamics

Jodi Nunnari
Department of Molecular and Cellular Biology, University of California, Davis, California, USA

01:00 – 02:30 Lunch
CHAIRPERSONS  João Laranjinha
FACULTY OF PHARMACY AND CENTER FOR NEUROSCIENCES AND CELL BIOLOGY, UNIVERSITY OF COIMBRA, COIMBRA, PORTUGAL

Enrique Cadenas
PHARMACOLOGY & PHARMACEUTICAL SCIENCES, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA, USA

02:30 – 03:00  Exercise and mitochondrial dynamic remodeling
Yong Zhang
TIANJIN KEY LABORATORY OF EXERCISE PHYSIOLOGY AND SPORTS MEDICINE, DEPARTMENT OF HEALTH & EXERCISE SCIENCE, TIANJIN UNIVERSITY OF SPORT, TIANJIN, CHINA

03:00 – 03:30  Hypoxia activation of mitophagy
Quan Chen
STATE KEY LABORATORY OF BIOMEMBRANE AND MEMBRANE BIOTECHNOLOGY, INSTITUTE OF ZOOLOGY, CHINESE ACADEMY OF SCIENCES, BEIJING, CHINA

03:30 – 04:00  Measuring and manipulating mitochondrial ROS signals
Michael Murphy
MEDICAL RESEARCH COUNCIL, MITOCHONDRIAL BIOLOGY UNIT, WELLCOME TRUST, CAMBRIDGE, UK

04:00 – 04:30  Metabolomic analyses of mitochondrial metabolism
Oliver Fiehn
DAVIS GENOME CENTER, UNIVERSITY OF CALIFORNIA, DAVIS, CALIFORNIA, USA

04:30 – 05:00  Coffee break
05:00 – 06:00  **ROUND TABLE DISCUSSION**  
**REDOX SIGNALING AND HEALTH**

**COORDINATOR**  *Michael Murphy*

**PANEL MEMBERS**  *Oliver Fiehn*

*Dean P. Jones  
Jodi Nunnari  
Giuseppe Poli  
Sue Goo Rhee  
Oren Tirosh*

06:00 – 07:00  **Poster Viewing and Refreshments**
07:00  CONCERT

08:00  GALA DINNER

PRIZES AND AWARDS

OCC & Jarrow Formulas Health Sciences Prize
Selection Committee
Lester Packer, Jarrow Rogovin, Enrique Cadenas

Science and Humanities Award
Selection committee
Maret G. Traber, Carroll E. Cross, Yuki Hayashi

Young Investigator Awards
Selection committee
Josiane Cillard, Nesrin Özer, John Maguire
Oxygen Club of California
Linus Pauling Institute
Society for Free Radical Research International
Archives Biochemistry & Biophysics – Elsevier

Oxygen Club of California Honorary Awards
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<td>09:00 – 09:30</td>
<td>Session IV</td>
<td>α-Tocotrienol: multimodal protection against stroke</td>
<td>Chandan K. Sen</td>
<td>Department of Surgery, Davis Heart and Lung Research Institute, Ohio State University Wexner Medical Center, Columbus, Ohio, USA</td>
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<tr>
<td>09:30 – 10:00</td>
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<td>Vitamin E and nonalcoholic fatty liver disease</td>
<td>Arun Sanyal</td>
<td>Division of Gastroenterology, Hepatology, and Nutrition, Virginia Commonwealth University School of Medicine, Richmond, Virginia, USA</td>
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<td>10:00 – 10:30</td>
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<td>Isoforms of vitamin E differentially regulate inflammation</td>
<td>Joan M. Cook-Mills</td>
<td>Allergy-Immunology Division, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, USA</td>
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<td>10:30 – 11:00</td>
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<td>Coffee break</td>
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11:00 – 11:30  Anti-inflammatory functions of vitamin E metabolites
Qing Jiang

DEPARTMENT OF FOODS AND NUTRITION, PURDUE UNIVERSITY,
WEST LAFAYETTE, INDIANA, USA

11:30 – 12:00  Vitamin E and apoptosis: free radical scavenging versus
regulation of enzymatic lipid peroxidation.
Valerian Kagan

CENTER FOR FREE RADICAL AND ANTIOXIDANT HEALTH AND DEPARTMENT
OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH, UNIVERSITY OF
PITTSBURGH, PITTSBURGH, PENNSYLVANIA, USA

12:00 – 12:30  The location, activity and behavior of α-tocopherol in
membranes
Jeffrey Atkinson

DEPARTMENT OF CHEMISTRY, BROCK UNIVERSITY, ST. CATHARINES,
ONTARIO, CANADA

12:30 – 01:00  Promotion of plasma membrane repair by vitamin E
Paul L. McNeil

INSTITUTE OF MOLECULAR MEDICINE AND GENETICS, GEORGIA REGENTS
UNIVERSITY, AUGUSTA, GEORGIA, USA

01:00  Farewell Lunch
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