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

Helmut Sies
INSTITUTE OF BIOCHEMISTRY AND MOLECULAR BIOLOGY I,
HEINRICH-HEINE-UNIVERSITY DÜSSELDORF, DÜSSELDORF, GERMANY

SCIENTIFIC ADVISORY COMMITTEE

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

Manfred Eggersdorfer
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

Klaus Kraemer
SIGHT AND LIFE, BASEL, SWITZERLAND
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
# SESSION I

## THE FIRST 1000 DAYS: FROM METABOLIC SIGNAL TO SOCIETAL IMPACT

### CHAIRPERSONS

**Christine P. Stewart**  
Program in International and Community Nutrition, Department of Nutrition, University of California, Davis, California, USA

**Klaus Kraemer**  
Sight and Life, Basel, Switzerland  
Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<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>
</tr>
<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>
</tr>
</tbody>
</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

09:00 – 09:30  [2-14C](–)-Epicatechin metabolomics: absorption and metabolism in the small intestine and colon
Alan Crozier
SCHOOL OF MEDICINE, COLLEGE OF MEDICAL, VETERINARY AND LIFE SCIENCES, UNIVERSITY OF GLASGOW, UK

09:30 – 10:00  miRNA as molecular targets of flavonoid metabolites involved in preservation of endothelial cell function
Dragan Milenkovic
INRA, CLERMONT UNIVERSITÉ, UNIVERSITÉ D'AUVERGNE, UNITÉ DE NUTRITION HUMAINE, CLERMONT-FERRAND, FRANCE

10:00 – 10:30  Flavanols and cardiovascular health: clinical outcomes of the FLAVIOLA project (Seventh Framework Programme of the European Commission)
Christian Heiss
DIVISION OF CARDIOLOGY, PULMONOLOGY, AND VASCULAR MEDICINE,
DÜSSELDORF UNIVERSITY HOSPITAL, DÜSSELDORF, GERMANY

10:30 – 11:00  Coffee break

11:00 – 11:30  Anthocyanin intake and the risk of cardiovascular disease
Aedin Cassidy
DEPARTMENT OF NUTRITION, NORWICH MEDICAL SCHOOL, UNIVERSITY OF EAST ANGLIA, NORWICH, UK
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, Xi’an 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

04:00 – 04:20  The metabolic triad in brain aging: Mitochondria, insulin/IGF-1 signaling, and JNK signaling
  Fei Yin
  PHARMACOLOGY & PHARMACEUTICAL SCIENCES, SCHOOL OF PHARMACY,
  UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA, USA

04:20 – 04:40  Mitochondrial localized STAT3 modulates reactive oxygen species and apoptotic cell death in pancreatic cancer
  Gerardo G. Mackenzie
  DEPARTMENT OF PREVENTIVE MEDICINE, STONY BROOK CANCER CENTER,
  STONY BROOK UNIVERSITY, STONY BROOK, NEW YORK, USA

04:40 – 05:00  Progressive alterations in brain bioenergetic system during female reproductive aging: Implications for risk identification and disease prevention
  Jia Yao
  PHARMACOLOGY & PHARMACEUTICAL SCIENCES, SCHOOL OF PHARMACY,
  UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA, USA
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*
FRIDAY
MAY 9
# 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  

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 – 09:30</td>
<td>Thiol signaling, redox circuits, and systems biology in health status</td>
<td><em>Dean P. Jones</em></td>
<td>Department of Medicine, Emory University, Atlanta, Georgia, USA</td>
</tr>
<tr>
<td>09:30 – 10:00</td>
<td>Coupling of metabolism to local circadian clock via reversible hyperoxidation of peroxiredoxin III</td>
<td><em>Sue Goo Rhee</em></td>
<td>Yonsei Biomedical Research Institute, Yonsei University College of Medicine, Seoul, Korea</td>
</tr>
<tr>
<td>10:00 – 10:30</td>
<td>Role of selenium and selenoproteins in insulin-regulated energy metabolism</td>
<td><em>Holger Steinbrenner</em></td>
<td>Institute for Biochemistry and Molecular Biology I, Heinrich-Heine University, Düsseldorf, Germany</td>
</tr>
<tr>
<td>10:30 – 11:00</td>
<td>Coffee break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 – 11:30</td>
<td>Brain cholesterol oxidation and 4-hydroxynonenal in the pathogenesis of Alzheimer's disease</td>
<td><em>Giuseppe Poli</em></td>
<td>Department of Clinical and Biological Sciences, University of Turin, Turin, Italy</td>
</tr>
</tbody>
</table>

14
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
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 – 09:30</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>
</tr>
<tr>
<td>09:30 – 10:00</td>
<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>
</tr>
<tr>
<td>10:00 – 10:30</td>
<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>
</tr>
<tr>
<td>10:30 – 11:00</td>
<td>Coffee break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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
SPONSORS

Oxyen Club of California / Linus Pauling Institute
Conference Endowment Fund
NuSkin / Pharmanex Research Institute
DSM Nutritional Products
Sight & Life
Osato Research Institute

Bayer Consumer Care AG
Herbalife Nutrition Institute
Mars Inc.
Nutrilite Health Institute
Pharmavite
POM Wonderful
USANA Health Sciences

Beijing Huawei Scientific Instruments Co., Ltd
BioMarker Pharmaceuticals
Elsevier
Ocean Spray Cranberries Inc.
Shaklee Corporation
Society for Free Radical Research International
Taylor & Francis