



# OXYGEN CLUB OF CALIFORNIA

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*2010*

## OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

*TRANSLATIONAL REDOX SCIENCE*

CO-SPONSORED BY THE  
LINUS PAULING INSTITUTE

### PROGRAM

17-20 MARCH 2010  
FESS PARKER'S DOUBLETREE RESORT  
SANTA BARBARA, CALIFORNIA

**OXIDANTS AND ANTIOXIDANTS IN BIOLOGY**  
**TRANSLATIONAL REDOX SCIENCE**  
17-20 MARCH 2010  
SANTA BARBARA, CALIFORNIA

CONFERENCE  
ORGANIZERS

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*Chandan K. Sen*  
*Enrique Cadenas*  
*Dipak K. Das*  
*César G. Fraga*  
*John Maguire*  
*Lester Packer*  
*Junji Yodoi*

SCIENTIFIC PROGRAM  
ORGANIZERS

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*Bruce N. Ames*  
*Dipak K. Das*  
*César G. Fraga*  
*Thomas K. Hunt*  
*Klaus Kraemer*  
*Periannan Kuppusamy*  
*Lester Packer*  
*Chandan K. Sen*  
*Helmut Sies*  
*Roland Stocker*  
*Hideo Utsumi*  
*José Viña*  
*Junji Yodoi*

**WEDNESDAY**  
**MARCH 17**

05:45

**WELCOME**

*Chandan K. Sen*

PRESIDENT OF THE OXYGEN CLUB OF CALIFORNIA  
THE OHIO STATE UNIVERSITY MEDICAL CENTER

**KEYNOTE LECTURES**

**THE 2008 NOBEL PRIZES IN PHYSIOLOGY OR MEDICINE**

SPONSORED BY IMMUN'AGE

06:00–06:45

CHAIRPERSON

*Helmut Sies*

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

Novel infectious agents in human carcinogenesis:

State and perspectives

*Harald zur Hausen*

DEUTSCHES KREBSFORSCHUNGSZENTRUM, HEIDELBERG, GERMANY

06:45–07:30

CHAIRPERSON

*Lester Packer*

DEPARTMENT OF PHARMACOLOGY & PHARMACEUTICAL SCIENCES,  
SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA,  
LOS ANGELES, CA, USA

New horizons in HIV/AIDS

*Luc Montagnier*

WORLD FOUNDATION AIDS RESEARCH & PREVENTION, UNESCO, PARIS,  
FRANCE

07:30

**WELCOME RECEPTION**

**THURSDAY  
MARCH 18**

**SESSION I WOUND HEALING**

In the United States, chronic wounds affect around 6.5 million patients. It is claimed that an excess of US\$25 billion is spent annually on treatment of chronic wounds and the burden is growing rapidly due to increasing health care costs, an aging population, and a sharp rise in the incidence of diabetes and obesity worldwide. Ischemia is one of the most common complications adversely affecting wound healing. The session on wound healing will address current advances in basic sciences and how such sciences are being applied to manage wound care clinically. Stem cell biology, inflammation, and ischemic wounds are in focus.

**CHAIRPERSONS Chandan K. Sen**

COMPREHENSIVE WOUND CENTER, DEPARTMENT OF SURGERY, DAVIS HEART & LUNG RESEARCH INSTITUTE, THE OHIO STATE UNIVERSITY MEDICAL CENTER, COLUMBUS, OH, USA

**Thomas K. Hunt**

WOUND HEALING LABORATORY, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, CA, USA

**08:00–08:30 Homing to hypoxia: The role of oxygen tension in progenitor cell trafficking to sites of injury**

**Geoffrey C. Gurtner**

DEPARTMENT OF SURGERY, STANFORD UNIVERSITY SCHOOL OF MEDICINE, STANFORD, CA, USA

**08:30–09:00 Hyperbaric oxygen therapy and stem cell response in wound healing**

**Omaida Velazquez**

THE DEWITT DAUGHTRY FAMILY DEPARTMENT OF SURGERY, LEONARD M. MILLER SCHOOL OF MEDICINE, UNIVERSITY OF MIAMI, MIAMI, FL, USA

**09:00–09:30 Impaired resolution of wound in diabetes**

**Sashwati Roy**

COMPREHENSIVE WOUND CENTER, DEPARTMENT OF SURGERY, DAVIS HEART & LUNG RESEARCH INSTITUTE, THE OHIO STATE UNIVERSITY MEDICAL CENTER, COLUMBUS, OH, USA

**09:30–10:00 Mathematical modeling of the role of oxygen in non-ischemic and ischemic wound healing**

**Avner Friedman**

MATHEMATICAL BIOSCIENCE INSTITUTE, OHIO STATE UNIVERSITY, COLUMBUS, OH, USA

**10:00–10:30 Coffee break**

**10:30–11:00 Cell-based therapies for peripheral vascular disease**

**Douglas Losordo**

FEINBERG CARDIOVASCULAR RESEARCH INSTITUTE, NORTHWESTERN UNIVERSITY, FEINBERG SCHOOL OF MEDICINE, CHICAGO, IL, USA

**11:00–11:30 Ischemic wound healing**

**Thomas Mustoe**

DIVISION OF PLASTIC AND RECONSTRUCTIVE SURGERY, DEPARTMENT OF SURGERY, NORTHWESTERN UNIVERSITY FEINBERG SCHOOL OF MEDICINE, CHICAGO, IL, USA

**11:30–12:00 A novel role for caspase-8 in regulating the cutaneous wound -healing response**

**Colin Jamora**

CELL AND DEVELOPMENTAL BIOLOGY, DIVISION OF BIOLOGICAL SCIENCES UNIVERSITY OF CALIFORNIA AT SAN DIEGO, LA JOLLA, CA, USA

**12:00–12:30 Microcirculation in tissue injury and repair**

**Mark G. Clemens**

DEPARTMENT OF BIOLOGY, UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE, CHARLOTTE, NC, USA

**12:30–02:00 Group Photo and Lunch**

## SESSION II REDOX SIGNALING AND INFLAMMATION

CHAIRPERSONS *Junji Yodoi*

INSTITUTE FOR VIRUS RESEARCH, BIOLOGICAL RESPONSES DEPARTMENT,  
UNIVERSITY OF KYOTO, KYOTO, JAPAN

*Elias Arnér*

DIVISION OF BIOCHEMISTRY, DEPARTMENT OF MEDICAL BIOCHEMISTRY AND  
BIOPHYSICS, KAROLINSKA INSTITUTE, STOCKHOLM, SWEDEN

02:00 – 02:30 Redox regulation of thioredoxin and glutaredoxin  
systems

*Arne Holmgren*

DIVISION OF BIOCHEMISTRY, DEPARTMENT OF MEDICAL BIOCHEMISTRY AND  
BIOPHYSICS, KAROLINSKA INSTITUTE, STOCKHOLM, SWEDEN

02:30 – 03:00 Inactivation of peroxiredoxin I by tyrosine  
phosphorylation at lipid rafts allows spatially controlled  
accumulation of H<sub>2</sub>O<sub>2</sub> for intracellular signaling by growth  
factor or immune receptors

*Sue-Goo Rhee*

DIVISION OF LIFE AND PHARMACEUTICAL SCIENCES, EWHA WOMANS  
UNIVERSITY, SEOUL, SOUTH KOREA

03:00 – 03:30 Thioredoxin and Thioredoxin-Binding Protein-2 (TBP-2)  
in redox signaling

*Junji Yodoi*

INSTITUTE FOR VIRUS RESEARCH, BIOLOGICAL RESPONSES DEPARTMENT,  
UNIVERSITY OF KYOTO, KYOTO, JAPAN

03:30 – 04:00 Immunoregulatory role of GIF/MIF, a redox-geared  
cytokine

*Katsuji Sugie*

DIVISION OF DEVELOPMENTAL IMMUNOLOGY, LA JOLLA INSTITUTE FOR  
ALLERGY AND IMMUNOLOGY, LA JOLLA, CA, USA

04:00 – 04:30 NADPH oxidases in the lung: beyond host defense  
*Albert van der Vliet*

DEPARTMENT OF PATHOLOGY, UNIVERSITY OF VERMONT COLLEGE OF  
MEDICINE, BURLINGTON, VT, USA

04:30 – 05:00 Regeneration of infarcted myocardium with nutritionally  
modified cardiac stem cells: Implication for redox  
signaling

*Dipak K. Das*

CARDIOVASCULAR RESEARCH CENTER, UNIVERSITY OF CONNECTICUT  
SCHOOL OF MEDICINE, FARMINGTON, CT, USA

05:00 – 05:30 Mitochondria, oxidative stress, and cell death  
*Sten Orrenius*

DIVISION OF TOXICOLOGY, INSTITUTE OF ENVIRONMENTAL MEDICINE,  
KAROLINSKA INSTITUTE, STOCKHOLM, SWEDEN

05:30 – 06:00 Non-invasive monitoring of redox status in mice with  
dextran sodium sulphate-induced colitis

*Hideo Utsumi*

DEPARTMENT OF BIO-FUNCTIONAL SCIENCE, FACULTY OF PHARMACEUTICAL  
SCIENCES, KYUSHU UNIVERSITY, FUKUOKA, JAPAN

06:00 – 06:30 Lipoic acid reverses the age-related loss of Nrf2-mediated  
antioxidant gene transcription

*Tory Hagen*

LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR, USA

06:30 *Poster Presentations and Refreshments – All aboard please*

*Free Evening*

**FRIDAY**  
**MARCH 19**

SESSION III    CARDIOVASCULAR

Cardiovascular disease is a worldwide, major cause of death: this session provides an update of already established and new therapeutic approaches that target the cell redox status and can be used for treating cardiovascular disease with diabetic and atherosclerotic components.

CHAIRPERSONS *Dipak K. Das*

CARDIOVASCULAR RESEARCH CENTER, UNIVERSITY OF CONNECTICUT  
SCHOOL OF MEDICINE, FARMINGTON, CT, USA

*César G. Fraga*

PHYSICAL CHEMISTRY, SCHOOL OF PHARMACY AND BIOCHEMISTRY,  
UNIVERSITY OF BUENOS AIRES, BUENOS AIRES, ARGENTINA

08:00 – 08:30    Rescue of diabetes-related impairment of myocardial  
angiogenesis: potential and challenges

*Nilanjana Maulik*

UNIVERSITY OF CONNECTICUT HEALTH CENTER, DEPARTMENT OF SURGERY,  
MOLECULAR CARDIOLOGY AND ANGIOGENESIS LABORATORY, FARMINGTON,  
CT, USA

08:30 – 09:00    Inducible nitric oxide-derived nitroso-redox balance as  
a key modulator of tolerance to ischemia/reperfusion  
injury in diabetic patients

*Hajime Otani*

DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY, KANSAI  
MEDICAL UNIVERSITY, MORIGUCHI CITY, OSAKA, JAPAN

09:00 – 09:30    Regulation of myocardial growth and death by oxidative  
stress

*Junichi Sadoshima*

DEPARTMENT OF CELL BIOLOGY AND MOLECULAR MEDICINE, CARDIOVASCULAR  
RESEARCH INSTITUTE, NEW JERSEY MEDICAL SCHOOL, UNIVERSITY OF MEDICINE  
AND DENTISTRY, NEWARK, NJ, USA

09:30 – 10:00    Contribution of cholesterol oxidation products to the  
progression of atherosclerotic lesion

*Giuseppe Poli*

DEPARTMENT OF CLINICAL AND BIOLOGICAL SCIENCES, UNIVERSITY OF  
TURIN, SAN LUIGI GONZAGA HOSPITAL, TURIN, ITALY

10:00 – 10:20    *Coffee break*

## SESSION IV TRANSLATIONAL SCIENCE BY MICRONUTRIENTS

ORGANIZERS *Lester Packer and Enrique Cadenas*  
PHARMACOLOGY AND PHARMACEUTICAL SCIENCES, SCHOOL OF PHARMACY,  
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA, USA

Considerable advances in translational science by micronutrients underscore the development of specific therapies for human diseases. Some examples for carotenoids and coenzyme Q: identification of cell targets, gene defects, and single gene polymorphisms, SNPs (*e.g.*, for carotene monooxygenases), thus providing the basis for poor bioavailability. Fostering cardiovascular function sets the basis for the health effects of polyphenols, such as resveratrol, along with its anti-aging effects, which partly mimic the gene expression profile of caloric restriction.

### CAROTENOIDS AND VITAMIN A

*Session Dedicated to the Memory of Norman I. Krinsky*

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

*Klaus Kraemer*  
SIGHT AND LIFE, BASEL, SWITZERLAND

10:20 – 10:30 Norman I. Krinsky  
*Helmut Sies*  
INSTITUTE OF BIOCHEMISTRY AND MOLECULAR BIOLOGY I,  
HEINRICH-HEINE-UNIVERSITY, DÜSSELDORF, DÜSSELDORF, GERMANY

10:30 – 11:00 NORMAN I. KRINSKY MEMORIAL LECTURE  
Colors with functions: Elucidating the biochemical and  
molecular basis of carotenoid metabolism  
*Johannes von Lintig*  
PHARMACOLOGY DEPARTMENT, CASE WESTERN RESERVE UNIVERSITY,  
CLEVELAND, OH, USA

11:00 – 11:25  $\beta$ -Carotene dioxygenase-1 polymorphism

*Georg Lietz*

HUMAN NUTRITION RESEARCH CENTRE, SCHOOL OF AGRICULTURE, FOOD  
AND RURAL DEVELOPMENT, NEWCASTLE UNIVERSITY, NEWCASTLE UPON  
TYNE, UK

11:25 – 11:50 The  $\beta$ -carotene 15,15'-monooxygenase-1 gene affects  
circulating levels of carotenoids

*Richard D. Semba*

DEPARTMENT OF OPHTHALMOLOGY, JOHNS HOPKINS UNIVERSITY  
SCHOOL OF MEDICINE, BALTIMORE, MD, USA

11:50 – 12:15 Determination of 9-*cis*  $\beta$ -carotene and  $\zeta$ -carotene in  
biological samples

*Guangwen Tang*

DOROTHY J. AND GERALD R. FRIEDMAN SCHOOL OF NUTRITION  
SCIENCE AND POLICY, TUFTS UNIVERSITY, BOSTON, MA, USA

12:15 – 12:40 Control of oxidative phosphorylation by vitamin A  
illuminates a fundamental role in mitochondrial energy  
homoeostasis

*Ulrich Hammerling*

MEMORIAL SLOAN-KETTERING CANCER CENTER, IMMUNOLOGY  
PROGRAM, NEW YORK, NY, USA

12:40 – 01:00 Public health aspects of  $\beta$ -carotene as an important  
vitamin A source for humans

*Hans K. Biesalski*

INSTITUTE FOR BIOCHEMISTRY AND NUTRITION SCIENCE, UNIVERSITY OF  
STUTTGART-HOHNHEIM, GERMANY

01:00 – 02:00 *Lunch*



## COENZYME Q

- CHAIRPERSONS *Maret G. Traber*  
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR, USA
- Roland Stocker*  
CENTRE FOR VASCULAR RESEARCH, SCHOOL OF MEDICAL SCIENCES,  
UNIVERSITY OF NEW SOUTH WALES, SYDNEY, NEW SOUTH WALES, AUSTRALIA
- 02:00 – 02:30 New classes of mitochondrion-targeted antioxidants –  
non-radical scavenging inhibitors of lipid peroxidation  
*Valerian Kagan*  
CENTER FOR FREE RADICAL AND ANTIOXIDANT HEALTH AND DEPARTMENT  
OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH, UNIVERSITY OF  
PITTSBURGH, PITTSBURGH, PA, USA
- 02:30 – 03:00 Coenzyme Q in plasma membrane electron transport  
*Plácido Navas*  
CENTRO ANDALUZ DE BIOLOGÍA DEL DESARROLLO, UNIVERSIDAD PABLO DE  
OLAVIDE-CSIC, SEVILLA, SPAIN
- 03:00 – 03:30 Ecto NOX, coenzyme Q<sub>10</sub>, and superoxide production in  
aging  
*D. James Morré*  
DEPARTMENT OF MEDICINAL CHEMISTRY AND MOLECULAR PHARMACOLOGY,  
PURDUE UNIVERSITY, WEST LAFAYETTE, IN, USA
- 03:30 – 04:00 Coenzyme Q in health and disease  
*Iain P. Hargreaves*  
DEPARTMENT OF MOLECULAR NEUROSCIENCE, INSTITUTE OF NEUROLOGY,  
QUEEN SQUARE, LONDON, UK

## POLYPHENOLS

- CHAIRPERSONS *Balz Frei*  
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR, USA
- Manfred Eggersdorfer*  
DSM, BASEL, SWITZERLAND
- 04:00 – 04:30 Targeting inflammatory pathways ‘naturally’ for  
prevention and therapy of cancer and other chronic  
diseases  
*Bharat B. Aggarwal*  
DEPARTMENT OF EXPERIMENTAL THERAPEUTICS, THE UNIVERSITY OF  
TEXAS M. D. ANDERSON CANCER CENTER, HOUSTON, TX, USA
- 04:30 – 05:00 Chemoprevention by pomegranate and green tea  
*Susanne M. Henning*  
CENTER FOR HUMAN NUTRITION, DAVID GEFFEN SCHOOL OF MEDICINE,  
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA, USA
- 05:00 – 05:30 Regulation of antioxidant gene expression by selected  
dietary polyphenols  
*Young-Joon Surh*  
NATIONAL RESEARCH LABORATORY OF MOLECULAR CARCINOGENESIS AND  
CHEMOPREVENTION, COLLEGE OF PHARMACY, SEOUL, SOUTH KOREA
- 05:30 – 06:00 Resveratrol mimics caloric restriction and retards aging  
in the heart  
*Tomas A. Prolla*  
DEPARTMENTS OF GENETICS & MEDICAL GENETICS, UNIVERSITY OF  
WISCONSIN, MADISON, WI, USA

07:30 *Concert, Gala Dinner, and Prizes and Awards*

CONCERT celebrating the 200<sup>th</sup> Anniversary of Frédéric Chopin

PRIZES AND AWARDS

Oxygen Club of California & Jarrow Formulas Health Sciences Prize

*Young- and Established Investigator Awards*

The Science and Humanity Award

Antioxidant & Redox Signaling Translational Research Award

DSM Nutraceutical Research Award

Linus Pauling Institute Awards

Oxygen Club of California Award

**SATURDAY  
MARCH 20**

## SESSION V REDOX IMAGING

Imaging biosciences provide a unique means for the development of translational redox sciences. This session highlights applications and new methodologies for *in vivo* monitoring of oxygenation, free radicals, and redox status.

### CHAIRPERSONS *Hideo Utsumi*

DEPARTMENT OF BIO-FUNCTIONAL SCIENCE, FACULTY OF PHARMACEUTICAL SCIENCES, KYUSHU UNIVERSITY, FUKUOKA, JAPAN

### *Periannan Kuppusamy*

DIVISION OF CARDIOVASCULAR MEDICINE, DAVIS HEART AND LUNG RESEARCH INSTITUTE, THE OHIO STATE UNIVERSITY, COLUMBUS, OH, USA

08:00 – 08:30 Development of PET/SPECT probes and their application to *in vivo* molecular imaging

### *Hideo Saji*

DEPARTMENT OF PATHO-FUNCTIONAL BIOANALYSIS, GRADUATE SCHOOL OF PHARMACEUTICAL SCIENCES, KYOTO UNIVERSITY, KYOTO, JAPAN

08:30 – 09:00 Clinical (EPR) oxymetry for improving diagnosis and treatment in ischemic diseases and tumors and wound healing

### *Harold M. Swartz*

CENTER FOR THE EVALUATIVE CLINICAL SCIENCES AT DARTMOUTH, DARTMOUTH MEDICAL SCHOOL, LEBANON, NH, USA

09:00 – 09:30 Imaging of tissue oxygenation: Novel probes and opportunities

### *Periannan Kuppusamy*

DIVISION OF CARDIOVASCULAR MEDICINE, DAVIS HEART AND LUNG RESEARCH INSTITUTE, THE OHIO STATE UNIVERSITY, COLUMBUS, OH, USA

09:30 – 10:00 *Coffee break*

## SESSION VI AGING

### CHAIRPERSONS *Bruce N. Ames*

NUTRITION AND METABOLISM CENTER, CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND, CA, USA

### *José Viña*

DEPARTMENT OF PHYSIOLOGY, UNIVERSITY OF VALENCIA, VALENCIA, SPAIN

10:00 – 10:30 Ras-Grfl deficiency delays aging in mice by mimicking caloric restriction

### *José Viña*

DEPARTMENT OF PHYSIOLOGY, UNIVERSITY OF VALENCIA, VALENCIA, SPAIN

10:30 – 11:00 Selective autophagy on the cellular response to stress  
*Ana Maria Cuervo*

DEPARTMENT OF DEVELOPMENTAL AND MOLECULAR BIOLOGY, MARION BESSIN LIVER RESEARCH CENTER AND INSTITUTE FOR AGING STUDIES, ALBERT EINSTEIN COLLEGE OF MEDICINE, BRONX, NY, USA

11:00 – 11:30 Regulation of proteasome-mediated protein degradation during aging

### *Tilman Grune*

INSTITUTE OF BIOLOGICAL CHEMISTRY AND NUTRITION, UNIVERSITY HOHENHEIM, STUTTGART, GERMANY

11:30 – 12:00 Delaying age-related disease with micronutrients: triage theory

### *Bruce N. Ames*

NUTRITION AND METABOLISM CENTER, CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND, CA, USA

12:00 – 12:30 Endothelial dysfunction in aged humans is related to oxidative stress and vascular inflammation. A practical approach from translational research

*Leo Rodriguez Mañas*

DEPARTMENT OF GERIATRICS, GETAFE UNIVERSITY HOSPITAL, MADRID, SPAIN

12:30 *Closing Remarks*

*Farewell Lunch*

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