



OXYGEN CLUB OF CALIFORNIA

2008

OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

PROGRAM

12-15 MARCH 2008
FESS PARKER'S DOUBLETREE RESORT
SANTA BARBARA, CALIFORNIA

OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

SANTA BARBARA, CALIFORNIA

MARCH 12-15, 2008

SCIENTIFIC PROGRAM

ORGANIZERS

Helmut Sies

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

César G. Fraga

DEPARTMENT OF NUTRITION, UNIVERSITY OF CALIFORNIA, DAVIS, USA

Enrique Cadenas

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

Lester Packer

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

WEDNESDAY
MARCH 12

05:45

WELCOME

Helmut Sies

PRESIDENT OF THE OXYGEN CLUB OF CALIFORNIA
INSTITUTE OF BIOCHEMISTRY AND MOLECULAR BIOLOGY I,
HEINRICH-HEINE-UNIVERSITY DÜSSELDORF, DÜSSELDORF, GERMANY

06:00–06:45

KEYNOTE LECTURE

CHAIRPERSON

Lester Packer

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

**Mechanisms of delivery of metabolites and drugs across
the blood brain barrier**

William M. Pardridge

DEPARTMENT OF MEDICINE, UNIVERSITY OF CALIFORNIA LOS ANGELES,
LOS ANGELES, CALIFORNIA, USA

06:45–07:30

KEYNOTE LECTURE

CHAIRPERSON

Helmut Sies

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

'Grey matter(s)'

Bert Sakmann

DEPARTMENT OF PHYSIOLOGY, MAX-PLANCK-INSTITUTE FOR MEDICAL
RESEARCH, EIDELBERG, GERMANY

07:30

WELCOME RECEPTION

**THURSDAY
MARCH 13**

WORKSHOP ON
MICRONUTRIENTS AND BRAIN HEALTH

Organized by

Lester Packer, Helmut Sies, Manfred Eggersdorfer, and Enrique Cadenas

SESSION I AGE-REGULATED METABOLIC PATHWAYS, MITOCHONDRIAL
NUTRIENTS, AND NEURODEGENERATION

CHAIRPERSONS *Angelo Azzi*

VASCULAR BIOLOGY LABORATORY, JEAN MAYER USDA-HUMAN
NUTRITION, RESEARCH CENTER ON AGING AT TUFTS UNIVERSITY, BOSTON,
MASSACHUSETTS, USA

Kelvin J.A. Davies

GERONTOLOGY & MOLECULAR BIOLOGY, ETHEL PERCY ANDRUS
GERONTOLOGY CENTER AT THE UNIVERSITY OF SOUTHERN CALIFORNIA,
LOS ANGELES, CALIFORNIA, USA

08:30 – 09:00 Lipoic acid and acetylcarnitine supplementation delay
mitochondrial decay and cognitive function. Micronut-
rient deficiencies accelerate mitochondrial decay

Bruce N. Ames

CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND,
CALIFORNIA, USA

09:00 – 09:30 Loss of mitochondrial NAD(H) and pyruvate dehydro-
genase impair respiration after cerebral ischemia and
reperfusion

Gary Fiskum

DEPARTMENT OF ANESTHESIOLOGY, UNIVERSITY OF MARYLAND SCHOOL OF
MEDICINE, BALTIMORE, MARYLAND, USA

- 09:30 – 10:00 Lipoic acid in Alzheimer's disease – from basic therapeutic concepts to clinical trials
Gerald Münch
COMPARATIVE GENOMICS CENTRE, JAMES COOK UNIVERSITY, TOWNSVILLE, QUEENSLAND, AUSTRALIA
- 10:00 – 10:30 *Coffee break*
- 10:30 – 11:00 Oxidative stress in Alzheimer's disease brain and models thereof: *in vivo* neuroprotection by multifunctional, brain-accessible antioxidants
D. Allan Butterfield
CENTER OF MEMBRANE SCIENCES AND SANDERS-BROWN CENTER ON AGING, UNIVERSITY OF KENTUCKY, LEXINGTON, KENTUCKY, USA
- 11:00 – 11:30 Translating estrogen mechanisms of action into NeuroSERMs and PhytoSERMs for prevention of neurodegenerative disease
Roberta D. Brinton
DEPARTMENT OF PHARMACOLOGY AND PHARMACEUTICAL SCIENCES, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA, USA
- 11:30 – 12:00 Imaging mitochondrial reactive oxygen species: Its augmentation and prevention
Mei-Jie Jou
DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY, CHANG GUNG UNIVERISTY, TAO-YUANG, TAIWAN
- 12:00 – 12:30 Oxidation and assembly of amyloid β -protein in Alzheimer's disease: Casual or causal?
David Teplow
DEPARTMENT OF NEUROLOGY, DAVID GEFEN SCHOOL OF MEDICINE, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA, USA
- 12:30 – 02:00 *Group Photo and Lunch*

SESSION II CHOLINE, METALS, AMINO ACIDS, AND
LIPOPHILIC MICRONUTRIENTS IN BRAIN HEALTH AND FUNCTION

CHAIRPERSONS *Maret G. Traber*

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

Tilman Grune

INSTITUT FÜR BIOLOGISCHE CHEMIE UND ERNÄHRUNGSWISSENSCHAFT,
UNIVERSITÄT HOHENHEIM, STUTTGART, GERMANY

02:00 – 02:30 Maternal nutrition, choline, and the development of the
brain

Steven H. Zeisel

NUTRITION RESEARCH INSTITUTE, DEPARTMENT OF NUTRITION,
SCHOOL OF PUBLIC HEALTH AND SCHOOL OF MEDICINE, UNIVERSITY OF
NORTH CAROLINA AT CHAPEL HILL, CHAPEL HILL, NORTH CAROLINA, USA

02:30 – 03:00 Excitatory amino acids, free radicals, and protein mis-
folding in neurodegenerative disease: Protection by
memantine and nitro-memantine at NMDA-gated
channels

Stuart Lipton

BURNHAM INSTITUTE FOR MEDICAL RESEARCH, THE SALK INSTITUTE,
THE SCRIPPS RESEARCH INSTITUTE, AND UNIVERSITY OF CALIFORNIA, SAN
DIEGO, LA JOLLA, CALIFORNIA, USA

03:00 – 03:30 Zinc and the cytoskeleton in the neuronal modulation of
transcription factor NFAT

Patricia I. Oteiza

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

03:30 – 04:00 **AVED mouse: An *in vivo* model for neuroprotective actions of α -tocopherol**

Kishor Gohil

PULMONARY AND CRITICAL CARE MEDICINE, GENOME AND BIOMEDICAL SCIENCES FACILITY, UNIVERSITY OF CALIFORNIA, DAVIS, CALIFORNIA, USA

04:00 – 04:30 *Coffee break*

04:30 – 05:00 **Stroke: Tocotrienol function and a novel pre-clinical model for translational research**

Chandan K. Sen

LABORATORY OF MOLECULAR MEDICINE, DEPARTMENT OF SURGERY, DAVIS HEART AND LUNG RESEARCH INSTITUTE, THE OHIO STATE UNIVERSITY MEDICAL CENTER, COLUMBUS, OHIO, USA

05:00 – 05:30 **The phenotype of the taurine transporter knockout mouse**

Dieter Häusinger

KLINIK FÜR GASTROENTEROLOGIE, HEPATOLOGIE UND INFEKTIOLOGIE HEINRICH-HEINE-UNIVERSITÄT DÜSSELDORF, DÜSSELDORF, GERMANY

06:00 – 08:00 *Poster Viewing and Refreshments*

FRIDAY
MARCH 14

SESSION III FLAVONOIDS IN CELL SIGNALING AND NEURONAL FUNCTION

CHAIRPERSONS *Josiane Cillard*

LABORATORY OF CELLULAR AND PLANT BIOLOGY, SCHOOL OF
PHARMACEUTICAL SCIENCES, UNIVERSITY OF RENNES, RENNES, FRANCE

César G. Fraga

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

08:00 – 08:30 Modulation of multiple pathways involved in the
maintenance of neuronal function by fisetin

Pamela Maher

THE SALK INSTITUTE, LA JOLLA, CALIFORNIA, USA

08:30 – 09:00 Do flavan-3-ols from green tea reach the human brain?
Absorption, metabolism, and excretion of flavan-3-ols
and procyanidins

Alan Crozier

PLANT BIOCHEMISTRY AND HUMAN NUTRITION, DIVISION OF
ENVIRONMENTAL AND EVOLUTIONARY BIOLOGY, INSTITUTE OF BIOMEDICAL
AND LIFE SCIENCES, UNIVERSITY OF GLASGOW, GLASGOW, UNITED KINGDOM

09:00 – 09:30 The interaction of flavonoids within neuronal signaling
pathways

Jeremy P. Spencer

DEPARTMENT OF BIOCHEMISTRY, UNIVERSITY OF READING, READING,
UNITED KINGDOM

09:30 – 10:00 *Coffee break*

10:00 – 10:30 Estrogen and genistein prevent β -amyloid-induced cell
death by inhibiting the p38 pathway

José Viña

DEPARTMENT OF PHYSIOLOGY, SCHOOL OF MEDICINE,
UNIVERSITY OF VALENCIA, VALENCIA, SPAIN

10:30 – 11:00 Tea polyphenols and prostate cancer

Susanne Henning

CENTER FOR HUMAN NUTRITION, DAVID GEFFEN SCHOOL OF MEDICINE,
UNIVERSITY OF CALIFORNIA LOS ANGELES, CALIFORNIA, USA

11:00 – 11:30 Metabolites and molecular targets of pomegranate
ellagitannins

David Heber

CENTER FOR HUMAN NUTRITION, DAVID GEFFEN SCHOOL OF MEDICINE,
UNIVERSITY OF CALIFORNIA LOS ANGELES, CALIFORNIA, USA

11:30 – 12:00 Pomegranate actions in Alzheimer's disease patho-
physiology

Richard Hartman

DEPARTMENT OF PSYCHOLOGY, LOMA LINDA UNIVERSITY, LOMA LINDA,
CALIFORNIA, USA

12:00 – 01:30 *Lunch*

WORKSHOP ON
LIPOIC ACID AND THIOL REDOX SYSTEMS

Organized by
Bruce N. Ames and Lester Packer

SESSION IV OXIDATIVE STRESS AND THIOL REDOX CIRCUITS IN CELL
FUNCTION

CHAIRPERSONS *Balz Frei*

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

Chandan K. Sen

LABORATORY OF MOLECULAR MEDICINE, DEPARTMENT OF SURGERY,
DAVIS HEART AND LUNG RESEARCH INSTITUTE, THE OHIO STATE
UNIVERSITY MEDICAL CENTER, COLUMBUS, OHIO, USA

01:30 – 02:00 Oxidative stress and thiol redox circuits

Dean P. Jones

EMORY CLINICAL BIOMARKERS LABORATORY AND DIVISION OF PULMONARY,
ALLERGY AND CRITICAL CARE MEDICINE, DEPARTMENT OF MEDICINE,
EMORY UNIVERSITY, ATLANTA, GEORGIA, USA

02:00 – 02:30 Keap1/Nrf2 system as thiol-based sensor/effector
machinery for cytoprotection

Hozumi Motohashi

DEPARTMENT OF MEDICAL BIOCHEMISTRY, TOHOKU UNIVERSITY GRADUATE
SCHOOL OF MEDICINE, SENDAI, JAPAN

02:30 – 03:00 Effects of oxidation and nitric oxide donors on
mammalian thioredoxins and glutaredoxins and their
targets

Arne Holmgren

MEDICAL NOBEL INSTITUTE FOR BIOCHEMISTRY, DEPARTMENT OF
MEDICAL BIOCHEMISTRY AND BIOPHYSICS, KAROLINSKA INSTITUTE,
STOCKHOLM, SWEDEN

03:00 – 03:30 **Inactivation of glutathione peroxidase I in the red cells
of sickle cell patients and its elevation by hydroxyurea**
Sue Goo Rhee

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

03:30 – 04:00 **Glutaredoxin gene therapy in diabetic heart**
Dipak K. Das

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

04:00 – 04:30 **Post-genomic view of phospholipid glutathione
peroxidase (GPx4)**
Fulvio Ursini

DEPARTMENT OF BIOCHEMISTRY, SCHOOL OF MEDICINE, UNIVERSITY OF
PADOVA, PADOVA, ITALY

04:30 – 05:00 **Glutathione peroxidase and redox transcription factors**
Regina Brigelius-Flohé

DEPARTMENT BIOCHEMISTRY OF MICRONUTRIENTS, GERMAN INSTITUTE OF
HUMAN NUTRITION POTSDAM-REHBRÜCKE, NUTHETAL, GERMANY

05:00 – 06:30 *Poster Viewing and Refreshments*

07:00 *Concert*

07:30 *Gala Dinner*

Awards Ceremony

Science and Humanity Awards Committee: *Carroll E.
Cross, Arne Holmgren, Maret G. Traber*

Young Investigator Awards Committee: *Norman I.
Krinsky, Nesrin K. Özer, Josiane Cillard, and Tilman
Grune*

SATURDAY
MARCH 15

SESSION V LIPOIC ACID IN CELL SIGNALING AND TRANSCRIPTION

CHAIRPERSONS *Arne Holmgren*

MEDICAL NOBEL INSTITUTE FOR BIOCHEMISTRY, DEPARTMENT OF
MEDICAL BIOCHEMISTRY AND BIOPHYSICS, KAROLINSKA INSTITUTE,
STOCKHOLM, SWEDEN

Bruce N. Ames

CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND,
CALIFORNIA, USA

08:30 – 09:00 Regulation of the pyruvate dehydrogenase complex by
lipoic acid

Mulchand Patel

DEPARTMENT OF BIOCHEMISTRY, SCHOOL OF MEDICINE AND BIOMEDICAL
SCIENCES, STATE UNIVERSITY OF NEW YORK AT BUFFALO, NEW YORK, USA

09:00 – 09:30 Lipoic acid and lipoamide reduction by thioredoxin
reductases

Elias Arnér

MEDICAL NOBEL INSTITUTE FOR BIOCHEMISTRY, DEPARTMENT OF
MEDICAL BIOCHEMISTRY AND BIOPHYSICS, KAROLINSKA INSTITUTE,
STOCKHOLM, SWEDEN

09:30 – 10:00 1,2-dithiole-3-thione induction of Nrf2 transcriptional
networks

Thomas Kensler

JOHNS HOPKINS UNIVERSITY BLOOMBERG SCHOOL OF PUBLIC HEALTH,
DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCES, BALTIMORE,
MARYLAND, USA

10:00 – 10:30 *Coffee break*

10:30 – 11:00 Age-related loss of Nrf2-mediated gene transcription:
Improvement by lipoic acid

Tory Hagen

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

11:00 – 11:30 Lipoic acid prevents lipotoxic cardiomyopathy in acyl-CoA-synthase transgenic mice

Roger H. Unger

TOUCHSTONE CENTER FOR DIABETES RESEARCH, DEPARTMENT OF
INTERNAL MEDICINE, UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL
CENTER, DALLAS, USA

11:30 – 12:00 Further characterization of the lipoic acid enantiomers
provides new research opportunities

David Carlson

GERONOVA RESEARCH INC., CAMPUS BAY RESEARCH AND
DEVELOPMENT PARK, RICHMOND, CALIFORNIA, USA

SESSION VI CLINICAL STUDIES ON LIPOIC ACID

CHAIRPERSONS *Hans Tritschler*

MEDA PHARMA GMBH, BAD HOMBURG, GERMANY

Alberto Boveris

LABORATORY FOR FREE RADICAL BIOLOGY, SCHOOL OF PHARMACY AND
BIOCHEMISTRY, UNIVERSITY OF BUENOS AIRES, BUENOS AIRES, ARGENTINA

12:00 – 12:30 Clinical aspects of protein thiol redox systems

Junji Yodoi

DEPARTMENT OF BIOLOGICAL RESPONSES, LABORATORY OF INFECTION AND
PREVENTION, INSTITUTE FOR VIRUS RESEARCH, KYOTO UNIVERSITY, KYOTO,
JAPAN

12:30 – 01:00 α -Lipoic acid improves symptomatic diabetic poly-
neuropathy: A preclinical and clinical evaluation of
newest data

Philip Low

DEPARTMENT OF NEUROLOGY, MAYO CLINIC, ROCHESTER, MINNESOTA,
USA

01:00 – 01:30 Effect of α -lipoic acid on experimental diabetic
neuropathy

Angelika Bierhaus

DEPARTMENT OF MEDICINE, UNIVERSITY OF HEIDELBERG, HEIDELBERG,
GERMANY

Closing Remarks

Helmut Sies

Chandan K. Sen

01:30 *Farewell Lunch*

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