

OXYGEN CLUB OF CALIFORNIA

2006

OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

CO-SPONSORED BY THE LINUS PAULING INSTITUTE

PROGRAM

15-18 MARCH 2006 FESS PARKER'S DOUBLETREE RESORT SANTA BARBARA, CALIFORNIA

OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

A CONFERENCE ORGANIZED BY THE

OXYGEN CLUB OF CALIFORNIA

AND

CO-SPONSORED BY THE

LINUS PAULING INSTITUTE

PROGRAM AND CONFERENCE ORGANIZERS

Helmut Sies

OCC PRESIDENT

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

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OCC VICEPRESIDENT

DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA, USA

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OCC CHIEF COMMUNICATIONS OFFICER
DEPARTMENT OF NUTRITION, UNIVERSITY OF CALIFORNIA, DAVIS,
DAVIS, CA, USA

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ENVIRONMENTAL ENERGY TECHNOLOGIES DIVISION, LAWRENCE BERKELEY LABORATORY,
UNIVERSITY OF CALIFORNIA, BERKELEY, CA, USA

Derick Han

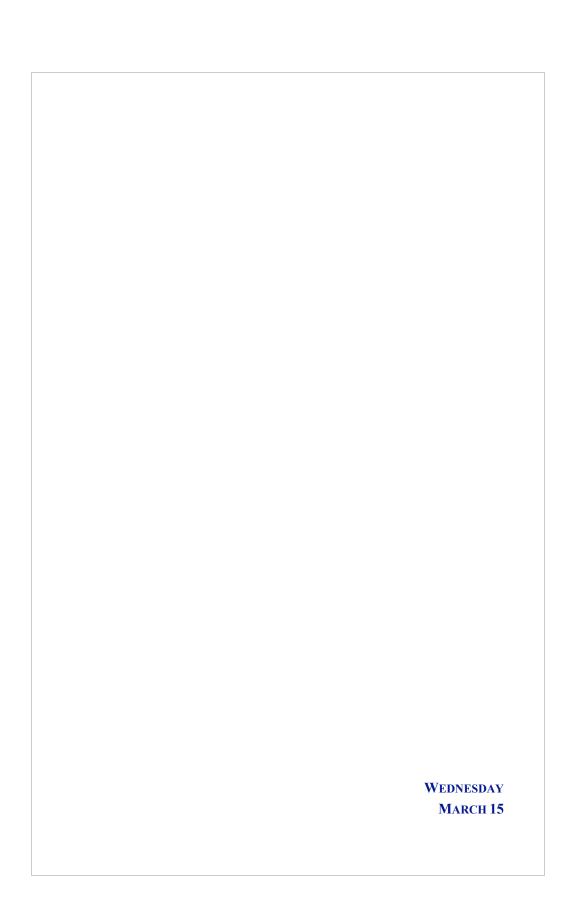
OCC SECRETARY GENERAL

RESEARCH CENTER FOR LIVER DISEASE, KECK SCHOOL OF MEDICINE, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA, USA

Lester Packer

OCC FOUNDING PRESIDENT

DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA, USA



05:50 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 KEYNOTE LECTURE

CHAIRPERSON Bob B. Buchanan – INTRODUCTION

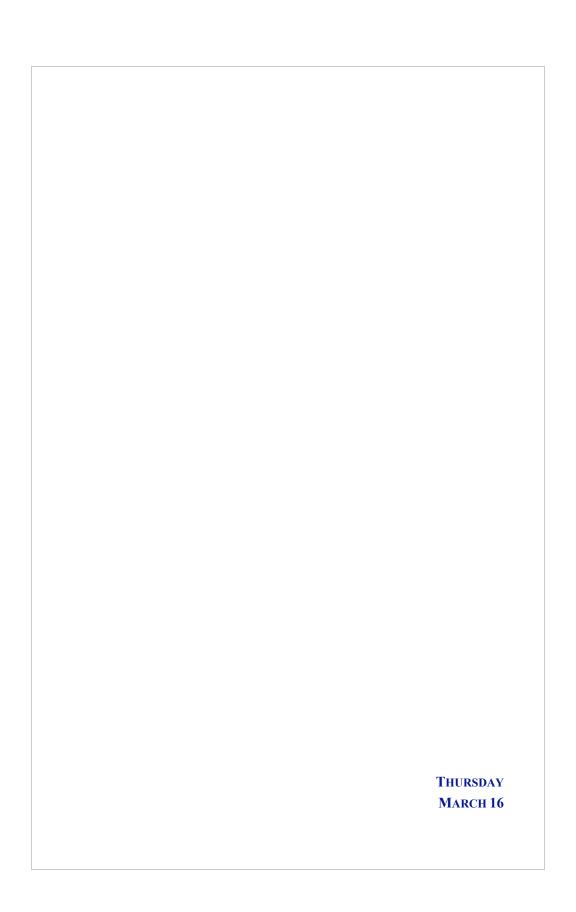
DEPARTMENT OF PLANT AND MICROBIAL BIOLOGY,
UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA, USA

Thioredoxin and glutaredoxin systems: from basic science to clinical applications

Arne Holmgren

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

07:00 WELCOME RECEPTION



| C | O | | |
|-----------|----------|-------------------------|----------------------|
| SESSION I | OBESITY, | THE METABOLIC SYNDROME, | AND OXIDATIVE STRESS |

CHAIRPERSONS Giuseppe Poli

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

Francisco Romero

DEPARTMENT OF PHYSIOLOGY, PHARMACOLOGY & TOXICOLOGY, CARDENAL HERRERA UNIVERSITY, VALENCIA, SPAIN

08:30 – 09:00 Role of oxidative stress in diseases associated with overweight and obesity

Jason D. Morrow

DEPARTMENTS OF MEDICINE AND PHARMACOLOGY, VANDERBILT UNIVERSITY, NASHVILLE, TENNESSEE, USA

09:00 – 09:30 Macronutrient intake induces oxidative and

inflammatory stress while insulin causes suppression of reactive oxygen species generation and inflammation

Paresh Dandona

DIVISION OF ENDOCRINOLOGY, DIABETES, AND METABOLISM, DIABETES-ENDOCRINOLOGY CENTER OF WESTERN NEW YORK, STATE UNIVERSITY OF NEW YORK AT BUFFALO, NEW YORK, USA

09:30 – 10:00 Impact of weight reduction in diabetes type 2 on

inflammation and oxidative stress

David Heber

CENTER FOR HUMAN NUTRITION, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA, USA

10:00 – 10:30 *Coffee break*

10:30 – 11:00 Nutritional modulation of inflammation in the metabolic syndrome

Ishwarlal Jialal

LABORATORY FOR ATHEROSCLEROSIS AND METABOLIC RESEARCH,
DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE,
UNIVERSITY OF CALIFORNIA-DAVIS MEDICAL CENTER, SACRAMENTO,
CALIFORNIA, USA

11:00 – 11:30 Oxidative stress in the adipocyte: local and systemic consequences

Philipp E. Scherer

DEPARTMENT OF CELL BIOLOGY, ALBERT EINSTEIN COLLEGE OF MEDICINE, BRONX, NEW YORK, USA

11:30 – 12:00 A new model for type 2 diabetes: progressive defect in β -cell mass in rats transgenic for human islet amyloid polypeptide

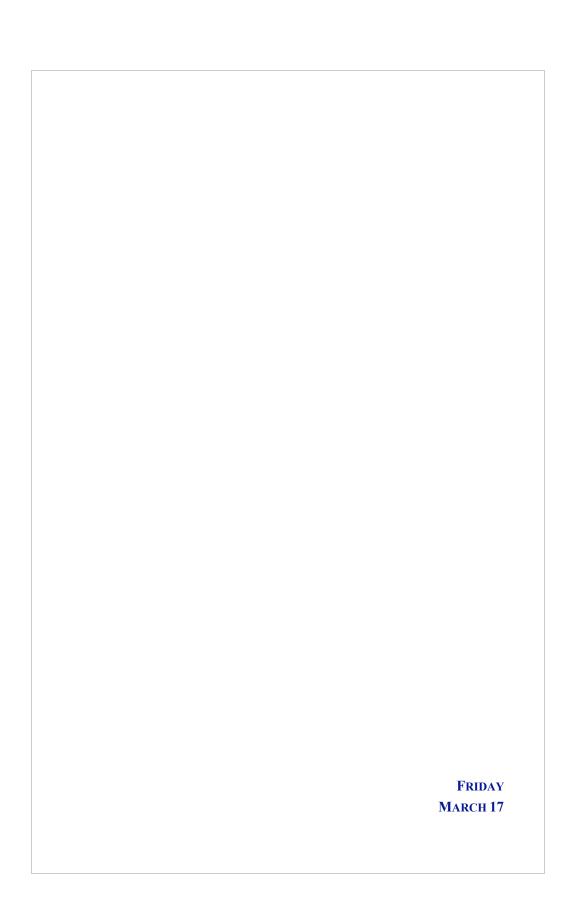
Peter C. Butler

DAVID GEFFEN SCHOOL OF MEDICINE, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA, USA

12:00 – 02:00 *Group Photo and Lunch*

| Session II | OBESITY, UNCOUPLING PROTEINS, AND MICRONUTRIENT ACTION |
|---------------|--|
| CHAIRPERSONS | Maret G. Traber |
| | LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OREGON, USA |
| | Tilman Grune |
| | RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE, HEINRICH-HEINE-UNIVERSITY DÜSSELDORF, DÜSSELDORF, GERMANY |
| 02:00 - 02:30 | Obesity is associated with dysregulation of metabolic |
| | and inflammatory pathways in pregnant women Janet King |
| | CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND, CALIFORNIA, USA |
| 02:30 - 03:00 | Obesity due to metabolic malprogramming in early life Mulchand Patel |
| | DEPARTMENT OF BIOCHEMISTRY, SCHOOL OF MEDICINE AND BIOMEDICAL SCIENCES, STATE UNIVERSITY OF NEW YORK AT BUFFALO, NEW YORK, USA |
| 03:00 - 03:30 | UCP-2, oxidative stress, and the pancreatic β-cell <i>Jingyu Diao</i> |
| | DEPARTMENTS OF MEDICINE AND PHYSIOLOGY, UNIVERSITY OF TORONTO, TORONTO, ONTARIO, CANADA |
| 03:30 - 04:00 | Modulating mitochondrial function in adipocytes and pancreatic β-cells with mitochondrial nutrients: Effects |
| | on UCP2, insulin, and oxidative stress |
| | Jiankang Liu |
| | CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND, CALIFORNIA, USA |
| 04:00 - 04:30 | Coffee break |

| 04:30 - 05:00 | AMP-kinase as a potential target for anti-obesity therapy |
|---------------|--|
| 01.30 03.00 | with dietary factors |
| | Ock-Jin Park |
| | HANNAM UNIVERSITY, DAEJEON, SOUTH KOREA |
| 05:00 - 05:30 | Analysis of Bemo1 knock-out mice uncovers a role of β- |
| | carotene for the regulation of lipid metabolism |
| | Johannes von Lintig |
| | INSTITUTE OF BIOLOGY I, UNIVERSITY OF FREIBURG, FREIBURG, GERMANY |
| 05:30 - 06:00 | Selenium as an anti-inflammatory agent: mechanisms for |
| | its hepatoprotective effect |
| | Oren Tirosh |
| | INSTITUTE OF BIOCHEMISTRY, FOOD SCIENCE AND NUTRITION, HEBREW UNIVERSITY OF JERUSALEM, REHOVOT, ISRAEL |
| | |
| 06:00 - 08:00 | Poster Viewing and Refreshments |
| | |



SESSION III DIETARY MODULATION OF CELL SIGNALING PATHWAYS

CHAIRPERSONS Young-Joon Surh (SESSION CO-ORGANIZER)

COLLEGE OF PHARMACY, SEOUL NATIONAL UNIVERSITY, SEOUL, SOUTH KOREA

Junji Yodoi

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

08:30 – 09:00 Modulation of cell signal transduction by chemo-

preventive phytochemicals

Zigang Dong

HORMEL INSTITUTE, UNIVERSITY OF MINNESOTA, AUSTIN, MINNESOTA, USA

09:00 – 09:30 Regulation of inflammation and glucocorticoid signaling

by dietary polyphenols

Irfan Rahman

DEPARTMENT OF ENVIRONMENTAL MEDICINE, DIVISION OF LUNG BIOLOGY AND DISEASE, UNIVERSITY OF ROCHESTER MEDICAL CENTER, ROCHESTER, NEW YORK, USA

09:30 – 10:00 Flavonoid regulation of the cell cycle via interactions

within MAP kinase and PI₃ kinase/Akt signaling

cascades

Jeremy P. Spencer

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

10:00 – 10:30 *Coffee break*

| 10:30 - 11:00 | Modulation of Nrf2, MAPK, IKK by isothiocyanates |
|---------------|--|
| | and phenolic compounds from in vitro studies to in vivo |
| | pharmacological effects |
| | Tony Kong |
| | DEPARTMENT OF PHARMACEUTICS, RUTGERS UNIVERSITY, PISCATAWAY, NEW JERSEY, USA |
| 11:00 – 11:30 | NF-κB and Nrf2 as prime chemopreventive and |
| | chemoprotective targets of anti-inflammatory and |
| | antioxidative phytonutrients and phytopharmaceuticals |
| | Young-Joon Surh |
| | NATIONAL RESEARCH LABORATORY OF MOLECULAR CARCINOGENESIS AND CHEMOPREVENTION, COLLEGE OF PHARMACY, SEOUL NATIONAL UNIVERSITY, SEOUL, SOUTH KOREA |
| 11:30 – 12:00 | Suppression of PhIP-induced tumors by white tea and |
| | EGCG, but promotion by caffeine |
| | Rod Dashwood |
| | LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OREGON, USA |
| 12:00 - 01:30 | Lunch |
| 01:30 - 02:00 | Dietary modulation of oxidative stress and mucosal |
| | damage by Helicobacter pylori infection |
| | Ki-Baik Hahm |
| | DEPARTMENT OF GASTROENTEROLOGY, AJOU UNIVERSITY SCHOOL OF MEDICINE, SUWON, SOUTH KOREA |
| 02:00 - 02:30 | Chemoprevention and inhibition of tumor metastasis by |
| | selenium compounds |
| | An Sik Chung |
| | KOREAN ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY, DAEJEON, SOUTH KOREA |

| 02:30 - 03:00 | Diets enriched in ω-3 fatty acids decrease amyloid |
|---------------|---|
| | burden and alter signal transduction in a mouse model of |
| | Alzheimer's disease |
| | Greg M. Cole |
| | DEPARTMENT OF MEDICINE, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIFORNIA, USA |
| 03:00 - 03:30 | Effects of lycopene on carotenoid cleavage enzymes I |
| | and II expression in various tissues of F344 rats and |
| | PPAR and RAR gene regulation |
| | John Erdman |
| | DIVISION OF NUTRITIONAL SCIENCES, UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS, USA |
| 03:30 - 04:00 | Coffee break |
| 04:00 - 04:30 | Acetyl-carnitine induces heme oxygenase in rat |
| | astrocytes and protects against oxidative stress: |
| | role of the transcription factor Nrf2 |
| | Vittorio Calabrese |
| | DEPARTMENT OF BIOCHEMISTRY, UNIVERSITY OF CATANIA, CATANIA, ITALY |
| 04:30 - 05:00 | Astaxanthin reduces hyperglycemia-induced oxidative |
| | stress in glomerular cells |
| | Yuji Naito |
| | DEPARTMENT OF MEDICAL PROTEOMICS, KYOTO PREFECTURAL UNIVERSITY OF MEDICINE, KYOTO, JAPAN |
| 05:00 - 05:30 | Genepotency: a new approach to assess and compare the |
| | biological activities of natural compounds |
| | Luca Barella |
| | RESEARCH & DEVELOPMENT DEPARTMENT, DSM NUTRITIONAL PRODUCTS, |

KEYNOTE LECTURE

CHAIRPERSON Angelo Azzi

VASCULAR BIOLOGY LABORATORY, JEAN MAYER USDA-HUMAN NUTRITION

RESEARCH CENTER ON AGING AT TUFTS UNIVERSITY, BOSTON,

MASSACHUSETTS, USA

05:30 – 06:30 Caspase-2 signaling in DNA damage-induced apoptosis

Sten Orrenius

INSTITUTE OF ENVIRONMENTAL MEDICINE, DIVISION OF TOXICOLOGY,

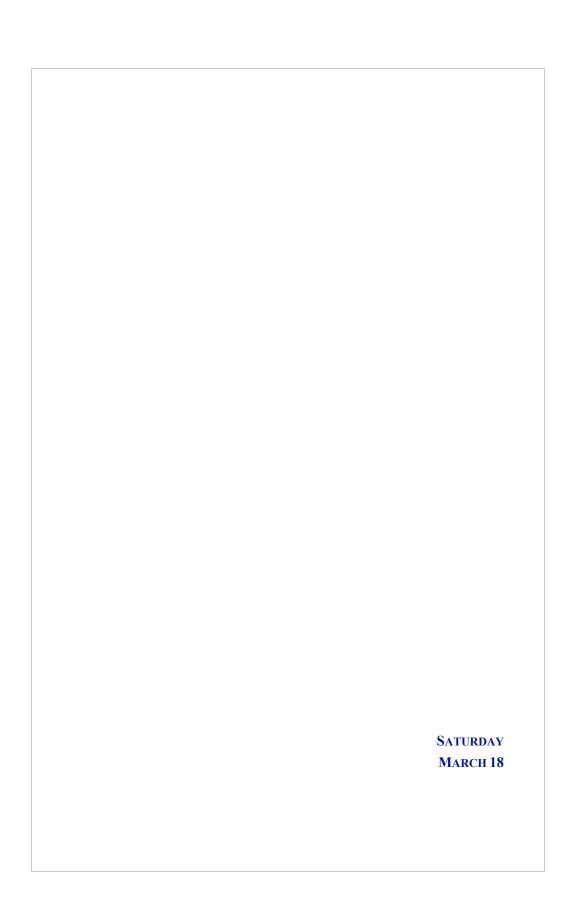
KAROLINSKA INSTITUTE, STOCKHOLM, SWEDEN

06:30 – 08:00 Poster Viewing and Refreshments

08:00 Piano Concert

Gala Dinner

Prizes and Awards



SESSION IV MITOCHONDRIAL FUNCTION, AGING, AND DISEASE

CHAIRPERSONS Alberto Boveris

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

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 Mitochondria: An end-point for nitric oxide signaling in ischemic pre-conditioning

Paul Brookes

DEPARTMENT OF ANESTHESIOLOGY, UNIVERSITY OF ROCHESTER MEDICAL CENTER, ROCHESTER, NEW YORK, USA

09:00 – 09:30 On the role of outer membrane channels in mitochondria-

initiated apoptosis

Marco Colombini

DEPARTMENT OF BIOLOGY, UNIVERSITY OF MARYLAND, COLLEGE PARK, MARYLAND, USA

09:30 – 10:00 Glutathione peroxidase 4 in oxidative stress-induced mitochondrial apoptosis and aging

Holly van Remmen

DEPARTMENT OF CELLULAR AND STRUCTURAL BIOLOGY, UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT SAN ANTONIO, SAN ANTONIO, TEXAS, USA

10:00 – 10:30 Focused proteomics: towards a high throughput mAb based resolution of proteins for diagnosis of mitochondrial diseases

Roderick A. Capaldi

INSTITUTE OF MOLECULAR BIOLOGY, DEPARTMENT OF BIOLOGY, UNIVERSITY OF OREGON, EUGENE, OREGON, USA

| 10:30 - 11:00 | Coffee break |
|---------------|---|
| 11:00 – 11:30 | Glutathione depletion in Parkinson's disease: potential links between subsequent alterations in mitochondrial structure and function Julie K. Andersen Buck Institute for Aging Research, Novato, California, USA |
| 11:30 – 12:00 | Transcriptomal and functional consequences of mitochondrial neurodegenerative disease <i>Gino Cortopassi</i> DEPARTMENT OF MOLECULAR BIOSCIENCES, UNIVERSITY OF CALIFORNIA, DAVIS, CALIFORNIA, USA |
| 12:00 – 12:30 | Modulation of mitochondrial function by pro-oxidants: aging and cardiac ischemia/reperfusion Luke Szweda OKLAHOMA MEDICAL RESEARCH FOUNDATION, OKLAHOMA CITY, OKLAHOMA, USA |
| | Closing Remarks Helmut Sies President of the Oxygen Club of California |
| 01:00 | Farewell Lunch |

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