



OXYGEN CLUB OF CALIFORNIA

2004

OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

CO-SPONSORED BY THE
LINUS PAULING INSTITUTE

PROGRAM

10-13 MARCH, 2004
FESS PARKER'S DOUBLE TREE RESORT
SANTA BARBARA, CALIFORNIA

OCC 2004

A conference organized by the *Oxygen Club of California* and
co-sponsored by the *Linus Pauling Institute*

ORGANIZERS

Lester Packer

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

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INSTITUT FÜR BIOCHEMIE UND MOLEKULARBIOLOGIE I,
HEINRICH-HEINE-UNIVERSITÄT DÜSSELDORF, DÜSSELDORF, GERMANY

Balz Frei

LINUS PAULING INSTITUTE AND DEPARTMENT OF BIOCHEMISTRY & BIOPHYSICS
OREGON STATE UNIVERSITY, CORVALLIS, OR, USA

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SCHOOL OF GERONTOLOGY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA, USA

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BERKELEY, CA, USA

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

WEDNESDAY
MARCH 10

INTRODUCTORY REMARKS

06:00 – 06:15 *Lester Packer*

OCC FOUNDING PRESIDENT
DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY, SCHOOL OF
PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES,
CALIFORNIA

KEYNOTE LECTURE

CHAIRPERSON *Kelvin J. A. Davies*

SCHOOL OF GERONTOLOGY, UNIVERSITY OF SOUTHERN CALIFORNIA,
LOS ANGELES, CA, USA

06:15 – 07:15 A role for supplements in optimizing health:

The metabolic tune-up

Bruce N. Ames

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

07:30 *Welcome reception*

THURSDAY
MARCH 11

SESSION I MITOCHONDRIA, AGING, AND NEURODEGENERATION

CHAIRPERSONS *Enrique Cadenas*

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

Alberto Boveris

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

08:00 – 08:20 Mitochondrial role in cell death programs – old and new

Dale Bredesen

THE BUCK INSTITUTE FOR AGE RESEARCH, NOVATO, CA, USA

08:20 – 08:40 Steroid hormone regulation of mitochondrial function:
Implications for neuron survival and neurodegenerative
disease

Roberta Díaz Brinton

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

08:40 – 09:00 Detecting mitochondria oxidative stress in cultured
neurons

David Nicholls

THE BUCK INSTITUTE FOR AGE RESEARCH, NOVATO, CA, USA

09:00 – 09:20 Chemopreventive strategies towards improving the age-
related loss in stress resistance

Tory Hagen

LINUS PAULING INSTITUTE AND DEPARTMENT OF BIOCHEMISTRY & BIOPHYSICS, OREGON STATE UNIVERSITY, CORVALLIS, OR, USA

09:20 – 09:40 Oxidative stress and therapeutic intervention

Simon Melov

THE BUCK INSTITUTE FOR AGE RESEARCH, NOVATO, CA, USA

09:40 – 10:00 *Coffee break*

- 10:00 – 10:20 Overexpression of superoxide dismutase extends
Drosophila life span
John Tower
MOLECULAR AND COMPUTATIONAL BIOLOGY PROGRAM, DEPARTMENT OF
BIOLOGICAL SCIENCES, UNIVERSITY OF SOUTHERN CALIFORNIA,
LOS ANGELES, CA, USA
- 10:20 – 10:40 Heme metabolism and the mitochondrial decay of aging
brain
Hani Atamna
CHILDREN'S HOSPITAL OAKLAND RESEARCH INSTITUTE, OAKLAND, CA,
USA
- 10:40 – 11:00 The Lon protease, aging, and degenerative diseases
Kelvin J. A. Davies
SCHOOL OF GERONTOLOGY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS
ANGELES, CA, USA
- 11:00 – 11:20 Cardiolipin-cytochrome *c* interaction in the
mitochondrial regulation of caspase activation and
apoptosis
Sten Orrenius
INSTITUTE OF ENVIRONMENTAL MEDICINE, KAROLINSKA INSTITUTE,
STOCKHOLM, SWEDEN

SESSION II MICRONUTRIENTS: VITAMIN E

CHAIRPERSONS *Nesrin K. Özer*

DEPARTMENT OF BIOCHEMISTRY, FACULTY OF MEDICINE,
MARMARA UNIVERSITY, ISTANBUL, TURKEY

Maret G. Traber

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

11:20 – 11:40 **Metabolism and function of vitamin E**

Regina Brigelius-Flohé

DEPARTMENT OF VITAMINS AND ATHEROSCLEROSIS, GERMAN INSTITUTE OF
HUMAN NUTRITION, UNIVERSITY OF POTSDAM, POTSDAM-REHBRÜCKE,
GERMANY

11:40 – 12:00 **Gene regulation by tocopherols**

Angelo Azzi

INSTITUTE OF BIOCHEMISTRY AND MOLECULAR BIOLOGY, UNIVERSITY OF
BERN, BERN, SWITZERLAND

12:00 – 01:00 *Lunch*

01:00 – 01:20 **α -Tocopherol and endothelial nitric oxide synthesis**

Regine Heller

MOLECULAR CELL BIOLOGY, FRIEDRICH-SCHILLER-UNIVERSITY OF JENA,
ERFURT, GERMANY

01:20 – 01:40 **Identification of the molecular mechanism of actions of
 α -tocopherol in rat liver by global gene expression
profile analysis**

Luca Barella

DSM NUTRITIONAL PRODUCTS, HUMAN NUTRITION AND HEALTH, BASEL,
SWITZERLAND

- 01:40 – 02:00 Antioxidants in inflammation and oxidative stress
caused by exercise
Maret G. Traber
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR,
USA
- 02:00 – 02:20 Gene networks of neurodegeneration and hepatic
dysfunction in transgenic mice deficient in α -tocopherol
transfer protein and vitamin E
Kishor Gohil
CENTER FOR COMPARATIVE RESPIRATORY BIOLOGY AND MEDICINE,
DEPARTMENT OF INTERNAL MEDICINE, UNIVERSITY OF CALIFORNIA, DAVIS,
CA, USA

**SESSION III MICRONUTRIENTS:
FLAVONOIDS AND PHYTOESTROGENS**

CHAIRPERSONS *David Heber*

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

Josiane Cillard

LABORATOIRE DE BIOLOGIE CELLULAIRE ET VÉGÉTALE, FACULTÉ DE
PHARMACIE, UNIVERSITÉ DE RENNES I, RENNES, FRANCE

02:20 – 02:40 Molecular mechanism of green tea catechin inhibition of
VEGF-induced angiogenesis

Mohsen Meydani

VASCULAR BIOLOGY LABORATORY, JM USDA-HUMAN NUTRITION
RESEARCH CENTER ON AGING AT TUFTS UNIVERSITY, BOSTON, MA

02:40 – 03:00 Flavanols and dimeric procyanidins inhibit NF- κ B
activation at multiple steps in Jurkat T cells

César Fraga

LABORATORY OF FREE RADICAL BIOLOGY, SCHOOL OF PHARMACY &
BIOCHEMISTRY, UNIVERSITY OF BUENOS AIRES, ARGENTINA AND
DEPARTMENT OF NUTRITION, UNIVERSITY OF CALIFORNIA, DAVIS, CA, USA

03:00 – 03:20 Misfolding of apoB and atherogenesis: Can specific
isoflavones protect by stabilizing protein structure?

Fulvio Ursini

DEPARTMENT OF BIOCHEMISTRY, UNIVERSITY OF PADOVA, PADOVA, ITALY

03:20 – 03:40 Estrogens and phytoestrogens exert their antioxidant
actions by modulating gene expression. Importance in
aging

José Viña

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

03:40 – 04:00 *Coffee break*

SESSION IV MICRONUTRIENTS

CHAIRPERSONS *Balz Frei*

LINUS PAULING INSTITUTE AND DEPARTMENT OF BIOCHEMISTRY &
BIOPHYSICS, OREGON STATE UNIVERSITY, CORVALLIS, OR, USA

Klaus Kraemer

SCIENTIFIC AFFAIRS HUMAN NUTRITION, BASF AKTIENGESELLSCHAFT,
LUDWIGSHAFEN, GERMANY

04:00 – 04:20 The role of reactive oxygen species and antioxidants in
wound healing during diabetic complications

Tammy Bray

COLLEGE OF HEALTH AND HUMAN SCIENCES, OREGON STATE UNIVERSITY,
CORVALLIS, OR, USA

04:20 – 04:40 Selenium delivery proteins can provide relatively non-
toxic elemental forms of selenium for *in vivo*
biosynthesis of selenophosphate and specific
selenoproteins

Thressa C. Stadtman

LABORATORY OF BIOCHEMISTRY, NHLBI, NATIONAL INSTITUTES OF
HEALTH, BETHESDA, MD, USA

04:40 – 05:00 The effects of fermented papaya preparation on
 β -thalassemia patients: Flow cytometry analysis of red
blood cell and platelet oxidative status

Eitan Fibach

DEPARTMENT OF HEMATOLOGY, HADASSAH UNIVERSITY HOSPITAL,
JERUSALEM, ISRAEL

05:00 – 05:20 The effects of vitamin C, flavonoids, and fructose on
antioxidant protection of human plasma

Balz Frei

LINUS PAULING INSTITUTE AND DEPARTMENT OF BIOCHEMISTRY &
BIOPHYSICS, OREGON STATE UNIVERSITY, CORVALLIS, OR, USA

- 05:20 – 05:40 α -Lipoic acid in health and disease: An overview
Hans-Jürgen Tritschler
VIATRIS GMBH & CO. KG, FRANKFURT, GERMANY
- 05:40 – 06:00 Carnitines modulation of cellular response to oxidative stress
Vittorio Calabrese
DEPARTMENT OF BIOCHEMISTRY, UNIVERSITY OF CATANIA, ITALY
- 06:00 – 06:20 Ten basic requirements for reporting antioxidant activity of test substances in *in vitro* experiments and *in vivo* animal studies
Hans Verhagen
UNILEVER HEALTH INSTITUTE, VLAARDINGEN, THE NETHERLANDS
- 06:20 *Refreshments and poster viewing*

FRIDAY
MARCH 12

SESSION V COENZYME Q

CHAIRPERSONS *Alex Sevanian*

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

Abe Reznick

BRUCE RAPPAPORT FACULTY OF MEDICINE, DEPARTMENT OF ANATOMY AND
CELL BIOLOGY, TECHNION-ISRAEL INSTITUTE OF TECHNOLOGY, HAIFA,
ISRAEL

09:00 – 09:20 **Antioxidant activity of lipoprotein-associated ubiquinol-10**

Roland Stocker

CENTRE FOR VASCULAR RESEARCH, SCHOOL OF MEDICAL SCIENCES,
UNIVERSITY OF NEW SOUTH WALES, NSW, SYDNEY, AUSTRALIA

09:20 – 09:40 **Ubiquinol/ubiquinone ratio as a marker of oxidative
stress**

Yorihiro “Junkan” Yamamoto

DEPARTMENT OF CHEMISTRY AND BIOTECHNOLOGY, GRADUATE SCHOOL OF
ENGINEERING, UNIVERSITY OF TOKYO, TOKYO, JAPAN

09:40 – 10:00 **Antioxidant approaches for the treatment of
neurodegenerative diseases**

Flint Beal

DEPARTMENT OF NEUROLOGY, CORNELL UNIVERSITY MEDICAL COLLEGE,
NEW YORK, NY, USA

10:00 – 10:20 **Effect of CoQ10 and exercise training in ischemic heart
disease: Biochemical and clinical aspects**

Gian Paolo Littarru

INSTITUTE OF BIOCHEMISTRY, FACULTY OF MEDICINE, UNIVERSITY OF
ANCONA, ANCONA, ITALY

10:20 – 10:40 *Group Photo*

10:40 – 11:00 *Coffee break*

SESSION VI REDOX SIGNALING AND GENE EXPRESSION

CHAIRPERSONS *Henry J. Forman*

SCHOOL OF NATURAL SCIENCES, UNIVERSITY OF CALIFORNIA MERCED,
MERCED, CA, USA

Junji Yodoi

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

11:00 – 11:20 Redox regulation of transcription factor activity

Gisela Storz

CELL BIOLOGY AND METABOLISM BRANCH, NATIONAL INSTITUTE OF CHILD
HEALTH AND HUMAN DEVELOPMENT, NATIONAL INSTITUTES OF HEALTH,
BETHESDA, USA

11:20 – 11:40 The pyridine nucleotide cycle in *Salmonella*; three
allosteric enzymes mediate control of NAD/NADP
levels

J. R. Roth

CENTER FOR GENETICS AND DEVELOPMENT, UNIVERSITY OF CALIFORNIA,
DAVIS, CA, USA

11:40 – 12:00 Inhibition of apoptosis leads to increased accumulation
of oxidized proteins

Earl Stadtman

LABORATORY OF BIOCHEMISTRY, NATIONAL HEART, LUNG, AND BLOOD
INSTITUTE, NATIONAL INSTITUTES OF HEALTH, BETHESDA, MD, USA

12:00 – 01:00 *Lunch*

- 01:00 – 01:20 Peroxynitrite in amyotrophic lateral sclerosis (ALS)
Joe Beckman
LINUS PAULING INSTITUTE, ENVIRONMENTAL HEALTH SCIENCES CENTER,
DEPARTMENT OF BIOCHEMISTRY AND BIOPHYSICS, OREGON STATE
UNIVERSITY, CORVALLIS, OR, USA
- 01:20 – 01:40 Microtubule detyrosination: A redox-sensitive regulatory
switch for hyperproliferative cell growth
Jason Eiserich
DIVISION OF PULMONARY-CRITICAL CARE MEDICINE, UNIVERSITY OF
CALIFORNIA AT DAVIS, DAVIS, CA, USA
- 01:40 – 02:00 Proatherogenic gene modulation by cholesterol
oxidation products in vascular cells
Giuseppe Poli
DEPARTMENT OF CLINICAL AND BIOLOGICAL SCIENCES, UNIVERSITY OF
TURIN AT S. LUIS GONZAGA HOSPITAL, TURIN, ITALY
- 02:00 – 02:20 Antioxidant defense mechanism in pathogens
Leopold Flohé
DEPARTMENT OF BIOCHEMISTRY, TU-BRAUNSCHWEIG, BRAUNSCHWEIG,
GERMANY
- 02:20 – 02:40 Oxidative stress, lysosomal iron, and DNA damage
Ulf Brunk
DEPARTMENT OF PATHOLOGY II, SCHOOL OF MEDICINE, UNIVERSITY OF
LINKÖPING, LINKÖPING, SWEDEN
- 02:40 – 03:00 Mitochondrial glutaredoxin knockdown and apoptosis
Arne Holmgren
MEDICAL NOBEL INSTITUTE FOR BIOCHEMISTRY, DEPARTMENT OF MEDICAL
BIOCHEMISTRY AND BIOPHYSICS, KAROLINSKA INSTITUTE, STOCKHOLM,
SWEDEN

- 03:00 – 03:20 Oxidative stress gene modulation in mesothelioma as assessed by microarray *in-vitro*, *ex-vivo*, and *in-situ* analysis
Bertrand Rihn
INSTITUT NATIONAL DE RECHERCHE ET DE SÉCURITÉ, VANDOEUVRE-LÈS-NANCY, FRANCE
- 03:20 – 03:40 Heme oxygenase-1 as a novel therapeutic target of drugs and micronutrients in the endothelium
Henning Schröder
DEPARTMENT OF PHARMACOLOGY AND TOXICOLOGY, SCHOOL OF PHARMACY, MARTIN LUTHER UNIVERSITY, HALLE (SAALE), GERMANY
- 03:40 – 04:00 Redox regulation of T-cell activation by thioredoxin and TBP-2/VDUP-1: Involvement of lipid Raft
Junji Yodoi
DEPARTMENT OF BIOLOGICAL RESPONSES, LABORATORY OF INFECTION AND PREVENTION, INSTITUTE FOR VIRUS RESEARCH, KYOTO UNIVERSITY, KYOTO, JAPAN
- 04:00 – 04:20 *Coffee break*

SESSION VII CAROTENOIDS AND RETINOIDS

CHAIRPERSONS *John S. Bertram*

CELL AND MOLECULAR BIOLOGY, CANCER RESEARCH CENTER OF HAWAII,
UNIVERSITY OF HAWAII, HONOLULU, HAWAII

Lester Packer

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

04:20 – 04:40 Chemical and metabolic oxidation of carotenoids

Fred Khachik

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY, JOINT INSTITUTE FOR
FOOD SAFETY AND APPLIED NUTRITION (JIFSAN), UNIVERSITY OF
MARYLAND, COLLEGE PARK, MARYLAND, USA

04:40 – 05:00 Raman detection of carotenoids in human tissue

Werner Gellerman

DEPARTMENT OF PHYSICS, UNIVERSITY OF UTAH, SALT LAKE CITY, UT,
USA

05:00 – 05:20 Resistance to oxidative stress following carotenoid
supplementation in humans

Kyung-Jin Yeum

JEAN MAYER USDA HUMAN NUTRITION RESEARCH CENTER ON AGING,
TUFTS UNIVERSITY, BOSTON, MA, USA

05:20 – 05:40 Formation and biological effects of β -carotene cleavage
products in view of the particular conditions in inflamed
lung tissue

Olaf Sommerburg

DEPARTMENT OF PEDIATRICS, UNIVERSITY HOSPITAL ULM, GERMANY

05:40 – 06:00 Lycopene and prostate health

Ute Obermueller-Jevic

SCIENTIFIC AFFAIRS HUMAN NUTRITION, BASF AKTIENGESELLSCHAFT,
LUDWIGSHAFEN, GERMANY

06:00 *Refreshments and poster viewing*

08:00 *Gala Dinner*

Awards and Prizes

OCC Young Investigator Awards

OCC – Dekker Foundation Young Investigator Award

OCC – BASF Young Investigator Award

OCC – DSM Young Investigator Award

Pharmanex Scientific Prize

Osato Research Institute Science & Humanity Prize

**SATURDAY
MARCH 13**

SESSION VIII CAROTENOIDS AND RETINOIDS

CHAIRPERSONS *Norman I. Krinsky*

DEPARTMENT OF BIOCHEMISTRY, SCHOOL OF MEDICINE, TUFTS UNIVERSITY,
BOSTON, MA, USA

Carroll E. Cross

MEDICINE AND PHYSIOLOGY, UNIVERSITY OF CALIFORNIA DAVIS, DAVIS,
CA, USA

- 09:00 – 09:20 Carotenoids and gene regulation by the antioxidant response element
Yoav Sharoni
DEPARTMENT OF CLINICAL BIOCHEMISTRY, FACULTY OF HEALTH SCIENCES,
BEN-GURION UNIVERSITY OF THE NEGEV, BEER-SHEVA, ISRAEL
- 09:20 – 09:40 Cleave it or leave it: Carotenoids metabolism and its impact on vision, cell differentiation, and development
Johannes von Lintig
INSTITUT FÜR BIOLOGIE I, UNIVERSITÄT FREIBURG, FREIBURG, GERMANY
- 09:40 – 10:00 Macular carotenoids in eye health
Richard A. Bone
DEPARTMENT OF PHYSICS, FLORIDA INTERNATIONAL UNIVERSITY, MIAMI,
FA, USA
- 10:00 – 10:20 Lutein effects on nervous tissue in experimental diabetes
Francisco J. Romero
DEPARTMENT OF PHYSIOLOGY, PHARMACOLOGY, AND TOXICOLOGY,
UNIVERSITY CARDENAL HERRERA, VALENCIA, SPAIN
- 10:20 – 10:40 Biological activity of lycopene against smoke-induced lung lesions
Xiang-Dong Wang
NUTRITION AND CANCER BIOLOGY LABORATORY, JEAN MAYER UNITED STATES DEPARTMENT OF AGRICULTURE, HUMAN NUTRITION RESEARCH CENTER ON AGING AT TUFTS UNIVERSITY, BOSTON, MA, USA
- 10:40 – 11:00 *Coffee break*

- 11:00 – 11:20 Effects of carotenoids and retinoids on gap junctional
intercellular communication
Wilhelm Stahl
INSTITUT FÜR BIOCHEMIE UND MOLEKULARBIOLOGIE I, HEINRICH-HEINE-
UNIVERSITÄT DÜSSELDORF, DÜSSELDORF, GERMANY
- 11:20 – 11:40 Vitamin A in signal transduction: Role as essential
cofactor for serine/threonine kinases
Ulrich Hammerling
IMMUNOLOGY PROGRAM, MEMORIAL SLOAN-KETTERING CANCER CENTER,
NEW YORK, NY, USA
- 11:40 – 12:00 Lycopene and cardiovascular disease risk
John W. Erdman
DIVISION OF NUTRITIONAL SCIENCES, UNIVERSITY OF ILLINOIS, URBANA-
CHAMPAIGN, ILLINOIS, USA
- 12:00 – 12:20 Mitochondria as the target for pro-apoptotic synthetic
retinoids
Reuben Lotan
DEPARTMENT OF THORACIC/HEAD AND NECK MEDICAL ONCOLOGY, THE
UNIVERSITY OF TEXAS, MD ANDERSON CANCER CENTER, HOUSTON, TX, USA
- 12:20 – 12:40 New horizons in carotenoid and retinoid research
Helmut Sies
INSTITUT FÜR BIOCHEMIE UND MOLEKULARBIOLOGIE I, HEINRICH-HEINE-
UNIVERSITÄT DÜSSELDORF, DÜSSELDORF, GERMANY
- Closing remarks
Kelvin J. A. Davies
OCC PRESIDENT
Lester Packer
OCC FOUNDING PRESIDENT
- 01:00 *Farewell Lunch*

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