OXIDANTS AND ANTIOXIDANTS IN BIOLOGY

A JOINT MEETING OF THE
SOCIETY FOR FREE RADICAL RESEARCH INTERNATIONAL
CO-Sponsored by the
LINUS PAULING INSTITUTE

MARCH 7–10, 2001
FESS PARKER’S DOUBLE TREE RESORT
SANTA BARBARA, CALIFORNIA
ORGANIZERS

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

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SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

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SCIENTIFIC PROGRAM CHAIR

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

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SCIENTIFIC PROGRAM CO-CHAIRS

Carroll E. Cross
DEPARTMENT OF INTERNAL MEDICINE, UNIVERSITY OF CALIFORNIA, DAVIS, CA

Balz Frei
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR

Catherine Rice-Evans
CENTRE FOR AGE-RELATED DISEASES,
GKT SCHOOL OF BIOMEDICAL SCIENCES, KING’S COLLEGE, LONDON, UK

Helmut Sies
INSTITUT FÜR PHYSIOLOGISCHE CHEMIE I, HEINRICH-HEINE-UNIVERSITÄT
DÜSSELDORF, GERMANY
02:00–08:00  Registration

06:00  Welcome
Lester Packer
President, Oxygen Club of California

06:15  Keynote Lecture

Chairperson  Sten Orrenius
Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden

Cancer-associated mutations in manganese superoxide dismutase: lung versus prostate
Joe McCord
Weib-Waring Institute, University of Colorado Health Sciences Center, Denver, CO

07:30  Welcome Reception — Poster Viewing
**SESSION I  NITRIC OXIDE INTERACTIONS WITH MEMBRANES**

**CHAIRMAN**  
*Victor Darley-Usmar*  
**DEPARTMENT OF PATHOLOGY, UNIVERSITY OF ALABAMA AT BIRMINGHAM, BIRMINGHAM, AL**

08:00–08:20  
Physical and chemical dynamics of nitric oxide in membranes  
*Jack R. Lancaster, Jr.*  
**DEPARTMENTS OF PHYSIOLOGY AND MEDICINE, LSU MEDICAL CENTER, NEW ORLEANS, LA**

08:20–08:40  
Interactions of peroxynitrite and nitric oxide with the mitochondrial inner membrane  
*Michael P. Murphy*  
**BIOCHEMISTRY DEPARTMENT, UNIVERSITY OF OTAGO, DUNEDIN, NEW ZEALAND**

08:40–09:00  
Nitration and oxidation of a hydrophobic tyrosine probe by peroxynitrite in membranes: comparison with nitration/oxidation of tyrosine by peroxynitrite in aqueous solution  
*Raman Kalyanaraman*  
**BIOPHYSICS RESEARCH INSTITUTE, MEDICAL COLLEGE OF WISCONSIN, MILWAUKEE, WI**

09:00–09:20  
The mitochondrial nitric oxide synthase  
*Alberto Boveris*  
**FISICOQUIMICA, FACULTAD DE FARMACIA Y BIOQUIMICA, UNIVERSIDAD DE BUENOS AIRES, BUENOS AIRES, ARGENTINA**
09:20–09:40  Redox regulation of nitric oxide biochemistry by hemoglobin

Rakesh P. Patel
DEPARTMENT OF PATHOLOGY, UNIVERSITY OF ALABAMA AT BIRMINGHAM, BIRMINGHAM, AL

09:40 – 10:00  The impact of the interface between endothelium and blood on nitric oxide signaling

James Liao
DEPARTMENT OF CHEMICAL ENGINEERING, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA

10:00–10:20  Nitric oxide in regulation of ion channel function

Marek Radomski
DEPARTMENT OF PHARMACOLOGY, UNIVERSITY OF ALBERTA, CANADA

10:20–10:40  Break
SESSION II  MYELOPEROXIDASES AND OTHER PEROXIDASES IN CARDIOVASCULAR DISEASE. OXYGEN AND NITROGEN-BASED RADICAL FORMATION AND INJURY

CHAIRPERSONS  Ouliana Ziouzenkova
               VASCULAR MEDICINE AND ATHEROSCLEROSIS UNIT, CARDIOVASCULAR DIVISION, BRIGHAM AND WOMEN’S HOSPITAL, HARVARD MEDICAL SCHOOL, BOSTON, MA

               Sampath Parthasarathy
               DEPARTMENT OF GYNECOLOGY & OBSTETRICS, EMBRY UNIVERSITY SCHOOL OF MEDICINE, ATLANTA, GA

10:40–11:00  A novel class of specific oxidized choline glycerophospholipids serve as ligands for the macrophage scavenger receptor CD36
               Stanley Hazen
               DEPARTMENT OF CELL BIOLOGY, CLEVELAND CLINIC FOUNDATION, CLEVELAND, OH

11:00–11:20  Peroxidase-based mechanisms for impaired nitric oxide signaling during inflammation
               Jason Eiserich
               DEPARTMENT OF INTERNAL MEDICINE, DIVISION OF NEPHROLOGY, UNIVERSITY OF CALIFORNIA AT DAVIS, DAVIS, CA

11:20–11:40  Use of animal models to examine the role of myeloperoxidase in inflammatory disease
               Marie Brennan
               DIVISION OF CARDIOLOGY, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA

11:40–12:00  Myeloperoxidase-mediated oxidation of LDL: A blessing in disguise
               Sampath Parthasarathy
               DEPARTMENT OF GYNECOLOGY & OBSTETRICS, EMBRY UNIVERSITY SCHOOL OF MEDICINE, ATLANTA, GA
12:00–12:20  Modulation of peroxidase-dependent PPAR signaling by antioxidants

Ouliana Ziouzenkova
VASCULAR MEDICINE AND ATHEROSCLEROSIS UNIT, CARDIOVASCULAR DIVISION, BRIGHAM AND WOMEN’S HOSPITAL, HARVARD MEDICAL SCHOOL, BOSTON, MA

12:40–1:00  Group Photo

01:00–02:00  Lunch
Session III  Plasma membrane oxidases: Role in reactive oxygen species-mediated signaling
Oxygen sensors and signal regulation

Chairpersons
Bernard Babior
The Scripps Research Institute, La Jolla, CA

Carroll E. Cross
Department of Internal Medicine, University of California, Davis, CA

02:00–02:20  Oxygen sensing, signaling and the regulation of physiologically important genes
Frank Bunn
Hematology Research, Longwood Medical Research Center, Boston, MA

02:20–02:40  Sensors, mediators and responses of the oxygen sensing signal pathway
Helmut Acker
Max Planck Institut für Molekulare Physiologie, Dortmund, Germany

02:40–3:00  The Nox family of homologs of gp91-phox
David Lambeth
Department of Biochemistry, Emory University School of Medicine, Atlanta, GA

03:00–03:20  Superoxide production by phagocytes: Regulation of flavocytochrome b558 activation and role of rho GTPase Rac2
Mary Dinauer
Wells Center for Pediatric Research, Indiana School of Medicine, Indianapolis, IN
03:20–03:40  Pro-inflammatory cytokines induce partial phosphorylation of p47phox under priming conditions of human neutrophils  
*Jamel El Benna*  
INSERM U479, PARIS, FRANCE

03:40–04:00  Redox regulation of hypoxic signalling: the activation mechanism of HIF1α  
*Kiishi Hirota*  
INSTITUTE OF GENETIC MEDICINE, JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE, BALTIMORE, MD

04:00–04:20  Pro-atherogenic oxidative signaling in vascular cells  
*Marshall Runge*  
DIVISION OF CARDIOLOGY, UNIVERSITY OF TEXAS MEDICAL BRANCH, GALVESTON, TX

04:20–04:40  Break
Session IV  PROTEIN OXIDATION AND THE PROTECTIVE ROLE OF PROTEOLYTIC ENZYMES IN HEALTH AND DISEASE

Chairpersons  Catherine Pasquier
INSMR U479, PARIS, FRANCE

Kelvin J. A. Davies
ETHEL PERCY ANDRUS GERONTOLOGY CENTER AND DIVISION OF MOLECULAR BIOLOGY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

04:40–05:00  Proteolytic pathways and cellular protection during oxidative stress, aging and disease
Kelvin J. A. Davies
ETHEL PERCY ANDRUS GERONTOLOGY CENTER AND DIVISION OF MOLECULAR BIOLOGY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

05:00–05:20  Protein oxidative damage during aging is highly selective
Raj Sohal
UNIVERSITY OF SOUTHERN CALIFORNIA, SCHOOL OF PHARMACY, DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY, LOS ANGELES, CA

05:20–05:40  Selective recognition of oxidized proteins by the proteasome
Tilman Grune
NEUROSCIENCE RESEARCH CENTER, MEDICAL FACULTY, HUMBOLDT UNIVERSITY BERLIN, BERLIN, GERMANY
05:40–06:00  Deficiency of 20S proteasome functions induced by environmental pathological factors: from structural analysis to pharmacoproteomics

Jean-Edouard Gairin
INSTITUT DE PHARMACOLOGIE ET BIOLOGIE STRUCTURALE, TOULOUSE, FRANCE

06:00–07:30  Refreshments and Poster Viewing
SESSION V  OXIDATIVE STRESS AND ITS ROLE IN CELL REGULATION AND DISEASE

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

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

08:00–08:20  Overview of redox signaling
Junji Yodoi
INSTITUTE FOR VIRUS RESEARCH, DEPARTMENT OF BIOLOGICAL RESPONSES, KYOTO UNIVERSITY, KYOTO, JAPAN.

08:20–08:40  Antioxidant functions of thioredoxin and glutaredoxin systems
Arne Holmgren
MEDICAL NOBEL INSTITUTE FOR BIOCHEMISTRY, DEPARTMENT OF MEDICAL BIOCHEMISTRY AND BIOPHYSICS, KAROLINSKA INSTITUTE, STOCKHOLM, SWEDEN.

08:40–09:00  Anti-inflammatory activity of soluble thioredoxin: Redox modulation of chemotactic activity
Hajime Nakamura
DEPARTMENT OF BIOLOGICAL RESPONSES, INSTITUTE FOR VIRUS RESEARCH, KYOTO UNIVERSITY, KYOTO, JAPAN

09:00–09:20  Nrf2 and Keap1 regulation of oxygen stress response
Masayuki Yamamoto
UNIVERSITY OF TSUKUBA, TSUKUBA, JAPAN

09:20–09:40  Antioxidant defense in pathogenic protozoa
Leopold Flohé
DEPARTMENT OF BIOCHEMISTRY, TECHNICAL UNIVERSITY OF BRAUNSCHWEIG, BRAUNSCHWEIG, GERMANY

09:40–10:00  Break

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**SESSION VI  ROLE OF ANTIOXIDANTS IN CELL SIGNALING**

**CHAIRPERSONS**  *Balz Frei*  
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR

*Lester Packer*  
DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

10:00–10:20  \(\alpha\)-Tocopherol-associated protein (TAP): Structure, function, and cellular distribution  
*Angelo Azzi*  
INSTITUTE OF BIOCHEMISTRY AND MOLECULAR BIOLOGY, UNIVERSITY OF BERN, BERN, SWITZERLAND

10:20–10:40  Functional Analysis of the \(\alpha\)-tocopherol transfer protein in mice  
*Maret G. Traber*  
LINUS PAULING INSTITUTE, OREGON STATE UNIVERSITY, CORVALLIS, OR

10:40–11:00  \(\alpha\)-Tocopherol signaling in endothelial and platelet function  
*John Keaney*  
BOSTON UNIVERSITY SCHOOL OF MEDICINE, BOSTON, MA

11:00–11:20  Biological significance of carotenoid breakdown products  
*Olaf Sommerburg*  
DEPARTMENT OF PEDIATRICS, UNIVERSITY OF ULM, ULM, GERMANY

11:20–11:40  New insights into vitamin E metabolism  
*Regina Brigelius-Flohé*  
GERMAN INSTITUTE OF HUMAN NUTRITION, BERGHOLZ-REHBÜRCKE, GERMANY
11:40–12:00  Endothelial dysfunction in the early stages of atherogenesis: Redox and non-redox regulation of transcription factor activation and gene expression

_Fabio Virgili_

_NATIONAL INSTITUTE FOR FOOD AND NUTRITION RESEARCH, ROME, ITALY_

12:00–01:30  _Lunch_
## SESSION VII  ANTIOXIDANT PROPERTIES OF CATECHINS AND THEIR OLIGOMERS: RELATIONSHIP TO HEALTH

### CHAIRPERSONS

*Helmut Sies*

Institut für Physiologische Chemie I, Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany

*Catherine Rice-Evans*

Centre for Age-Related Diseases, GKT School of Biomedical Sciences, King's College, London, UK

### 01:00–01:20  ANALYSIS OF COCOA POLYPHENOL OLIGOMERS

*John F. Hammerstone*

Mars Inc., Hackettstown, NJ

### 01:20–01:40  ABSORPTION AND METABOLISM OF COCOA POLYPHENOLS IN HUMANS

*Junji Terao*

Department of Nutrition, School of Medicine, The University of Tokushima, Tokushima, Japan

### 01:40–02:00  GASTROINTESTINAL METABOLISM OF CATECHINS AND PROCYANIDINS

*Jeremy Spencer*

Centre for Age-Related Diseases, GKT School of Biomedical Sciences, King's College, London, UK

### 02:00–02:20  CYTOKINE RESPONSES TO COCOA IN HUMANS

*Carl Keen*

Department of Nutrition, University of California, Davis, CA

### 02:20–02:40  POLYPHENOLS, GAP-JUNCTIONAL COMMUNICATION AND PEROXYNITRITE

*Helmut Sies*

Institut für Physiologische Chemie I, Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany
02:40–03:00  Biological activity *in vivo* of procyanidins from *Vitis vinifera*

*Giancarlo Aldini*

ISTITUTO CHIMICO-FARMACEUTICO Tossicologico, University of Milan, Milan, Italy

03:00–03:20  Protein binding and cell redox regulation by the procyanidin-rich French maritime pine bark extract pycnogenol

*Lester Packer*

Department of Molecular Pharmacology & Toxicology, School of Pharmacy, University of Southern California, Los Angeles, CA

03:20–03:40  Break
SESSION VIII  WORKSHOP ON CLINICAL TRIALS ON ANTIOXIDANTS: INSIGHTS AND PROBLEMS

CHAIRPERSONS  Norman I. Krinsky  
DEPARTMENT OF BIOCHEMISTRY, TUFTS UNIVERSITY, BOSTON, MA

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

03:40–04:00  Evaluation of free radical and non-free radical scavenging antioxidant effects of polyphenols in postprandial lipoproteins  
Fulvio Ursini  
DEPARTMENT OF BIOLOGICAL CHEMISTRY, UNIVERSITY OF PADOVA, PADOVA, ITALY

04:00–04:20  Glucose-6-phosphate dehydrogenase deficiency and oxidative stress in the vasculature  
Joe Loscalzo  
BOSTON UNIVERSITY SCHOOL OF MEDICINE, BOSTON, MA

04:20–04:40  Randomized trials of vitamins by mail: The physicians health study and women’s health study  
Michael Gaziano  
EPIDEMIOLOGY, DEMOGRAPHY AND BIOLOGY PROGRAM, NATIONAL INSTITUTE ON AGING, BOSTON, MA

04:40–05:00  How to develop a clinically relevant antioxidant: α-lipoic acid as an example  
Hans-Jürgen Tritschler  
ASTA MEDICA, FRANKFURT, GERMANY
05:00–05:20  Vitamin E atherosclerosis prevention trial: Findings and perspectives
Howard Hodis
UNIVERSITY OF SOUTHERN CALIFORNIA, SCHOOL OF MEDICINE, LOS ANGELES, CA

05:20–05:40  Effects of vitamin C, alone and in comparison with an antioxidant cocktail, on oxidative markers and C-reactive protein in smokers and passive smokers
Gladys Block
SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF CALIFORNIA, BERKELEY, CA
05:40–06:30  Science & Humanity Prizes  
Introduced by Helmut Sies

Lester Packer  
DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY,  
SCHOOL OF MEDICINE, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

Leopold Flohé  
DEPARTMENT OF BIOCHEMISTRY, TECHNICAL UNIVERSITY OF BRAUNSCHWEIG,  
BRAUNSCHWEIG, GERMANY

06:30–08:00  Refreshments and Poster Viewing

08:00  Banquet

Young Investigator Awards
SESSION IX  OXIDATIVE STRESS IN NEURODEGENERATIVE DISEASES

CHAIRPERSONS  
Jean C. Shih  
DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY,  
SCHOOL OF MEDICINE, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

Moussa Youdim  
TECHNION-FACULTY OF MEDICINE, EVE TOFF AND NPF CENTERS FOR  
NEURODEGENERATIVE DISEASES RESEARCH, DEPARTMENT OF PHARMACOLOGY,  
HAIFA, ISRAEL

09:00–09:20  Parkinson’s disease and oxidative stress  
Moussa Youdim  
TECHNION-FACULTY OF MEDICINE, EVE TOFF AND NPF CENTERS FOR  
NEURODEGENERATIVE DISEASES RESEARCH, DEPARTMENT OF PHARMACOLOGY,  
HAIFA, ISRAEL

09:20–09:40  cDNA microarray gene expression in Parkinson's  
disease and its MPTP model  
Silvia Mandel  
TECHNION–FACULTY OF MEDICINE, EVE TOFF AND US NATIONAL PARKINSON’S  
FOUNDATION CENTERS FOR NEURODEGENERATIVE DISEASES, BRUCE RAPPAPORT  
FAMILY RESEARCH INSTITUTE, HAIFA, ISRAEL

09:40 –10:00  Oxidative and genotoxic stress in the course of  
amyloid peptide-induced neurodegeneration  
Irene Ceballos-Picot  
INSERM U383, HôPITAL NECKER, PARIS, FRANCE

10:00–10:20  Peroxynitrite and dopamine neurodegeneration  
Serge Przedborski  
DEPARTMENTS OF NEUROLOGY AND PATHOLOGY, COLUMBIA UNIVERSITY,  
NEW YORK, NY

10:20–10:40  Break
10:40–11:00 Interaction of hydroxyalkenals with Cu,Zn-superoxide dismutase

Ken Hensley
FREE RADICAL BIOLOGY AND AGING RESEARCH PROGRAM, OKLAHOMA MEDICAL RESEARCH FOUNDATION, OKLAHOMA CITY, OK

11:00–11:20 Lysosomes as proximal messengers of cell death

Ulf Brunk
DEPARTMENT OF PATHOLOGY, UNIVERSITY OF LINKÖPING, LINKÖPING, SWEDEN

11:20–11:40 Retinal neurodegeneration in an in vivo model: Implications for Alzheimer's disease and age-related macular degeneration

Francisco J. Romero
DEPARTMENT OF PHYSIOLOGY, SCHOOL OF MEDICINE, UNIVERSITY OF VALENCIA, VALENCIA, SPAIN

11:40–12:00 Role of lutein in prevention of age-related macular degeneration

Erik van Kuijk
DEPARTMENT OF OPHTHALMOLOGY, UNIVERSITY OF TEXAS MEDICAL BRANCH, GALVESTON, TX

12:00–12:20 Mechanisms of estrogen-induced neuroprotection

Roberta Díaz Brinton
DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY, SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

12:30–2:00 Farewell Lunch
S-ADENOSYLMETHIONINE (SAM-e) SYMPOSIUM

ORGANIZED BY

Klaus Krämer, Carlo di Padova, and Lester Packer
S-ADENOSYLMETHIONINE (SAM-e) SYMPOSIUM

CHAIRPERSONS  
*Lester Packer*  
DEPARTMENT OF MOLECULAR PHARMACOLOGY & TOXICOLOGY,  
SCHOOL OF PHARMACY, UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CA

*Charles S. Lieber*  
LIVER DISEASE & NUTRITION SECTION, ALCOHOL RESEARCH AND TREATMENT CENTER, BRONX VETERANS AFFAIRS MEDICAL CENTER, BRONX, NY

02:00 – 02:30  
SAM-e: From the bench to the bedside–molecular basis of a pleiotropic molecule  
*Teodore Bottiglieri*  
BAYLOR UNIVERSITY MEDICAL CENTER INSTITUTE OF METABOLIC DISEASE, MASS SPECTROMETRY & BIOCHEMICAL DIAGNOSTIC CENTER, DALLAS, TX

02:30 – 03:00  
SAM-e in the treatment of liver disorders  
*Charles S. Lieber*  
LIVER DISEASE & NUTRITION SECTION, ALCOHOL RESEARCH AND TREATMENT CENTER, BRONX VETERANS AFFAIRS MEDICAL CENTER, BRONX, NY

03:00 – 03:30  
Deficient SAM-e synthesis in alcoholic liver cirrhosis: Cause or consequence?  
*José María Mato de la Paz*  
MEDICINA INTERNA, MOLECULAR BIOLOGY OF LIVER DISEASE, PAMPLONA, NAVARRA, SPAIN

03:30 – 03:20  
The role of SAMe in the treatment of depression: A review of the evidence  
*David Mischoulon*  
DEPRESSION CLINICAL AND RESEARCH PROGRAM, MASSACHUSETTS GENERAL HOSPITAL, BOSTON, MA
03:20 – 04:00  EEG/ERP changes in response to SAM-e administration in both young and aged subjects

Bernd Saletu
DEPARTMENT OF PSYCHIATRY, UNIVERSITY OF WIEN, WIEN, AUSTRIA

04:30 – 05:00  Treatment of major depression with SAM-e: results of two recent multi-center controlled trials

Roberto delle Chiaie
THIRD PSYCHIATRIC CLINIC, UNIVERSITY OF ROME "LA SAPIENZA", ROME, ITALY
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