

The 7th Annual International Conference

DOSE-RESPONSE 2008:

**Implications for Toxicology,
Medicine, and Risk Assessment**

*The Annual Meeting of the
International Dose-Response Society*

April 29 - 30, 2008

University of Massachusetts, Amherst, MA

Conference Directors: Edward J. Calabrese, Ph.D., Paul T. Kosteki, Ph.D.



**THRESHOLD • ADAPTIVE • BIDIRECTIONAL • BIPHASIC
HORMETIC • NON-MONOTONIC • U/J-SHAPED • PARADOXICAL**

PLATFORM PRESENTATIONS

TUESDAY, APRIL 29, 2008

Morning

Session I: PLENARY

Moderator: Jonathan Borak, Yale University, New Haven, CT

8:30am **Welcome and Overview**

Edward J. Calabrese, *University of Massachusetts, Amherst, MA*

8:45am **A Perspective on the Scientific, Philosophical, and Policy Dimensions of Hormesis**

George R. Hoffmann, *College of the Holy Cross, Worcester, MA*

9:55am **Break**

10:25am **Superoxide Dismutase and Bell-Shaped Dose Response Curves**

Joe M. McCord, *University of Colorado Denver Health Sciences Center, Denver, CO*

11:30am **Annual Meeting of the International Dose-Response Society**

A. Wallace Hayes, *Harvard School of Public Health*

Noon **Luncheon Amherst Room, 10th Floor Campus Center**

Afternoon

Session II: BIOMEDICAL

Moderator: Bobby Scott, Lovelace Respiratory Research Institute, Albuquerque, NM

1:00pm **Induction of the Redox Protein Thioredoxin Mediating the Hormetic Response of Preconditioning-induced Neuroprotection.**

Chuang C. Chiueh, *Taipei Medical University, Taipei City, Taiwan*

Chien Y. Huang, *Taipei Medical University, Taipei City, Taiwan*

Kai C. Chang, *Taipei Medical University, Taipei City, Taiwan*

1:30pm **Heme Oxygenase-1 and Carbon Monoxide as Novel Anti-Inflammatory Molecules**

Leo E. Otterbein, *Harvard Medical School, Boston, MA*
Beek Yoke Chin, *Harvard Medical School, Boston, MA*

2:00pm **Mild Heat Stress Slows Down Aging, Increases Wound Healing, and Enhances Angiogenesis in Human Cells**

Suresh Rattan, *University of Aarhus, Denmark*

2:30pm **A Summary of Dose-Response Models and Estimation in Developmental Toxicity Studies**

Daniel L. Hunt, *St. Jude Children's Research Hospital, Memphis, TN*

Shesh N. Rai, *University of Louisville, Louisville, KY*

Chin-Shang Li, *University of California, Davis, CA*

3:00pm **Separating Stimulant and Impairing Functions in Hormetic Profiles with Independent Component Analysis (ICA)**

David B. Newlin, *RTI International, Baltimore, MD*

Phillip A. Regalia, *Catholic University of America, Washington DC*

Edward J. Calabrese, *University of Massachusetts, Amherst, MA*

3:30pm **Break**

4:00pm **Hormetic and Non-Hormetic Dose-Responses in Emotional Neuroscience**

David M. Diamond, *University of South Florida, Tampa, FL*
Philip R. Zoladz, *University of South Florida, Tampa, FL*

4:30pm **Is Possible for LDR Able to Induce Hormetic Effect on Normal Cell Growth, but not Human Tumor Cell Growth? Clinical Implication**

Lu Cai, *University of Louisville School of Medicine, Louisville, Kentucky*

5:00pm **Genetic Dissection of Hormesis: Ponce d'elegans**

Thomas E. Johnson, *University of Colorado at Boulder, Boulder, CO*

James A. Cypser, *University of Colorado at Boulder, Boulder, CO*

Deqing Wu, *University of Colorado at Boulder, Boulder, CO*

Pat Tedesco, *University of Colorado at Boulder, Boulder, CO*

Sang-Kyu Park, *University of Colorado at Boulder, Boulder, CO*

Junji Mitsushita, *University of Colorado at Boulder, Boulder, CO*

Takamasa Ishii, *University of Colorado at Boulder, Boulder, CO*

6:30pm **Dinner and Dose-Response Society Awards Presentation**

Amherst Room, 10th Floor, Campus Center

PLATFORM PRESENTATIONS

WEDNESDAY, APRIL 30, 2008

Morning

Session III: TOXICOLOGY

Moderator: Suresh Rattan, *University of Aarhus, Denmark*

8:30am **Antibiotics Have Dual Modes of Action**
Julian Davies, *University of British Columbia, Vancouver BC*

9:00am **The Diverse Effects of Arsenic on Human DNA Repair: Implications for Risk Assessment.**
Peter Sykora, *Deakin University, Melbourne, Australia*
Elizabeth T. Snow, *University of Tasmania, Launceston, Tasmania, Australia*

9:30am **The Polyacetylenes Falcarinol and Falcarindiol Affect Stress Responses in Myotube Cultures in a Biphasic Manner**
Jette F. Young, *University of Aarhus, Tjele, Germany*
Lars P. Christensen, *University of Aarhus, Tjele, Germany*
Peter K. Thell, *University of Aarhus, Tjele, Germany*
Niels Oksbjerg, *University of Aarhus, Tjele, Germany*

10:00am **Break**

10:30am **U-shaped Dose-responses at Low Doses: Explanation with a New Model for in vitro Neoplastic Transformation**
Helmut Schöllnberger, PhD., *University of Salzburg, Salzburg, Austria*
Ronald E.J. Mitchtel, *Chalk River Laboratories, Chalk River, ON, Canada*

11:00am **Hormesis without Cell Killing in a Competing-Risks Model of Carcinogenesis**
Louis Anthony (Tony) Cox, Jr., *Cox Associates, Denver, CO*

11:30am **Complex Mixture-associated Hormesis and Toxicity: The Case of Leather Tanning Industry**
Giovanni Pagano, *Italian National Cancer Institute, Mercogliano, Italy*
Giuseppe Castello, *Italian National Cancer Institute, Mercogliano, Italy*
Marialuisa Gallo, *Campania Regional Environmental Protection Agency, Naples, Italy*
Ilaria Borriello, *Federico II Naples University, Naples, Italy*
Marco Guida, *Federico II Naples University, Naples, Italy*

Noon **Luncheon Amherst Room, 10th Floor Campus Center**

Afternoon

Session IV: BIOTERRORISM, LOW DOSE EFFECTS AND HORMESIS

Moderators: Nicholas Dainiak, *Bridgeport Hospital, Bridgeport, CT*
Carmel Mothersill, *McMaster University, Hamilton, ON, Canada*

1:00pm **Local, Regional and National Responses for Medical Management of a Radiological/Nuclear Incident**
Nicholas Dainiak, MD, *Bridgeport Hospital, Bridgeport, CT*

1:30pm **Low-Dose-Radiation-Activated Natural Protection against Cancer and Other Diseases**
Bobby R. Scott, *Lovelace Respiratory Research Institute, Albuquerque, NM*

2:00pm **Mechanisms of Bystander Effects which Could Underlie Hormetic Effects Following Low Dose Exposure**
Carmel Mothersill, *McMaster University, Hamilton, ON, Canada*

2:30pm **Break**

3:00pm **The Cutaneous Radiation Reaction at the Molecular Level**
V. Meineke, *Bundeswehr Institute of Radiobiology, Munich, Germany*

3:30pm **Discussion Panel: Science and Values in Bioterrorism Response - Is the Science Useful or Important?**
Wayne Jonas, Chair, *Samueli Institute for Information Biology, Alexandria, VA*
Nicholas Dainiak, *Bridgeport Hospital, Bridgeport, CT*
Victor Meineke, *Bundeswehr Institute of Radiobiology, Munich, Germany*
Carmel Mothersill, *McMaster University, Hamilton, ON, Canada*
Deborah Oughton, *Norwegian University of Life Sciences, Aas, Norway*
Bobby R. Scott, *Lovelace Respiratory Research Institute, Albuquerque, NM*
Colin Seymour, *McMaster University, Hamilton, ON, Canada*

*The International Dose-Response Society is proud to announce the recipients of the annual awards for **Outstanding Leadership**, **Outstanding Career Achievement** and **Outstanding New Investigator**.*

*These awards are presented to individuals in each category who have made outstanding contributions to the field of **Dose Response**. The awards committee selecting the recipients was Helmut Hirsch, University at Albany, Ken Mundt, Environ, and Barbara Callahan, University Research.*

*This year's awards go to **Bobby Scott** for Outstanding Leadership, **Lu Cai** for Outstanding Career Achievement and **Sergio Parra** for Outstanding New Investigator. Congratulations to all.*

2008 INTERNATIONAL HORMESIS SOCIETY AWARDS

AWARDEE PROFILE: LEADERSHIP

Bobby Scott



Dr. Bobby Scott received a B.S. in physics from the Southern University, Baton Rouge, Louisiana, a M.S. in physics from the University of Illinois at Urbana, Illinois, and a Ph.D. in biophysics also from the University of Illinois. His research career mainly has focused on developing predictive models for characterizing the risk for deterministic and stochastic radiobiological effects. Dr. Scott's interest in radiation research originated during high school in connection with conducting an experiment on radiation mutagenic effects in fruit flies at Webster High, Minden, Louisiana. This interest continued through undergraduate and graduate school, leading to a theoretical Ph.D. thesis entitled "A Mechanistic State Vector Model for the Interaction of Ionizing Radiation with Cells" that was achieved under his advisor Professor Howard S. Ducoff. Professor Ducoff was one of the first to conduct experimental studies of radiation hormesis, and as a student Dr. Scott contributed to this work. Dr. Scott conducted his postdoctoral research related to modeling of radiation-induced life shortening at the Biology Division of Argonne National Laboratory. After completing his postdoctoral work he joined Lovelace Respiratory Research Institute (LRRI, then the Inhalation Toxicology Research Institute), where he is now a Senior Scientist. At LRRI, he developed a theoretical hazard-function model for quantifying radiation lethality and morbidity risks after large radiation doses. This model currently is used internationally for radiological incident risk assessment and was recently discussed in a paper in the journal *Dose-Response*. The paper addressed the nonlinear health risk from ingesting polonium-210, which related to the Litvinenko incident in London. Presently, his research focuses mainly on developing biological-based models that explain radiation hormesis at the molecular, cellular, and organ and/or tissue levels. Dr. Scott has been an active participant in the International Dose-Response Society for several years, both with respect to organizing and moderating conference sessions as well as keeping colleagues around the world informed about new developments in the field. Among his more than 100 scientific publications, over 20 relate to radiation and chemical hormesis.



Lu Cai

Lu Cai received his MD in 1983, and Ph.D. in 1990 from Jilin University in China, followed by a postdoctoral training at University of Western Ontario in 1993, and McGill University in 1995, Canada. He is currently an Associate Professor, Departments of Medicine and Radiation Oncology, the University of Louisville, and also Visiting Professor and Director, Chinese-American Institute for Diabetic Complications, Wenzhou Medical College, China.

Since 1990, Lu has concentrated his interests in the biological effect of low-dose radiation (LDR) under the supervision of Dr. Shuzheng Liu, a well-known Chinese Radio-Biologist. The unique feature of Lu's interests in LDR effect is its impact on public health and medical application. Lu is one of the first persons to investigate whether LDR adaptive response occurs in male germ cells *in vivo* (Int J Radiat Biol 1990), which was followed by several other important papers in the same field (Mutation Res 1993,1994; Mutagenesis 1995; Radiation Res 2006; Critical Review in Toxicology 2007). Later, he further extended LDR-induced hormesis and adaptive responses into hematology, showing the induction of hormetic and adaptive response in the hemopoietic system, with several important publications in Radiation Res (1995) and Toxicological Sciences (2000). The studies demonstrated for the first time that LDR can partially replace stem cell stimulating factor, G-CSF, to stimulate and mobilize hematopoietic progenitor cells (HPCs) into peripheral blood, and they further proved that the mobilized HPCs are able to rescue lethally irradiated recipient mice (Exp Hematology 2004). More recently, the studies further demonstrated the significant difference of normal human tissues from human tumor cells in response to LDR *in vitro* and *in vivo* (Radiation Res 2008, in press; J Radiation Res 2008, in press). Meanwhile, Dr. Cai is also pursuing to apply LDR's hormestic and adaptive mechanisms into prevention or intervention of diabetes and diabetic complications. His work on diabetic complications has made a great contribution to the field of diabetes research, publishing several important papers in JBC (2000), Diabetes (2002, 2005), Am J Pathol (2004,2005), J Am Coll Cardiol (2006, 2008), Free Rad Biol Med (2006) and Circulation (2006).



Sergio Parra

I was born on January 5, 1974 in Medellín, Colombia. At age seventeen I went to the Universidad de Antioquia pursuing a career in medicine, ultimately becoming a physician. Throughout my college years I had the honor to rank in the 5th position among last year's Colombian students of medicine, and rank in the 2nd position among 78 students of medicine. Soon after finishing my studies in medicine, I started my training as a pharmacologist. During this time, I was involved in a project evaluating the relationship between a polymorphism in the b1 adrenergic receptors and the

clinical response to a selective antagonist for them. By the end of 2004 I went to Houston, Texas, to work in the Laboratory of Dr. Richard Bond, at the University of Houston, as a postdoctoral fellow. By the end of that same year Dr. Bond gave me the opportunity to visit Professor Clive Page's Laboratory in London, United Kingdom, through the Texas / United Kingdom Collaborative Research Initiative award. That same year I was given a grant to attend to the British Pharmacological Society meeting in Newcastle. My work in Houston was about the taboo idea of using beta-blockers in asthma. There, using a mouse model of this disease and in a small clinical trial, we were able to demonstrate paradoxical and unthinkable effects of these drugs after its chronic administration in both animals and humans.

By the beginning of 2007, I got married and decided to come back to Colombia, where I got tenure as a Professor in the Universidad de Antioquia. In October 2007 the University sent me to Nagasaki, Japan, to take a course on research and development of products to meet public health needs. Now, I am involved in several projects, some of which are related with the development of drugs to treat neglected diseases in my country (i.e. Chagas disease, leishmaniasis, and malaria), and some others about pharmacogenetics.

ANNOUNCEMENT

8th International Conference

DOSE-RESPONSE 2009: IMPLICATION FOR TOXICOLOGY, MEDICINE AND RISK ASSESSMENT

The Annual Meeting of the International Dose-Response Society

APRIL 28 - 29 2009

University of Massachusetts at Amherst

- *Adaptive • Bidirectional • Biphasic • Hormetic • Non-Monotonic • Yerkes-Dodson Law (Psychology)*
- *U-Shaped • J-Shaped • Subsidy-Stress Gradient (Ecology) • Reverse Dose-Responses*

TOPICS WILL INCLUDE:

- Molecular mechanisms
- Pharmacological effects
- Chemical and radiation toxicology
- Risk assessment implications
- Low-dose modeling
- Evolutionary foundations
- Ecological effects
- Clinical/therapeutic effects
- Psychological/behavioral responses
- Bioengineering processes
- Exercise science
- Epidemiology of low doses
- Industrial hygiene
- Legal implications

Please visit our website for more information, Abstract Submission Guidelines and Abstract Submission

www.dose-response.org

For further information contact

Edward J. Calabrese, Ph.D. or Paul T. Kostecki, Ph.D.

Environmental Health Sciences • Morrill I, N344 • University of Massachusetts Amherst, MA 01003

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DEADLINE FOR ABSTRACTS December 8, 2008

INTERNATIONAL DOSE-RESPONSE SOCIETY MEMBERSHIP

The INTERNATIONAL DOSE-RESPONSE SOCIETY is a professional society designed to enhance understanding of the nature of the dose response and its implications for science and society. Those individuals with a professional interest in these areas are invited to join the Society. Applications for membership can be found at **www.dose-response.org** or on the next page.

Membership in the International Dose-Response Society Includes:

- Subscription to the Quarterly Electronic Journal Dose-Response
- Keyword, Author, and Subject "Active Searches" with Email Notification for all Dose-Response Articles in Particular and All MetaPress Articles in General

- 25% discount to the Annual International Dose-Response Society Conference 2009
- Member-only access to past conference PowerPoint Presentations
- Email notification when the newest Society e-newsletter, "BELLE Newsletter" (Biological Effects of Low-Level Exposure), is published online
- Annual Membership Fees (In US Funds)

Please note that all 2007 memberships expire on June 30, 2008

INTERNATIONAL DOSE-RESPONSE SOCIETY
2008 Membership Form for New and Renewing Members

Please choose one membership category (Payment in US Funds):

- | | | |
|--------------------------|--------------------------|---|
| Individual Membership | <input type="checkbox"/> | \$125-1 year |
| Individual Membership | <input type="checkbox"/> | \$225-2 years |
| Retiree Membership | <input type="checkbox"/> | \$75-1 year |
| Retiree Membership | <input type="checkbox"/> | \$125-2 years |
| Post-Graduate Membership | <input type="checkbox"/> | \$75-1 year (up to three years post-graduation) |
| Post-Graduate Membership | <input type="checkbox"/> | \$125-2 years (up to three years post-graduation) |
| Student Membership | <input type="checkbox"/> | \$10-1 year |
| Student Membership | <input type="checkbox"/> | \$15-2 years |
| Sustaining Member | <input type="checkbox"/> | \$1000/year |
| Corporate Membership | <input type="checkbox"/> | \$5000/year |

Renewal Membership New Membership

Please type or print clearly in ink only:

Last Name: _____ Middle Initial(s): _____

First Name: _____ Date of Birth: _____

Title: _____

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Organization

Department

Street/P.O. Box

City _____ State _____

Postal Code _____ Country _____

Telephone: _____ / _____ / _____
country code area code number

Fax: _____ / _____ / _____
country code area code number

Email Address: _____

Payment (check one credit card type):

American Express Master Card Visa Discover Check (Payable to Univ. of Mass. Dose-Response)

Account Number _____ Expiration Date _____

Completed application forms should be mailed, emailed or faxed to:

Dose-Response/BELLE Offices

Environmental Health Sciences Program, School of Public Health

Morrill 1, Room N344

University of Massachusetts

Amherst, MA 01003

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