

The 8th Annual International Conference on

DOSE-RESPONSE 2009:

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

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

April 28-29, 2009

University of Massachusetts, Amherst, MA

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



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

PLATFORM PRESENTATIONS

TUESDAY, APRIL 28, 2009

Morning

Session I: PLENARY

Moderator: George Hoffmann, *Holy Cross, Worcester, MA*

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|---------|---|---------|--|
| 8:15am | Greeting | 10:30am | Adaptive Responses to Oxidative Stress: Particularly the RCAN1 Gene
Kelvin J. A. Davies, <i>University of Southern California, Los Angeles, CA</i> |
| 8:30am | Hormesis and Its Potential Implications for the Pharmaceutical Industry
Kenneth Maynard, <i>Sanofi-aventis, US, Inc., Bridgewater, NJ</i> | 11:15am | Three Barriers Block Damage from Low-Dose Irradiation
Ludwig E. Feinendegen, M.D., <i>University Düsseldorf, Germany</i>
Myron Pollycove, <i>University of California San Francisco, San Francisco, CA</i>
Ronald D. Neumann, <i>The National Institutes of Health, Bethesda, MD</i> |
| 9:15am | Adaptive Responses and Risk - Yeast to the Clinic
Douglas R. Boreham, <i>McMaster University, Hamilton, ON, Canada</i> | Noon | Lunch |
| 10:00am | Break | | |

Afternoon

Session II: BIOMEDICAL

Moderator: Mark Mattson, *National Institute on Aging Intramural Research Program, Baltimore, MD*

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|--------|---|--------|---|
| 1:00pm | Stimulating Hormetic Signaling Pathways to Improve Brain Health
Mark P. Mattson, <i>National Institute on Aging Intramural Research Program, Baltimore, MD</i> | 3:00pm | Break |
| 1:30pm | Vitagenes, Cellular Stress Response and Acetylcarnitine: Relevance to Hormesis
Vittorio Calabrese, <i>Carolin Cornelius, University of Catania, Catania, Italy</i>
Albena T. Dinkova-Kostova, <i>University of Dundee, Scotland, UK and Johns Hopkins University School of Medicine, Baltimore, MD</i>
Edward J. Calabrese, <i>University of Massachusetts, Amherst, MA</i> | 3:30pm | Mimetics of Hormetic Agents Offer Interventions in Aging, Disease, and Trauma
Joan Smith-Sonneborn, <i>University of Wyoming, Laramie, WY</i> |
| 2:00pm | Hormetic Immune Signaling Initiates Neurological Preventative Health
Richard Kraig, Heidi Mitchell, <i>The University of Chicago Medical Center, Chicago, IL</i>
Barbara Christie-Pope, <i>Cornell College, Mt. Vernon, IA</i>
David M. White, Phillip E. Kunkler, <i>The University of Chicago Medical Center, Chicago, IL</i> | 4:00pm | Resveratrol, a Polyphenolic Antioxidant Present in Red Wine, is Dose-Dependent in Delivering Cardioprotection
Jocelyn I. Dudley, Subvendu Mukherjee and Dipak K. Das, <i>Cardiovascular Research Center, University of Connecticut School of Medicine, Farmington, CT</i> |
| 2:30pm | The Rational Design of Therapeutic Antioxidants: Free Radical Trapping Activity and the Dose-Response Relationship
James J. Ley, <i>University of Miami, Miami, FL</i> | 4:30pm | Biphasic Dose Response in Low Level Light Therapy
Ying-Ying Huang MD, <i>Harvard Medical School, Boston, MA and Guangxi Medical University, Nanning, Guangxi, China</i>
Aaron C-H Chen MS, <i>Boston University School of Medicine, Boston, MA</i>
Michael Hamblin, <i>Harvard Medical School, Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA</i> |
| | | 5:00pm | Methylene Blue Dose-Response: Implications for Toxicology and Medicine
Francisco Gonzalez-Lima, <i>The University of Texas at Austin, Austin, TX</i> |

6:30pm SOCIAL & DINNER

PLATFORM PRESENTATIONS (cont.)

WEDNESDAY, APRIL 29, 2009

Morning

Session I: BIOMEDICAL (cont.)

Moderator: Mark Mattson, *National Institute on Aging Intramural Research Program, Baltimore, MD*

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|--------|---|---------|---|
| 8:30am | Implications for Drug Development of the U-shaped Dose Response Curve Frequently Observed with Anti-angiogenic Drugs
Andrew P. Mazar, Ph.D., <i>Attenuon, LLC, Evanston, IL</i> | 9:30am | Inhibitors of Angiogenesis Can Exhibit Bell-Shaped or U-Shaped Dose-Response Curves: Relevance for Cancer Therapy
Andrew R. Reynolds, <i>Breakthrough Breast Cancer Research Centre, Institute of Cancer Research, London, UK</i>
Jim C. Norman, <i>Beatson Institute for Cancer Research, Glasgow, UK</i>
Gordon C. Tucker, <i>Institut de Recherches Servier (IdRS), Croissy-sur-Seine, France</i>
Kairbaan M. Hodivala-Dilke, <i>Barts & The London School of Medicine & Dentistry, London UK</i> |
| 9:00am | The Hormetic Morphogen Theory of Curvature and the Morphogenesis and Pathology of Tubular and other Curved Structures
Egil Fosslie, <i>University of Illinois at Chicago, Chicago, IL</i> | 10:00am | Break |

Session II: TOXICOLOGY

Moderator: Colin Seymour, *McMaster University, Hamilton, ON, Canada*

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|---------|---|---------|---|
| 10:30am | Selenium, Apoptosis, and DNA Damage: Defining the Optimal Selenium Dose for Human Prostate Cancer Prevention
David Waters, <i>Purdue University, West Lafayette, IN</i>
Shuren Shen, Seema S. Kengeri, <i>The Gerald P. Murphy Cancer Foundation, West Lafayette, IN</i>
Emily C. Chiang, <i>Purdue University Interdepartmental Nutrition Program; and The Gerald P. Murphy Cancer Foundation, West Lafayette, IN</i>
Huiping Xu, <i>Purdue University, Department of Statistics, West Lafayette, IN</i>
Gerald F. Combs, Jr., <i>USDA, ARS Grand Forks, ND</i>
J. Steven Morris, <i>University of Missouri-Columbia Research Reactor Center, Columbia, MO</i>
David G. Bostwick, <i>Bostwick Laboratories, Richmond, VA</i> | 11:00am | Predicting Low Dose Effects for Chemicals in High Through-Put Studies
Edward J. Stanek III, Edward J. Calabrese, <i>University of Massachusetts, Amherst, MA</i> |
| | | 11:30am | Hormesis and Radiation-Induced Neoplastic Transformation In Vitro: The Role of Radiation Dose-Rate
Leslie Redpath, <i>University of California Irvine, Irvine, CA</i> |
| | | Noon | Lunch |

Afternoon

Session III: TOXICOLOGY (cont.)

Moderator: Colin Seymour, *McMaster University, Hamilton, ON, Canada*

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|--------|--|--------|---|
| 1:00pm | Translationally Controlled Tumor Protein (TCTP) Participates in the Protective Effects of Low Dose γ-Rays
Jie Zhang, <i>UMDNJ-New Jersey Medical School, Newark, NJ, Fourth Military Medical University, Xian, P. R. China</i>
Sonia de Toledo, <i>UMDNJ-New Jersey Medical School, Newark, NJ</i>
Guozheng Guo, <i>Fourth Military Medical University, Xian, P. R. China</i>
Edouard Azzam, <i>UMDNJ-New Jersey Medical School, Newark, NJ</i> | 2:00pm | Feedback/Feedforward Homeostatic Control and Hormesis
Qiang Zhang, <i>The Hamner Institutes for Health Sciences, Durham, NC</i>
Jingbo Pi, Courtney G. Woods, Melvin E. Andersen, <i>The Hamner Institutes for Health Sciences, Research Triangle Park, NC</i> |
| | | 2:30pm | On the Death of Threshold
Janet Kester, <i>NewFields St. Louis, Wentzville, MO</i> |
| 1:30pm | Systems Biology and Non targeted Effects of Low Radiation Doses
Carmel Mothersill, Colin Seymour, <i>McMaster University, Hamilton, Ontario, Canada</i> | 3:00pm | Hormesis Knowledge and Opinion Survey Results
Amy Jones, <i>Lockheed Martin Corporation, Bethesda, MD</i>
D.L. Anderton, E.J. Stanek, E. J. Calabrese, <i>University of Massachusetts, Amherst, MA</i> |

2009 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

OVERVIEW

*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 Barbara Callahan, University Research, Helmut Hirsch, University at Albany, Ken Mundt, Environ.*

*This year's awards go to **Jim Muckerheide** for Outstanding Leadership, **Ludwig Feinendegen** for Outstanding Career Achievement and **Regina Belz** for Outstanding New Investigator. Congratulations to all.*

2009 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

AWARDEE PROFILE: LEADERSHIP



Jim Muckerheide

Massachusetts State Nuclear Engineer - since 1990
President, Radiation, Science, and Health - since 1996
Co-Director, Center for Nuclear Technology and Society at Worcester Polytechnic Institute, Worcester MA – 1997-2006

Mr. Muckerheide was Senior Engineer and Project Manager in design, construction, safety analysis, licensing, and environmental and health effects for nuclear power; he was an independent consultant on ERDA/DOE Nuclear Waste Management Programs, Regulatory Affairs, and TMI Lessons-Learned and Management Response.

As head of Engineering Services managing A/E and engineering contractors he: developed utility engineering capacity to assume engineering control, engineered and developed document control systems and comprehensive configuration management programs integrating design, construction, operations, training, and document control.

He performed NRC regulatory actions for Pilgrim, Vermont Yankee, and Seabrook; he was the NRC State Liaison Officer designee and was on the Massachusetts Governor's Advisory Council on Radiation Protection producing data demonstrating that low dose radiation is not harmful. He teaches nuclear courses at Worcester Polytechnic Institute, Worcester MA.

He is the president of Radiation, Science, and Health an international non-profit of independent experts applying science to health effects to change radiation protection policy in the public interest.

Mr. Muckerheide was the co-director (1997-2006) of The Center for Nuclear Technology and Society at Worcester Polytechnic Institute, Worcester, MA which conducts research and education on public policies and the benefits and costs of nuclear technologies on public decision processes that fail to make effective decisions on objective technical and public interest analyses.



Ludwig Feinendegen

Feinendegen, Ludwig Emil, M.D. Internal Medicine, Nuclear Medicine, Radiation Biology.

Education: Cologne University, Germany, M.D. 1947-52. - Postgraduate medical training in Germany and USA, 1952-58 (Ventnor Foundation 1953-55).

Current Position: Professor (emeritus), Nuclear Medicine, Heinrich-Heine University Düsseldorf, Germany, 1993- . - Research Collaborator, Brookhaven National Laboratory, Upton, NY, USA, 1998-.

Research Areas: Molecular nuclear medicine, radiation-biology. - More than 670 publications including book chapters, monograph, textbook.

Professional Employment: Research Associate 1958-1963, Research Collaborator, 1963-1993, Senior Scientist and Research Associate 1993-98, Research Collaborator 1998-Present, Brookhaven National Laboratory
Scientific Officer, Headquarters European Community, Brussels, Belgium, 1963-1964
Research Associate, Institut du Radium, Laboratoire Pasteur, Paris, France, 1964-1967
Full Professor and Director, Department of Nuclear Medicine, Heinrich-Heine University Düsseldorf and Institute of Medicine, Research Center Jülich, Germany, 1967-1993, Professor emeritus, 1993-Present
Assignee and Program Manager, US Department of Energy, Washington, DC, USA, 1994-98
Fogarty Scholar National Institutes of Health, Bethesda, MD, USA, 1998-1999
Consultant, NIH, Department of Nuclear Medicine, 2000-08.

Professional Affiliations (selection): Northrhine-Westfalian Academy of Sciences, Düsseldorf, Germany; 1971-Present
Advisory Council to the Federal Minister of Health, Bonn, Germany, 1972-1993 International Commission on Radiological Protection, Committee 2, Chilton, England, 1973- 85
Civil Defense Commission of the Federal Minister of the Interior, Bonn-Berlin, Germany, 1974-99; member emeritus, 1999 –Present
President, European Society for Radiation Biology, 1977-1978
Council for Science and Literature, Goethe Institute, Munich, Germany, 1978-1987
Council for the Meetings of Nobel Laureates in Lindau, Germany 1979-2005 International Commission on Radiation Units and Measurements, Bethesda, MD, USA, 1982-2006
Scientific Council for Military Medicine, Federal Minister of Defense, Bonn-Berlin, Germany, 1983-2007.

AWARDEE PROFILE: NEW INVESTIGATOR ACHIEVEMENT



Regina Belz

Dr. Belz studied Agricultural Engineering with specialization in plant production at the University of Hohenheim (1992-1998), in Stuttgart, Germany. Her diploma thesis dealt with the release of phytotoxins from plant mulches and its use for practical weed control. This was the first time she encountered with dose-response studies and the phenomenon of hormesis caused by plant phytotoxins. Her diploma thesis was awarded with the 'Wilhelm-Rimpau-Award' of the German Agricultural Society (DLG) in 2000.

From 1999-2004 she worked on her doctoral thesis at the University of Hohenheim, Department of Weed Science, on biochemical plant interference mediated by crop produced phytotoxins against weeds and its use for weed control. This was the second time she got into contact with hormesis as some of the crop plant metabolites involved stimulated weed growth at low doses. Her doctoral research was awarded with the 'Rice Award' of the International Allelopathy Society (IAS) in 2002.

Since she finished her thesis in 2004 she has been a research scientist and lecturer at the University of Hohenheim, Department of Weed Science. Her research focus is still natural plant metabolites and their use for weed control, including biochemical interference of crops against weeds, biochemical interference of invasive weed species and its contribution to invasiveness, as well as mathematical modeling of the biological effects. As some of the plant metabolites involved in these interactions show hormesis, she started to work on hormesis in plants induced by natural phytotoxins or their mixtures and the modeling of such effects in 2005. Since that time, she has published several original papers on her research of hormesis in plant biology including hormetic effects in allelopathy research and in mixtures.

Her current research focus is the variability of hormetic effects depending on environmental conditions and the hormetic mode of action of a natural phytotoxin.

ANNOUNCEMENT

The 9th International Conference on
**DOSE-RESPONSE 2010: IMPLICATIONS FOR
TOXICOLOGY, MEDICINE, AND RISK ASSESSMENT**
The Annual Meeting of the International Dose-Response Society
APRIL 27-28, 2010

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

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

Phone: (413) 545-3164 • FAX: (413) 545-4692 • edwardc@schoolph.umass.edu

DEADLINE FOR SUBMISSION - December 15, 2009

E-mail to dleonard@schoolph.umass.edu

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.

As part of the INTERNATIONAL DOSE-RESPONSE SOCIETY membership, each member will receive a

subscription to the e-journal Dose-Response, which is a peer-reviewed quarterly journal. In addition, there is a Society Newsletter developed for the membership. Members will receive a 25% reduction in registration fees to Dose-Response 2009: Implications for Toxicology, Medicine, and Risk Assessment, the Annual Meeting of the International Dose-Response Society.

To Become a Member, Visit **www.dose-response.org**

INTERNATIONAL DOSE-RESPONSE SOCIETY

2009 Membership Form for New and Renewing Members

Renewal Membership New Membership

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

- Individual Membership \$125–1 year
Individual Membership \$225–2 years
Retiree Membership \$75–1 year
Retiree Membership \$125–2 years
Post-Graduate Membership \$75–1 year (up to three years post-graduation)
Post-Graduate Membership \$125–2 years (up to three years post-graduation)
Student Membership \$10–1 year
Student Membership \$15–2 years
Sustaining Member \$1000/year
Corporate Membership \$5000/year

Please type or print clearly in ink only:

Last Name: _____ Middle Initial(s): _____

First Name: _____ Date of Birth: _____

Title: _____

Address: _____

Organization

Department

Street / P.O. Box

City: _____ State: _____

Country: _____ Postal Code: _____

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

Telephone: 413-545-3164 • Fax: 413-545-4692 • Email: Sorensen@ehs.umass.edu