

The 12th Annual International Conference on

DOSE-RESPONSE 2013:

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

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

April 23-24, 2013

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**

2013 SPONSORS:

*ExxonMobil Foundation • Air Force Office of Scientific Research (AFOSR) FA9550-13-1-0047
Samueli Institute and Department of Defense*

PLATFORM PRESENTATIONS

TUESDAY, APRIL 23, 2013

Morning

8:45am **Welcome**

Session I: PLENARY

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

9:00am **Non-ionizing, Electromagnetic Stimulation of Hormetic Responses: Fact or Fancy?**
Walter Kozumbo, *University of Massachusetts, Amherst, MA*

9:45am **Epigenetic Responses to Low Dose Radiation**
Randy L. Jirtle, *University of Wisconsin-Madison, Madison, WI*

10:30am **Break**

11:00am **Molecular Signatures of Adaptive Stress Responses**
Reinhard Wetzker, *Jena University Hospital, Jena, Germany*

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

Afternoon

Session II: RADIATION/ENVIRONMENT

Moderator: Jerry Cuttler, *Cuttler & Associates Inc., Mississauga, ON, Canada*

1:00pm **Precious Knowledge: The Linear Concentration-Response Non-Threshold Model as the Golden Ratio**
Aalt Bast, *Maastricht University, The Netherlands*, Jaap C. Hanekamp, *Roosevelt Academy, Middelburg, The Netherlands*

1:40pm **Nonlinear Effects of Nanoparticles: Biological Variability from Hormetic Doses, Small Sizes, and Dynamic Adaptive Interactions.**
Iris R. Bell, *University of Arizona College of Medicine, Tucson, AZ*
John A. Ives, *Samueli Institute, Alexandria, VA*
Wayne B. Jonas, *Samueli Institute, Alexandria, VA*

2:10pm **Twenty-Four Months Eating Radium**
Carmel Mothersill, *McMaster University, Hamilton, ON, Canada*,
RW Smith, *McMaster University, Hamilton, ON, Canada*,
D Lariviere, *Laval University, Quebec City, Canada*,
CB Seymour, *McMaster University, Hamilton, ON, Canada*

2:40pm **The p53/NFkB-Mediated Metabolic Response to Irradiation**
Rajuli Lall, Suthakar Ganapathy and Zhi-Min Yuan, *Harvard University School of Public Health, Boston, MA*

3:10pm **~400-fold Natural Background Radiation Does Not Induce Detectable DNA Damage *in vivo***
Werner Olipitz, Dominika Wiktor-Brown, Joe Shuga, Bo Pang, Jose McFaline, Pallavi Lonka, Aline Thomas, James T. Mutamba, *Massachusetts Institute of Technology, Cambridge, MA*,
Joel S. Greenberger, *University of Pittsburgh, Pittsburgh, PA*,
Leona D. Samson, Peter C. Dedon, Jacquelyn C. Yanch, Bevin P. Engelward, *Massachusetts Institute of Technology, Cambridge, MA*

3:40pm **Break**

4:00pm **The Importance of Radiation Dose-Rate**
Jacqueline Yanch, *MIT, Cambridge, MA*

4:30pm **Hormesis, Guilt and Market Science**
Colin Seymour, *McMasters University, Hamilton, ON, Canada*

TUESDAY EVENING

POSTER SESSION & SOCIAL

5:00pm – 6:30pm • 10th Floor Campus Center

DINNER 6:30pm • Amherst Room, 10th Floor Campus Center

PLATFORM PRESENTATIONS (cont.)

WEDNESDAY, APRIL 24, 2013

Morning

Session I: BIOMEDICAL I

Moderator: Jaap Hanekamp, *Roosevelt Academy, Middelburg, The Netherlands*

- | | | | |
|--------|--|---------|--|
| 8:00am | The Importance of Dose Response for the Biology of Synthetic Triterpenoids
Karen Liby, <i>Dartmouth, Hanover, NH</i> | 10:00am | Break |
| 8:30am | Testing the Hormesis Hypothesis of Dietary Restriction
Chris Hine and Jay Mitchell, <i>Harvard School of Public Health, Boston, MA</i> | 10:30am | The Brain, Energy Metabolism and Hormetic Pathways to Optimal Health
Mark Mattson, <i>National Institute on Aging Intramural Research Program, Baltimore, MD</i> |
| 9:00am | Nutrient Overload and Divergence in Adaptive Redox Responses between Heart and Skeletal Muscle
Ethan Anderson, <i>East Carolina University, Greenville, NC</i> | 11:00am | Central Role of the Brain in Stress and Adaptation: Allostasis and Allostatic Load
Bruce S. McEwen, <i>The Rockefeller University, New York, NY</i> |
| 9:30am | Molecular Events in Biophasic Non-genomic Estrogen and Antiestrogen Signaling
Xintian Zhang and Zhaoyi Wang, <i>Creighton University Medical School, Omaha, NE</i> | Noon | Lunch
Amherst Room, 10th Floor Campus Center |

Afternoon

Session II: BIOMEDICAL II

Moderator: Jay Mitchell, *Harvard School of Public Health, Boston, MA*

- | | | | |
|--------|--|--------|--|
| 1:00pm | Astrocyte Plasticity Revealed by Adaptations to Severe Proteotoxic Stress
Rehana Leak, Amanda M. Titler, Jessica M. Posimo, <i>Duquesne University, Pittsburgh, PA</i> | 2:00pm | Antibiotic-induced Biofilm Formation
Jeffrey Kaplan, <i>American University, Washington DC</i> |
| 1:30pm | Non-Monotonic Dose Responses in Studies of Endocrine Disrupting Chemicals: Bisphenol A as a Case Study
Laura Vandenberg, <i>Tufts University, Medford, MA</i> | 2:30pm | Application of the Disregulated Adaptive Hyperplasia (DAH) Tumorigenesis Model to Estimate Low-Dose Dibenzo[a,l]pyrene Tumor Risk
Kenneth T. Bogen, <i>Exponent, Oakland, CA</i> |

A Partial List Of Poster Presentations

Origin of the Linearity-No Threshold (LNT) Dose Response Concept

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

Low Dose Radiation Therapy (LD-RT) is Effective in the Treatment of Arthritis: Animal Model Findings

Edward J. Calabrese, *University of Massachusetts, Amherst, MA*
 Vittorio Calabrese, *University of Catania, Catania, Italy*

The Historical Use of Radiotherapy in the Treatment of Sinus Infections

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

Application of Radiation Hormesis to Resolve Metastatic Disease in Late-Stage Cancer Patients

Mohan Doss, *Fox Chase Cancer Center, Philadelphia, PA*

Towards a Mechanistic Understanding of Hormetic Responses and their Regulation in Arabidopsis

Thomas Eulgem, Melinda-Rodriguez-Salus, Yasemin Bektas, Trang Vu, *University of California at Riverside, Riverside, CA*

A role for Annexin II and Ca²⁺ Signalling in Human Epithelial Cells by Low Doses of X-ray Radiation in a Radiation-Induced Bystander Effect

Hayley Furlong, *Dublin Institute of Technology, Dublin, Ireland*
 Richard Smith, *McMaster University, Hamilton, ON, Canada*
 Jiayi Wang, *Queen's University, Kingston, ON, Canada*
 Colin Seymour, Carmel Mothersill, *McMaster University, Hamilton, ON, Canada*
 Orla Howe, *Dublin Institute of Technology, Dublin, Ireland*

Association of Hypertension Mortality Rates with Concentrations of Chiropractors and Medical Doctors in the U.S., 2007-2009

John F. Hart, *Sherman College of Chiropractic, Department of Research, Spartanburg, SC*

EPA's Stage 2 Disinfection Byproducts Rules: Scientific Efficacy and Economic Impact for Northern Kentucky

Hugh Henry, *Northern Kentucky University, Nunn Drive, Highland Heights, KY*

Antibiotic-induced Biofilm Formation

Jeffrey Kaplan, *American University, Washington DC*

Astrocyte Plasticity Revealed by Adaptations to Severe Proteotoxic Stress

Rehana Leak, Amanda M. Titler, Jessica M. Posimo, *Duquesne University, Pittsburgh, PA*

Emission of Ultraviolet Radiation from Human Keratinocytes is a Potential Bystander Stress Mechanism

Michelle Le, Carmel Mothersill, Fiona McNeill, Colin Seymour, *McMaster University, Hamilton, ON, Canada*

Dose Not Exposure Concentration Makes the Poison – Aquatic Toxicity Under Changing Water Concentrations

David Page, *Bowdoin College Chemistry Department, Brunswick, ME,*
 Peter Landrum, *Ann Arbor MI,*
 Peter Chapman, *Golder Associates Ltd., Burnaby, BC, Canada,*
 Jerry Neff, *Neff & Associates LLC, Duxbury, MA*

Crosstalk between Bystander and Directly Irradiated Cells: Evidence for Bystander Cell Conditioned Medium (BCCM) Mediating a Response in Human Keratinocytes HaCaT Cultures

Christine Pinho, *McMaster University, Hamilton, ON, Canada,*
 Raimond Wong, Joseph E. Hayward, *Juravinski Cancer Centre, Hamilton, ON, Canada,*
 Colin Seymour, Carmel Mothersill, *McMaster University, Hamilton, ON, Canada*

Hormetic Reaction Pattern of Microglia

Caroline Schmidt, Nadine Schneble, Jörg P. Müller, Reinhard Wetzker, *University Hospital Jena, Jena, Germany*

Regulation of Autophagy by AMPK in Endothelial Cells

Katrin Spengler, Regine Heller, *Jena University Hospital, Jena, Germany*

Physiology From the Perspective of Control: Why Expect Hormesis: How to Integrate Diverse Exposures

David R. Whitlock, *NitroCell Biosciences, LLC, Needham, MA*

The International Dose-Response Society is proud to announce the recipients of the annual awards for **Outstanding Career Achievement** and **Outstanding Leadership**. These awards are presented to individuals in each category who have made outstanding contributions to the field of Dose-Response.

This years awards to go: **Reinhard Wetzker** for Outstanding Career Achievement and **A. Wallace Hayes** for Outstanding Leadership. Congratulations to all.

2013 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

AWARDEE PROFILE: CAREER ACHIEVEMENT



REINHARD WETZKER

Ph.D. Biochemistry, Cell Biology,

Education: Diploma Biochemistry, University Halle, Germany, 1975; Ph.D. Biochemistry, University Moscow, 1978.

Current Position: Head of the Institute of Molecular Cell Biology, Center for Molecular Biomedicine, University Hospital, Jena, Germany.

Research Areas: Molecular Cell Biology, Signaling Research, Inflammatory Stress Responses.

Professional Employment: Postdoctoral researcher, Institute of Biochemistry, University Hospital Jena, 1978-1992; Postdoctoral fellowship, Ludwig Institute for Cancer Research, London, 1989-1990; Group leader Max Planck Society, Research Unit "Molecular Cell Biology", 1992-1997; C3 Professorship for "Medical Molecular Biology", University Hospital Jena, 1994-2004; W3 Professorship University Hospital Jena, since 2005.

Professional Affiliations: Speaker of the Collaborative Research Center SFB 197 "Bio-und Modellmembranen" in Jena, 1996-2001; Coordinator of the European Union founded collaborative project (FP 6) "Alleviation of chronic inflammatory diseases", 2001-2005; Member of the Managing Board of the "Jena Centre for Bioinformatics", since 2001; Speaker of the Collaborative Research Center SFB 604 "Multifunctional Signaling Proteins", 2002-2009; Speaker of the Research Training Group 1715 "Molecular Signatures of Adaptive Stress Responses", since 2012.

2013 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

AWARDEE PROFILE: LEADERSHIP



DR. A. WALLACE HAYES

Dr. Hayes is a toxicologist with over 35 years of experience in industry and academics. He holds degrees from Auburn University (Ph.D. and M.S.) and Emory University (A.B.). Dr. Hayes was a NSF predoctoral fellow at Auburn University, a NIH individual postdoctoral fellow at the Vanderbilt University School of Medicine, a NATO Senior Scientist at the Central Veterinary Laboratory in Weybridge, England and held a NIH Research Career Development Award. Dr. Hayes has held tenured Professorships at the University of Alabama, the University of Mississippi Medical Center and Wake Forest University School of Medicine. Dr. Hayes has served on committees and expert panels for the

National Academy of Sciences, the National Institutes of Health, the Environmental Protection Agency and the Department of Defense. Dr. Hayes has served on a number of GRAS Expert Panels. Dr. Hayes has authored more than 225 peer reviewed publications, is the editor of Principles and Methods of Toxicology, Human and Experimental Toxicology, Cutaneous and Ocular Toxicology and co-editor of the Target Organ Toxicity Series. Dr. Hayes is the Editor-in-Chief, Food and Chemical Toxicology. Dr. Hayes is a past Secretary-General of IUTOX (two terms), past treasurer and board member of the American Board of Toxicology, a past president of the American College of Toxicology, the Toxicology Education Foundation, and the Academy of Toxicological Sciences and a past member of the council of the Society of Toxicology. Dr. Hayes is a diplomate of the American Board of Toxicology, the Academy of Toxicological Sciences, the American Board of Forensic Medicine, and the American Board of Forensic Examiners. He is a Fellow of the Academy of Toxicological Sciences, the Institute of Biology (UK), the American College of Forensic Examiners and the American College of Nutrition. Dr. Hayes is a registered toxicologist in the European Union (ERT) and a certified nutrition specialist (food safety). Dr. Hayes was honored by the Society of Toxicology in 2006 with the Society's Merit Award, by the Mid-Atlantic Society of Toxicology with its Ambassador Award in 2012, and by the American College of Toxicology in 2012 with its Distinguished Scientist Award.

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 2014: 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

ANNOUNCEMENT

The 13th International Conference on
**DOSE-RESPONSE 2013: IMPLICATIONS FOR
TOXICOLOGY, MEDICINE, AND RISK ASSESSMENT**
The Annual Meeting of the International Dose-Response Society

APRIL 22-23, 2014

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

DEADLINE FOR SUBMISSION

December 13, 2013

E-mail to dleonard@schoolph.umass.edu

INTERNATIONAL DOSE-RESPONSE SOCIETY

2013 Membership Form for New and Renewing Members

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

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

Organization: _____

Department: _____

Street/PO Box: _____

City: _____ State: _____

Country: _____ Postal Code: _____

Telephone: _____ / _____ / _____
Country code Area code Number

Fax: _____ / _____ / _____
Country code Area code Number

Email Address: _____

Completed application form along with a check or money order in US dollars should be mailed 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 Email: Sorensen@ehs.umass.edu

Signature of Applicant

Date