

The 10th Annual International Conference on

DOSE-RESPONSE 2011:

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

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

April 26-27, 2011

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**

Morning 8:30am-Noon

Session I: CLINICAL/THERAPEUTIC – PART 1 164 Campus Center

Moderator: George A Perdrizet, *Kent Hospital, Warwick, RI*

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| <p>8:30am Mechanisms and Examples of Biphasic Dose Response in Low-Level Light Therapy
Ying-Ying Huang, <i>Wellman Center for Photomedicine, Massachusetts General Hospital, Boston MA, Aesthetic Plastic Laser Center, Guangxi Medical University, Nanning, Guangxi, P. R China</i>
Sulbha K Sharma and Gitika B Kharkwal, <i>Wellman Center for Photomedicine, Massachusetts General Hospital, Boston MA, Department of Dermatology, Harvard Medical School, Boston MA</i>
Luis De Taboada and Thomas McCarthy, <i>PhotoThera Inc, Carlsbad, CA</i>
Michael R Hamblin, <i>Wellman Center for Photomedicine, Massachusetts General Hospital, Boston MA, Department of Dermatology, Harvard Medical School, Boston MA, Harvard-MIT Division of Health Sciences and Technology, Cambridge MA</i></p> | <p>9:00am Hormesis-based Anti-aging Products: a Case Study of a New Cosmetic
Suresh Rattan, <i>University of Aarhus, Denmark</i></p> <p>9:30am Therapeutic Implications of Hormesis
Wayne Jonas, <i>Samueli Institute, Alexandria VA</i></p> <p>10:00am Break</p> <p>10:30am The Sandpile Model: Optimal Stress, Complexity, and Hormesis
Martha Stark, MD, <i>Harvard Medical School, Newton MA</i></p> |
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Session II: PLENARY 164 Campus Center

Moderator: Edward Calabrese, *University of Massachusetts Amherst, Amherst, MA*

- 11:00am **Central Role of the Brain in Stress and Adaptation: Allostasis and Allostatic Load**
Bruce McEwen, *The Rockefeller University, New York, NY*
- Noon **Lunch**

Afternoon 1:00pm - 5:30pm

Session III: CLINICAL/THERAPEUTIC – PART 2 164 Campus Center

Moderator: Edward Calabrese, *University of Massachusetts Amherst, Amherst, MA*

- 1:00pm **Surgical Stress and the Heat Shock Response: Models of Stress Conditioning**
George A Perdrizet, *Wound Care and Hyperbaric Medicine, Kent Hospital, Warwick, RI*
Lawrence Hightower, Cassandra Godman and Charles Giardina, *University of Connecticut, Storrs, CT*

Session IV: ENVIRONMENTAL 164 Campus Center

Moderator: George Hoffmann, *College of the Holy Cross, Worcester, MA*

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| <p>1:30pm Hormetic Responses of the Aquatic Invertebrate <i>Daphnia magna</i> to Exposure to Energetic Compounds
Jacob K. Stanley, Edward J. Perkins, Jerre G. Sims, Pomsawan Chappell, Anthony J. Bednar and Amber L. Russell, <i>U.S. Army Engineer Research and Development Center, Vicksburg, MS</i></p> <p>2:00pm Xenohormetic, Hormetic, and Cytostatic Selective Forces Drive the Evolution of Longevity Regulation Mechanisms within Ecosystems
Vladimir Titorenko, Michelle T. Burstein, Adam Beach, Vincent R. Richard, Olivia Koupaki and Anastasia Glebov, <i>Concordia University, Montreal, Quebec, Canada</i></p> <p>2:30pm Issues in the Interpretation of Low Dose Effects in Radiobiology and Environmental Radiation Protection
Carmel Mothersill and Colin Seymour, <i>McMaster University, Hamilton, Ontario, Canada</i></p> | <p>3:00pm Bystander Effects and Adaptive Responses Modulate the Biological Responses to Low Dose Ionizing Radiation
Edouard I. Azzam, <i>UMDNJ-New Jersey Medical School Cancer Center, Newark, NJ</i></p> <p>3:30pm Break</p> <p>4:00pm Debunking the Myth of Increased Cancer Incidence Attributed to Medical Radiation
Mohan Doss, <i>Fox Chase Cancer Center, Philadelphia, PA</i></p> <p>4:30pm Human Health and the Biological Effects of Low Dose Tritium in Drinking Water
Doug Boreham, Steve Dingwall, Caitlin Mills, Nghi Phan and Kristina Taylor, <i>McMaster University, Hamilton, Ontario, Canada</i></p> <p>5:00pm Public Policy and Hormesis
Colin Seymour, <i>McMaster University, Hamilton, Ontario, Canada</i></p> |
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Morning 8:00am-Noon

Session I: BIOMEDICAL 164 Campus Center

Moderator: Wayne Jonas, *Samueli Institute, Alexandria, VA*

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| <p>8:00am Hormesis Challenges Pharmaceutical Industry Research and Development: Solutions from a Regulatory Perspective
Kenneth I. Maynard, <i>MSc, PhD, FAHA, Sanofi-aventis, US, Inc, Bridgewater, NJ</i></p> <p>8:45am Communicating Health Research to the Public: The Challenge of Promoting Health in a U-Shaped World
David J. Waters, <i>DVM, PhD, Purdue University, West Lafayette, IN</i></p> <p>9:30am Dietary Restriction, Acute Stress Resistance and Hormesis
James Mitchell, <i>Harvard School of Public Health, Boston, MA</i></p> <p>10:00am Break</p> | <p>10:30am Hormesis-Based Development of Botanical Insect Antifeedants as Therapeutic Agents
Mark Mattson, <i>National Institute on Aging Intramural Research Program, Baltimore, MD</i></p> <p>11:00am Oxidative Damage: is Damage the Correct Term?
Radak Zsolt, <i>Semmelweis University, Budapest, Hungary</i></p> <p>11:30am Molecular Signatures of Adaptive Stress Responses: Studying Molecular Mechanisms of Adaptation
Ignacio Rubio, <i>Friedrich-Schiller-University Jena, Jena, Germany</i></p> <p>Noon Lunch</p> |
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Afternoon 1:00pm - 3:00pm

Session III: BIOMEDICAL, continued 164 Campus Center

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| <p>1:00pm Understanding the Beneficial Effects of Pharmacological SIRT1 Activation
Nathan L. Price, <i>Harvard Medical School, Boston, MA</i>
Ana P. Gomes, <i>Center for Neurosciences and Cell Biology, Coimbra, Portugal</i>
Alvin Ling, <i>Harvard Medical School, Boston, MA</i>
Anabela P. Rolo and Carlos M. Palmeira, <i>Center for Neurosciences and Cell Biology, Coimbra, Portugal</i>
Rafael de Cabo, <i>National Institutes of Health, Baltimore, MD</i>
Joseph Baur, <i>University of Pennsylvania School of Medicine, Philadelphia, PA</i>
David Sinclair, <i>Harvard Medical School, Boston, MA</i></p> <p>1:30pm Biphasic Dose Response in a Model of Tauopathy Utilizing Cyanine Dyes
Erin Congdon and K. Duff, <i>Columbia University and Department of Integrative Neuroscience New York State Psychiatric Institute, New York, NY</i>
J. Kuret, <i>Ohio State University, Columbus, OH</i></p> | <p>2:00pm Early Environmental Changes Influence Long-term Vascular Function in Mice
Eric Thorin, Virginie Bolduc, Albert Nguyen and François Leblond, <i>Université de Montréal, Montréal, Québec, Canada</i></p> <p>2:30pm Simulation Studies to Complement Observational Data: What can we learn? How should they be used?
Edward J. Stanek III and Edward J. Calabrese, <i>University of Massachusetts, Amherst, MA</i></p> |
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TUESDAY EVENING

POSTER SESSION & SOCIAL

5:30pm – 6:30pm • Amherst Room, 10th Floor Campus Center

DINNER

6:30pm

Gene Expression Profiles of Hormetic Effects in *Drosophila Melanogaster*

Michael Antosh and Stephen Helfand, *Brown University, Providence RI*
 Johannes Bauer, *Southern Methodist University, Dallas TX*
 Nicola Neretti and Leon Cooper, *Brown University, Providence RI*

Hormesis Demonstrated for Mutagenicity

Edward J. Calabrese and Edward J. Stanek III, *University of Massachusetts, Amherst, MA*
 Marc A. Nascarella, *Gradient, Cambridge, MA*

Cancer Mortality for a Single Race in Low versus High Land Elevation in the U.S.

John Hart, *Sherman College of Chiropractic, Spartanburg, SC*

Lack of Association between Lung Cancer, Smoking, and Radon in Oregon

John Hart, *Sherman College of Chiropractic, Spartanburg, SC*

Mechanisms underlying Genotoxic Thresholds in the Low Dose Region

Gareth JS Jenkins, *Swansea University, Singleton Park, Swansea UK*

Human Lung Cancer Risks from Radon – Part I – Influence from Bystander Effects – A Microdose Analysis

Bobby E. Leonard, *International Academy of Hi-Tech Services, Inc.*
 Richard E. Thompson, *Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins Medical Center*
 Georgia C. Beeche, *International Academy of Hi-Tech Services, Inc.*

Human Lung Cancer Risks from Radon – Part II – Influence from Combined Adaptive Response and Bystander Effects – A Microdose Analysis

Bobby E. Leonard, *International Academy of Hi-Tech Services, Inc.*
 Richard E. Thompson, *Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins Medical Center*
 Georgia C. Beeche, *International Academy of Hi-Tech Services, Inc.*

Human Lung Cancer Risks from Radon – Part III – Evidence of Influence of Combined Bystander and Adaptive Response Effects on Radon Case-Control Studies – A Microdose Analysis

Bobby E. Leonard, *International Academy of Hi-Tech Services, Inc.*
 Richard E. Thompson, *Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins Medical Center*
 Georgia C. Beeche, *International Academy of Hi-Tech Services, Inc.*

Case Study: Quantitative Assessment of the Biphasic Dose-response of PolyN-isopropylacrylamide (PNIPAM) Nanoparticles

Marc A. Nascarella, *Gradient, Cambridge, MA*
 Edward J. Calabrese, Ph.D., *University of Massachusetts, Amherst, MA*

Hormesis: Présentation of a Practical Application of Hormesis Laws in Individualized Preventive Medicine

Marc Peignier, *Centre de santé la Corbière, Switzerland, and MediPrevent, Association*

Computed Tomography Scans Modify Biological Consequences of Prior High Dose Radiation Exposures in Trp53 Heterozygous Mice

N Phan, ME Cybulski, L Laframboise, N McFarlane and DR Boreham, *McMaster University, Hamilton, ON, Canada*

Biological Effects of PET Imaging Procedures

Kristina Taylor, Nghi Phan and Douglas R. Boreham, *McMaster University, Hamilton, ON, Canada*

Why Hormesis is the Most Fundamental Dose Response

David R. Whitlock, *Nitroceutic LLC, Dover, MA*

2011 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

OVERVIEW

*The International Dose-Response Society is proud to announce the recipients of the annual awards for **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, **Jerry Milton Cuttler** DSc, PEng, for Outstanding Career Achievement and **Marc A. Nascarella**, Ph.D. for Outstanding New Investigator. Congratulations to all.*

2011 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

AWARDEE PROFILE: CAREER ACHIEVEMENT

Jerry Milton Cuttler, DSc, PEng



Dr. Cuttler received his BSc-Eng degree (1964) in engineering physics from the University of Toronto and his MSc and DSc degrees (1967-1971) in nuclear sciences and engineering from the Israel Institute of Technology. Until 1974, he managed a radiation detector company.

At Atomic Energy of Canada Limited, he led the design and procurement of the reactor control, safety systems and radiation monitoring instrumentation for the first CANDU-6 reactors, the four-reactor Pickering-B station and the four-reactor Bruce-B station. He was engineering manager of AECL's Bruce-B Project, resident engineering manager in Romania, engineering manager district heating reactors, manager of services to the eight-reactor Pickering station, engineering integration manager of the CANDU-9 Project and manager of technical services including Y2K support to 28 reactors.

Dr. Cuttler has been an active member of Professional Engineers Ontario, Canadian Nuclear Society (president 1995-1996), American Nuclear Society, American Physical Society, Canadian Nuclear Association, Health Physics Society, Canadian Radiation Protection Association and the International Dose-Response Society. He has written hundreds of technical reports for nuclear stations, tens of conferences papers and articles for peer-reviewed journals.

Starting in 2000, he provided services to Ontario Power Generation for returning Pickering Unit-4 to service and extending the life of the Pickering-B station, to AECL for completing reactors to supply radioisotopes for diagnostic scanning, to Bruce Power for restarting reactors 1/2 and extending the Bruce-B reactor lives for 30 years.

Since 1995, Dr. Cuttler has been assessing the health effects of ionizing radiation and drawing international attention to radiation hormesis. He presented tens of papers at many conferences pointing out that low exposures are stimulating for curing infections, extending life and reducing the incidences of cancer and congenital malformations. He organized adaptive response sessions at nuclear energy conferences, inviting renowned radiobiologists to present remarkable evidence. He has urged many oncologists to use total-body low-dose radiation in cancer therapy. He has intervened with regulators with submissions that identify beneficial effects following low doses and debunk the LNT assumption. He arranged presentations by world specialists in low dose at hospitals, universities, nuclear centers and societies. He continues to communicate positive low dose information and fight politicized radiation scares on the Internet and at professional and social clubs.



Marc A. Nascarella, Ph.D.

Dr. Marc A. Nascarella is a toxicologist at Gradient (Cambridge, MA) and specializes in comprehensive chemical evaluations for use in human health risk assessments, product safety evaluations, and litigation support. He is also active in Gradient's Nanotoxicology Practice where he writes quarterly articles for various trade publications, and has recently served as a Guest Editor of a Dose-Response special issue on nanomaterials. Dr. Nascarella has previously served in a number of academic research centers, professional scientific organizations, government agencies, and the active-duty military.

Dr. Nascarella holds an academic appointment as an Adjunct Assistant Professor at the University of Massachusetts Amherst, where he has lectured on environmental health topics, and collaborates with an interdisciplinary dose-response research group. His current research is focused on evaluating high-throughput screening assays to better characterize response in the low-dose zone. These investigations have included evaluations of pharmaceuticals (e.g., antineoplastic and antimicrobial agents), suspected chemical mutagens, and nanomaterials. Dr. Nascarella is an author on over 65 scientific publications and presentations, dealing mostly with quantitative dose-response assessment. Recently, he presented a methodology to evaluate biphasic dose-responses at a National Academy of Sciences risk assessment symposium. Dr. Nascarella's research has been recognized with awards from the Society of Toxicology's Risk Assessment Specialty Section, the Colgate-Palmolive/Society of Toxicology Awards Committee, the Entomological Society of America, and the Society for Risk Analysis' Dose-Response Specialty Group.

Dr. Nascarella earned a B.S. (cum laude) from Norwich University where he currently serves on the Board of Fellows for the School of Mathematics and Science. He also earned an M.S. and Ph.D. in the Department of Public Health's toxicology program at the University of Massachusetts Amherst (Advisor Dr. E.J. Calabrese), and has post-graduate training in immunotoxicology at Texas Tech University/Health Sciences Center (Advisor Dr. S.M. Presley).

Dr. Nascarella is a member of the International Dose-Response Society, Sigma Xi, Society for Risk Analysis, Society of Toxicology, and the American Association for the Advancement of Science.

ANNOUNCEMENT

The 11th International Conference on
**DOSE-RESPONSE 2012: IMPLICATIONS FOR
TOXICOLOGY, MEDICINE, AND RISK ASSESSMENT**
The Annual Meeting of the International Dose-Response Society
APRIL 24-25, 2012

University of Massachusetts at Amherst

- *Adaptive* • *Bidirectional* • *Biphasic* • *Hormetic* • *Non-Monotonic* • *Yerkes-Dodson Law (Psychology)*
- *U-Shaped* • *J-Shaped* • *Subsidiy-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 15, 2011

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 2010: 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

2011 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