

The 16th Annual International Conference on Dose-Response

PRECONDITIONING
IN BIOLOGY
AND MEDICINE

Mechanisms and
Translational Research

The Annual Meeting of the
International **DOSE-RESPONSE** Society
www.Dose-Response.org

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

April 18-19, 2017
University of Massachusetts
Amherst, MA

Threshold
Adaptive
Bidirectional
Biphasic
Hormetic
Non-Monotonic
U/J Shaped
Linear



*Approved for CPH Recertification by the
National Board of Public Health Examiners*

PLATFORM PRESENTATIONS

TUESDAY, APRIL 18, 2017

Welcome 8:15am

PLENARY SESSION

Moderator: **James Giordano**, Georgetown University, Washington, DC

8:30am Hormetins as Drugs for Healthy Aging

Suresh Rattan, Laboratory of Cellular Ageing, Department of Molecular Biology and Genetics, Aarhus University, Denmark

9:15am H2S-Based Anti-inflammatory Drugs: Lost and Found in Translation

John Wallace, University of Calgary, Calgary, Alberta, Canada & Antibe Therapeutics, Toronto, Ontario, Canada

10:00am Break

Session I: PRECONDITIONING IN CARDIOLOGY APPLICATIONS

Moderator: **James Mitchel**, Harvard Medical School, Cambridge, MA

10:30am Remote Ischemic Preconditioning: From Bench to Bedside

Robert A. Kloner, MD, PhD, Huntington Medical Research Institutes, Pasadena, CA, Pasadena, CA and Keck School of Medicine at the University of Southern California, Los Angeles, CA

11:15am Ethanol Ingestion Elicits an Anti-inflammatory Phenotype to Limit Ischemia/Reperfusion Injury by a Neutrophil-dependent Mechanism

Ronald J. Korthuis, Department of Medical Pharmacology and Physiology and the Dalton Cardiovascular Research Center, University of Missouri School of Medicine, Columbia, MO

LUNCH Noon • Amherst Room, 10th Floor Campus Center

Session I: PRECONDITIONING IN CARDIOLOGY APPLICATIONS, Part 2

Moderator: **James Mitchel**, Harvard Medical School, Cambridge, MA

1:00pm Ischaemic Preconditioning To Enhance Sport Performance: Waste of Time or No Time to Waste?

Dick H.J. Thijssen, Research Institute for Sport and Exercise Science, Liverpool John Moores University (UK) and Department of Physiology, Radboud University Medical Centre (The Netherlands)

1:30pm Glutamate Dehydrogenase Is the Source of Signaling ROS Activating Cardioprotective Signaling Pathways During Ischemic Pre-Conditioning

James N. Weiss, MD, Guillaume Calmettes, PhD, Scott John, PhD, and Paavo Korge, PhD., Division of Cardiology, David Geffen School of Medicine at UCLA, Los Angeles, CA

Session II: PRECONDITIONING IN NEUROLOGICAL APPLICATIONS

Moderator: **James Giordano**, Georgetown University, Washington, DC

2:00pm Adaptive Preconditioning in Neurological Diseases – Therapeutic Insights from Proteostatic Perturbations

Bertrand Mollereau, Laboratory of Biology and Modelling of the Cell, Ecole Normale Supérieure de Lyon, France

2:30pm Ischemic Preconditioning: Mechanisms of Neuroprotection

Miguel A. Perez-Pinzon, PhD, FAHA Cerebral Vascular Disease Research Laboratories, University of Miami Miller School of Medicine, Miami, FL

3:00pm Break

3:30pm Dose-Dependent Neurocognitive Effects of Transcranial Infrared Laser Stimulation

Francisco Gonzalez-Lima, University of Texas at Austin, Departments of Psychology, Pharmacology and Toxicology, Austin, TX

4:00pm Diet-Induced Metabolic Preconditioning of Brain Function and Plasticity through Epigenetics

Fernando Gomez-Pinilla, Depts. Integrative Biology & Physiology and Neurosurgery, UCLA Medical School, Los Angeles, CA

4:30pm Exercise is Beneficial in Models of Retinal Disease

Jeffrey H. Boatright, PhD, The Center for Visual and Neurocognitive Rehabilitation, Atlanta VA Medical Center and the Department of Ophthalmology, Emory University School of Medicine, Atlanta, GA

Vincent T. Ciavatta, PhD, Micah A. Chrenek, Priscila P. Cunha, Sarah W. Gooding, Nathaniel F. Henneman, John M. Nickerson, PhD, Jana T. Sellers, Robin H. Schmidt, PhD, The Center for Visual and Neurocognitive Rehabilitation, Atlanta VA Medical Center and the Department of Ophthalmology, Emory University School of Medicine, Atlanta, GA

Machelle T. Pardue, PhD, The Center for Visual and Neurocognitive Rehabilitation, Atlanta VA Medical Center and the Coulter Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA

Rachael S. Allen, PhD, M.H. Aung, MD, PhD, R. Chakraborty, PhD, M.A. Gogniat, Adam Hanif, Eric C. Lawson, Brian C. Prall, Megan Prunty, The Center for Visual and Neurocognitive Rehabilitation, Atlanta VA Medical Center and the Coulter Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA

Joe R Nocera, PhD, The Center for Visual and Neurocognitive Rehabilitation, Atlanta VA Medical Center and the Department of Neurology, Emory University, Atlanta, GA

TUESDAY EVENING POSTER SESSION & SOCIAL 5:00pm – 6:30pm

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

PLATFORM PRESENTATIONS (cont.)

WEDNESDAY, APRIL 19, 2017

Session III - GENERAL BIOMEDICAL IMPLICATIONS OF PRECONDITIONING

Moderator: **Barry Braun**, *Colorado State University, Fort Collins, CO*

8:30am Old Dog, New Tricks—Role of Hydrogen Sulfide and NAD⁺ in Angiogenesis and Health

Abhirup Das, *Alban Longchamp, James R. Mitchell, and David A. Sinclair*, *Harvard School of Public Health, Harvard Medical School and University of New South Wales*

9:00am Does Energetic Stress Activate Mechanisms of Proteostatic Maintenance and Slowed Aging?

Karyn L. Hamilton, *Colorado State University, Health and Exercise Science, Fort Collins, CO*

Joshua C. Drake, *University of Virginia School of Medicine, Charlottesville, VA*

Danielle R. Bruns, *University of Colorado Denver, Denver, CO, Aurora, CO*

Frederick F. Peelor, *Colorado State University, Health and Exercise Science, Fort Collins, CO*

Sarah E. Ehrlicher, *Oregon State University, College of Public Health and Human Sciences, Corvallis, OR*

Benjamin F. Miller, *Colorado State University, Health and Exercise Science, Fort Collins, CO*

9:30am Carbon Monoxide-Releasing Molecules (CORMs) as Novel Anti-Obesity Drugs

David E. Stec, *Department of Physiology & Biophysics, University of Mississippi Medical Center, Jackson, MS*

10:00am Break

10:30am Stem Cells-Based Therapy For Ischemic Stroke

Kunlin Jin, *M.D., Ph.D., Professor, University of North Texas Health Science Center at Fort Worth, Texas, USA*

11:00am Advancing Environmental Enrichment as a Pre-Clinical Model of Neurorehabilitation

Anthony Kline, *PhD, and Corina O. Bondi*, *University of Pittsburgh, Departments of Physical Medicine & Rehabilitation, Critical Care Medicine, and Psychology. Safar Center for Resuscitation Research, Pittsburgh, PA*

11:30am The Repeated Bout Effect in Exercise

Ken Kazunori Nosaka, *PhD, Edith Cowan University, School of Medical and Health Sciences, Joondalup, Western Australia*

LUNCH Noon • Amherst Room, 10th Floor Campus Center

Session IV - ENVIRONMENTAL IMPLICATIONS OF PRECONDITIONING

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

1:30pm The Role of Excitation Events in Low Dose Radiobiology

Carmel Mothersill, Colin Seymour, *Department of Medical Physics and Applied Radiation Sciences, McMaster University, Hamilton, Ontario, Canada*

2:00pm Is Ionizing Radiation Harmful at any Exposure?

Edouard Azzam, *Rutgers New Jersey Medical School, Newark, NJ*

2:30pm Low-Dose Dose-Response for In Vitro Nrf2-ARE Activation in Human Liver HepG2 Cells

Kenneth Bogen, *Exponent Health Sciences, Oakland, CA*

3:00pm CONFERENCE IN PERSPECTIVE

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

Gene Expression as a Radiation Dosimeter in *Drosophila melanogaster*

Michael P. Antosh and Samana Shrestha, *University of Rhode Island, Physics Department, University of Rhode Island, Kingston, RI*
 Adam Vanasse, *University of Rhode Island, Kingston, RI*
 Leon N Cooper, *Brown University, Department of Physics and Institute for Brain and Neural Systems, Providence, RI*

Impact of Chronic Low-dose Tritium Radiation Exposure on Lung Carcinogenesis in Laboratory Mice

Laura Bannister and Mandy Serran, *Canada Nuclear Laboratories, Chalk River, ON, Canada*

The Importance of Hormesis and the Effects of UVA Irradiation on *Drosophila melanogaster* Performance

Raymond Berry III and Dr. Giancarlo Lopez-Martinez, *New Mexico State University, Biology, Las Cruces, NM*

Evidence that Lifelong Low Dose-Rates of Ionizing Radiation Increase Lifespan in Long- and Short-Lived Dogs

Jerry M. Cuttler, *Cuttler & Associates Inc, Vaughan, ON, Canada*
 Ludwig E. Feinendegen, *Heinrich-Heine-University Düsseldorf, Germany, and Brookhaven National Laboratory, Upton, NY*
 Yehoshua Socol, *Falcon Analytics, Karney Shomron, Israel*

Treatment of Alzheimer Disease with CT Scans: Update on a Case Report

Jerry M. Cuttler, *Cuttler & Associates Inc., Vaughan, ON, Canada*
 Eugene R. Moore, *Dow Chemical Company, Midland, MI*
 Victor D. Hosfeld, *MidMichigan Health, Midland, MI*
 David L. Nadolski, *Midland Internal Medicine Associates PC, Midland, MI*

Anoxia Preconditioning as a Hormetic Treatment in *Tenebrio molitor*

Alyssa De La Torre and Dr. Giancarlo Lopez-Martinez, *New Mexico State University, Biology, Las Cruces, NM*

Radiotherapy for Pertussis: An Historical Assessment

Gaurav Dhawan and Edward J. Calabrese PhD, *Environmental Health Sciences, University of Massachusetts, Amherst, MA*
 Rachna Kapoor MD, *Saint Barnabas Medical Center, Livingston, NJ*

Metabolic Syndromes Among Diabetic Pre-And Postmenopausal Women.

Kawaljit Kaur, *Panjab University, Punjab, India*

Irradiation Hormesis Shows Activity Improvement in a *Drosophila melanogaster* Parkinson's Disease Model

Giancarlo Lopez-Martinez and Zachary Clifford, *Department of Biology, New Mexico State University, Las Cruces, NM*

Low-dose Radiation Exposure in Early Life Stimulates Reproductive Performance in a Short-lived Model of Aging

Alexander Shephard, Vadim Aksenov, and Jonathan Tran, *McMaster University, Biology, Hamilton, ON, Canada*
 C. David Rollo, *McMaster University, Biology, Hamilton, ON, Canada*

In-Utero Low Dose Irradiation Effects on Post-Natal Growth and Blood Pressure in C57Bl Mice

Shayen Sreetharan, *McMaster University, Department of Biology, Hamilton, Ontario, Canada*
 Lisa Stoa, *McMaster University, Department of Medical Physics and Applied Radiation Sciences, Hamilton, Ontario, Canada*
 Mary Ellen Cybulski, *Northern Ontario School of Medicine, Laurentian University, Division of Medical Sciences, Sudbury, Ontario, Canada*
 Adomas V. Kulesza, *McMaster University, Department of Biology, Hamilton, Ontario, Canada*
 Douglas R. Boreham, *Northern Ontario School of Medicine, Laurentian University, Division of Medical Sciences, Sudbury, Ontario, Canada*
 T. C. Tai, *Northern Ontario School of Medicine, Laurentian University, Division of Medical Sciences, Sudbury, Ontario, Canada*
 Joanna Y. Wilson, *McMaster University, Department of Biology, Hamilton, Ontario, Canada*

Acute Low Dose Ionizing Radiation Stimulates the Innate Immune System of the Cricket (*Acheta domestica*): Evidence for Hormesis

Jonathan Tran, Vadim Aksenov, Alexander Shepard, and C. David Rollo, *McMaster University, Biology, Hamilton, ON, Canada*

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.

International **DOSE-RESPONSE** Society
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. Members will receive a 25% reduction in registration fees to Dose-Response 2017: 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**

2017 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, Outstanding Leadership** and **Outstanding New Investigator**. These Awards are presented to individuals in each category who have made outstanding contributions to the field of Dose-Response.*

*This year's awards go to **Suresh Rattan** for Outstanding Career Achievement, **Walter J. Kozumbo** for Outstanding Leadership, and **Christopher Thome** for Outstanding New Investigator. Congratulations to All!*

AWARDEE PROFILE: CAREER ACHIEVEMENT



SURESH RATTAN

Suresh Rattan, Ph.D., D.Sc. heads the Laboratory of Cellular Ageing, at the Department of Molecular Biology and Genetics, Aarhus University, Denmark. He is the recipient of the Lord Cohen Medal in Gerontology from the British Society for Research on Ageing, an Honorary Doctorate from the Russian Academy of Medical Sciences, and is the present Chairman of the Biological Section of the European Region of the International Association of Gerontology and Geriatrics (IAGG-ER). He is one of the pioneers in testing, developing and applying the concept of hormesis for the modulation of ageing and longevity in cultured human cells. He has published more than 250 scientific articles, and has compiled 15 books, including books for children, general-public, and research scientists.

He is the founder and Editor-in-Chief of Biogerontology – an international peer reviewed journal published by Springer. His personal website is: <http://www.sureshrattan.com>

2017 INTERNATIONAL DOSE-RESPONSE SOCIETY AWARDS

AWARDEE PROFILE: LEADERSHIP



WALTER J. KOZUMBO

Walter J. Kozumbo, Ph.D., After graduating from Princeton University (AB, 1967), Walt taught science and coached sports for nearly a decade at the Gilman School, Baltimore, MD. During this time, he earned a Master's degree in biology from Purdue University (MS, 1972) and another in Liberal Arts (MLA, 1976) from Johns Hopkins University. Excited by science, he left teaching and earned a PhD in biochemical toxicology at Johns Hopkins in 1983. His graduate experience helped him secure a post-doctoral fellowship at the Swiss Cancer Research Institute, Lausanne, Switzerland, where he investigated oxy-radical involvement in chemical carcinogenesis and the molecular signaling pathways mediating immune-cell activation. In 1986, Walt left Switzerland

for a position at the University of North Carolina School of Medicine. There he collaborated with EPA scientists for five years on an important human lung-cell study that ultimately established the National Ambient Air Quality Standards for ozone. In 1991, the EPA Office of Pesticide Programs hired Walt to review toxicology studies that were used to establish safe pesticide-exposure levels for humans. Within a year, the Air Force Office of Scientific Research, Arlington, VA, offered Walt a job to develop, fund and manage basic biological research programs at university and Air Force laboratories. After 20 years, he had funded over \$200M of basic research in the areas of toxicology (including hormesis), bioenergy and biotechnology. In aggregate, his programs have produced hundreds of patents/technology transfers, thousands of publications, national laser eye-safety standards, Air Force jet-fuel safety standards, and biotech startups. Some examples of his past recognition include the Exemplary Civilian Service Award (for aerospace biotechnology); Air Force Research Lab Excellence Award (for support of premier research); Special Service Award (for management); Superior Annual Performance Awards; Air Force Management and Tech Transfer Award; and Level I EPA Scientific and Technological Achievement Award (for ozone research). Currently, Walt helps advance the understanding, recognition and application of a very important and grossly under-valued biological concept—hormesis.

AWARDEE PROFILE: NEW INVESTIGATOR



CHRISTOPHER THOME

Christopher Thome, Ph.D., After receiving a bachelor of medical sciences degree from the University of Western Ontario, Dr. Thome went on to study at McMaster University in Hamilton, Ontario where he received a master's degree in health and radiation physics and a PhD in medical physics, under the supervision of Dr. Douglas Boreham. Currently, Dr. Thome is working at the Northern Ontario School of Medicine in Sudbury, Ontario, affiliated with Laurentian University. He is a member of the International Dose Response Society and the Radiation Research society.

Dr. Thome's research interests are in low-dose radiobiology, focused mainly on investigating the effects of sub-natural background radiation exposure. He is working to establish a biological research program within SNOLAB (Sudbury Neutrino Observatory), a deep underground laboratory located in Sudbury, Ontario. SNOLAB is a Nobel Prize winning facility that was designed for astroparticle physics research into neutrinos and dark matter. The laboratory is located 6,800 feet underground in an active mine. The overburden of rock reduces cosmic radiation by a factor of 50 million, making it an ideal location to study the biological effects of sub-background exposure. Using a combination of whole organism and cell culture model systems, Dr. Thome is investigating the hypothesis that natural background radiation is essential for life and that prolonged exposure to a sub-background environment could be detrimental to living systems. In addition to this work, he is also involved in initiating a clinical trial investigating the use of low-dose half body irradiation as a cancer therapeutic.

ANNOUNCEMENT

The 17th International Conference on
Adaptive Responses/Preconditioning
The Annual Meeting of the International Dose-Response Society

APRIL 17-18, 2018

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:

PRE- POST-CONDITIONING

Alzheimer's Disease/Dementia
Parkinson's Disease
Depression and PTSD
Concussions/Traumatic Brain Injury
Improving Surgical Outcomes
Stroke/Cardiovascular Disease
Diabetes
Glaucoma
Stem Cell Transplantation
Therapy

HEALTHY LIFESTYLES, AGING AND LIFE EXTENSION

Intermittent Fasting
Exercise
Chemical/Nutritional
Supplements
Low Dose Radiation and
Longevity
Adaptive response-based
cosmetics

ENHANCING HUMAN PERFORMANCE

Cognition
Endurance, Strength and Speed
Fatigue/Jet Lag: Prolong Onset/
Speed Up Recovery
Wound Healing Acceleration -
skin, tendon, muscle, bone, and
vascular

ENHANCING HEALTHY LIVING AND PERFORMANCE

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: January 31, 2018

E-mail to mbglavin@umass.edu

INTERNATIONAL DOSE-RESPONSE SOCIETY

2017 Membership Form for New and Renewing Members

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

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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