

14th Annual Space Radiation Health Investigators' Workshop
April 27-30, 2003
South Shore Harbour Resort and Conference Center
League City, Texas

(Follow the blue headings to their links)

Sunday, April 27, 2003

1:00 – 3:30	Users Group Pre-Meeting	Salons B and C
1:00 – 1:30	<i>Loma Linda Proton Synchrotron Facility Overview</i> G. A. Nelson, Loma Linda University	
1:30 – 2:00	<i>BNL Booster Applications Facility and the Alternating Gradient Synchrotron</i> D. I. Lowenstein, Brookhaven National Laboratory	
2:00 – 3:30	Review of NSRL Users Manual	
3:30 – 4:30	Registration	Hotel Prefunction Area
4:30 – 6:30	Scientific Overview Talks <i>Chairs:</i> Mary Helen Barcellos-Hoff Francis A. Cucinotta	Salons B and C
4:30 – 5:00	<i>Cancer and Aging Phenotypes in p53 Mutant Mice</i> L. A. Donehower, Baylor College of Medicine	
5:00 – 5:30	<i>Molecular Determinants of Cellular Responses to DNA Damage</i> M. B. Kastan, St. Jude Children's Hospital	
5:30 – 6:00	<i>Beyond Genomics to Proteomics: The Next Revolution in Molecular Medicine</i> D. J. Johann, Food and Drug Administration	
6:00 – 6:30	<i>Translational Research</i> Elizabeth Travis, University of Texas M.D. Anderson Cancer Center	
6:30 – 8:00	Reception	Hotel Prefunction Area

Monday, April 28, 2003

8:30 – 10:20	Welcome and DNA Damage Processing I (All sessions include work in progress as appropriate)	Salons B and C
<i>Chairs:</i>	<i>Walter Schimmerling</i> <i>Elizabeth Travis</i>	
8:30 – 8:40	<i>Welcome from NASA Chief Scientist</i> Shannon Lucid , Chief Scientist, NASA and Astronaut, STS-51G (1985), STS-34 (1989), STS-43 (1991), STS-58 (1993), and Mir 21 (1996)	
8:40 – 9:10	<i>Review of HZE Radiobiology</i> E. A. Blakely, Lawrence Berkeley National Laboratory	
9:10 – 9:40	<i>Formation and Processing of Radiation-Induced Clustered DNA Damage</i> P. O'Neill, Medical Research Council, Harwell, U.K., Radiation and Genome Stability Unit	
9:40 – 10:00	<i>Bistranded DNA Damage Clusters Induced by Low LET Radiation and Heavy Charged Particles: Formation and Repairs</i> B. M. Sutherland, Brookhaven National Laboratory	
10:00 – 10:20	<i>Low-Dose Measurement of DSBs Using a Dual-Label FAR Assay</i> B. Rydberg, Lawrence Berkeley National Laboratory	
10:20 – 10:40	Break	Hotel Prefunction Area
10:40 – Noon	DNA Damage Processing II	Salons B and C
<i>Chairs:</i>	<i>Ann Kennedy</i> <i>Amy Kronenberg</i>	
10:40 – 11:00	<i>DNA Fragmentation and Rejoining in Human Cells Exposed to Gamma-rays and Charged Particles</i> M. Belli, Istituto Superiore di Sanità	
11:00 – 11:20	<i>The Relation Between DNA-Double Strand Breaks and Mutations Induced by Heavy Ion Exposure</i> J. Kiefer, Strahlencentrum, University of Giessen	
11:20 – 11:40	<i>Cytogenetic Effects of 1 GeV/n Iron Ions Shielded with Different Materials</i>	

M. Durante, University Federico II

11:40 – Noon	<i>Truly Incomplete and Complex Chromosomal Exchanges in Human Fibroblast Cells Exposed in Situ to Energetic Heavy Ions</i> H. Wu, Wyle Laboratories	
Noon – 12:10	Poster Overview	
12:10 – 1:30	Lunch	Salons D and E
1:30 – 3:20	Cellular and Tissue Models of Signal Transduction, Aberrant Differentiation, and Apoptosis	Salons B and C
<i>Chairs:</i>	<i>Eleanor Blakely</i> <i>Michael Story</i>	
1:30 – 2:00	<i>Interaction Between Tissue and Cellular Stress Responses: TGF-β 1 Is a Key Mediator of the DNA Damage Response</i> M. H. Barcellos-Hoff, Lawrence Berkeley National Laboratory	
2:00 – 2:20	<i>Response of Thyroid Tissue Units to Space-Like Radiation Fields</i> L. M. Green, Loma Linda University	
2:20 – 2:40	<i>Apoptotic Regulation and Mutagenesis in Human Cells Exposed to Charged Particles of Importance for Spaceflight</i> A. Kronenberg, Lawrence Berkeley National Laboratory	
2:40 – 3:00	<i>LET-Dependence of the TP53 Response in Human Fibroblasts</i> R. L. Warters, University of Utah Health Sciences	
3:00 – 3:20	<i>Radiation-Induced Gene Expression in the Nematode C. Elegans</i> G. Nelson, Loma Linda University	
3:20 – 3:40	Break	Hotel Prefunction Area
3:40 – 5:20	<i>In-vivo and In-vitro Model of Carcinogenesis</i> <i>Chairs:</i> <i>Hooshang Nikjoo</i> <i>Betsy Sutherland</i>	Salons B and C

- 3:40 – 4:10 *Animal Studies of Radiation-Induced Cancer*
Robert L. Ullrich, Colorado State University
- 4:10 – 4:30 *Comparison of Preliminary Results for the Risk of
Mammary Carcinogenesis in the Sprague-Dawley
Rat with Previous Experimental Studies*
J. Dicello, Johns Hopkins University School of
Medicine
- 4:30 – 4:50 *Radiation Effects in Respiratory Tissues*
J. Ford, Texas A&M University
- 4:50 – 5:10 *Proton and Iron Radiation Effects in Transgenic
Mice*
P. Y. Chang, SRI International
- 5:10 – 5:30 *Comparative Studies Between the Effect of Alpha
Particles and Heavy Ions in Breast Carcinogenesis*
G. Calaf, Columbia University

7:00 – 10:00 **Dinner and Pier Review** **Kemah Waterfront**

Tuesday, April 29, 2003

- 8:00 – 8:40 **Accelerator Experiment Part I** **Salons B and C**
Chairs:
Michael Fry
Peter O'Neill
- 8:00 – 8:40 **Accelerator Experiment Part I** **Salons B and C**
*Refresher Course: How to Do an Accelerator
Experiment. Part I. Biology*
G. A. Nelson, Loma Linda University
- 8:40 – 9:50 **Non-Cancer Effects**
Chairs:
Michael Fry
Peter O'Neill
- 8:40 – 9:10 *Non-Cancer Effects of Radiation: What Are the
Risks and the Mechanisms?*
K. Mabuchi, National Cancer Institute
- 9:10 – 9:30 *Iron Ion-, Proton- and X-ray-effects on Human
Lens Cell Differentiation*
E. A. Blakely, Lawrence Berkeley Laboratory

9:30 – 9:50	<i>Astronauts, Exposure to Radiation in Space Flight, and Risk of Cataract</i> L. T. Chylack, Jr., Center for Ophthalmic Research, Brigham and Women's Hospital	
9:50 – 12:20 <i>Chairs:</i>	CNS Radiobiology I <i>Michael Fry</i> <i>Peter O'Neill</i>	
9:50 – 10:20	<i>Radiation and Neurogenesis</i> J. R. Fike, University of California, San Francisco	
10:20 – 10:40	Break	Hotel Prefunction Area
10:40 – 12:20 <i>Chairs:</i>	CNS Radiobiology II <i>John Dicello</i> <i>Gregory Nelson</i>	Salons B and C
10:40 – 11:00	<i>Cytotoxicity of Low- and High-LET Radiation on Neural Cells</i> M. Vazquez, Brookhaven National Laboratory	
11:00 – 11:20	<i>Effects of Exposure to Different Energies of ⁵⁶Fe Particles on Neurochemical and Behavioral Endpoints</i> B. M. Rabin, University of Maryland Baltimore County	
11:20 – 11:40	<i>Putative Dietary Prevention of the Accelerated Age-Like Effects of Heavy Particle Irradiation</i> J. Joseph, USDA Human Nutrition Research Center at Tufts University	
11:40 – Noon	<i>Assessment of Neuropathology Following ⁵⁶Fe Exposure by Magnetic Resonance Imaging and Spectroscopy</i> A. Obenaus, Loma Linda University	
Noon – 12:20	<i>The Proton Radiation Dose Response of the Rat Brain Cortical and White Matter Vasculature Compared with the Template Measured for Retinal Vessels</i> J. O. Archambeau, Loma Linda University	
12:20 – 1:30	Lunch	Salons D and E

1:30 – 4:00 Chairs:	<i>Radiation Sensitivity and Prevention Methods</i> Marcelo Vazquez John Wilson	Salons B and C
1:30 – 2:00	<i>Identification of Individuals Susceptible to Normal Tissue Injury After Receiving Radiotherapeutic Doses of Ionizing Radiation: Development of Predictive Assays of Clinical Significance</i> M. Story, University of Texas M. D. Anderson Cancer Center	
2:00 – 2:20	<i>Haploinsufficiency for ATM Confers Radiosensitivity</i> L. B. Smilenov, Columbia University	
2:20 – 2:40	<i>Genetic Sensitivity and LET Studies of Space Irradiation-Induced Genomic Instability in Vivo</i> M. A. Kadhim, Medical Research Council	
2:40 – 3:00	<i>Countermeasures for the Biological Effects of Space Radiation</i> A. R. Kennedy, University of Pennsylvania	
3:00 – 3:20	<i>The Effect of Gamma Irradiation on the Immune Responses of Mice with Polyoma Virus Infection</i> J. M. Reuben, University of Texas M. D. Anderson Cancer Center	
3:20 – 3:40	Break	Hotel Prefunction Area
3:40 – 4:00	<i>Whole-Body Irradiation and Immune Challenge with a Virus-Derived Antigen</i> D. Gridley, Loma Linda University	Salons B and C
4:00 – 5:20 Chairs:	Computational Models of Risk James Joseph Jack Miller	
4:00 – 4:20	<i>Bystander Effect and Radiation Risk: A Theoretical Approach</i> H. Nikjoo	
4:20 – 4:40	<i>Biochemical Kinetics Model of DNA Damage Processing Competition: NHEJ and HR</i> F. A. Cucinotta, NASA Johnson Space Center	

- 4:40 – 5:00 *The Two-Stage Clonal Expansion Model of Cancer*
S. B. Curtis, Fred Hutchinson Cancer Research Center
- 5:00 – 5:20 *Application of the Local Effect Model to Calculate Cell Transformation After High-LET Radiation*
M. Scholz, GSI/Biophysics
- 6:15 – 7:00 Buses Transport Workshop Participants to Space Center Houston
- 7:00 – 10:00 **Dinner Banquet** **Space Center Houston**
Plenary Talk
Franklin R. Chang-Diaz
Director, Advanced Space Propulsion Laboratory, NASA Johnson Space Center and NASA Astronaut, STS 61-C (1986), STS-34 (1989), STS-46 (1992), STS-60 (1994), STS-75 (1996), STS-91 (1998) and STS-111 (2002)

Wednesday, April 30, 2003

- 8:00 – 10:30 **Accelerator Experiment II and Radiation Critical Path Roadmap (CPR)** **Salons A and B**
Chairs: Francis A. Cucinotta
Ron Turner
- 8:00 – 8:40 *How to Do an Accelerator Experiment, Part II: Physics Considerations*
C. Zeitlin, Lawrence Berkeley National Laboratory
- 8:40 – 9:00 **Radiation Critical Path Roadmap (CPR)**
Overview of Bioastronautics Critical Path Roadmap
L. Leveton and J. Charles
- 9:00 – 10:15 Panel Discussion
Critical Path Roadmap for Radiation Health Research
- 10:15 – 10:30 **Break** **Hotel Prefunction Area**
- 10:30 – 12:35 **Physics and Dosimetry** **Salons B and C**
Chairs: Walter Schimmerling
Richard Wilkins

- 10:30 – 10:50 *One Year of Results from the Martian Radiation Environment Experiment (MARIE)*
C. Zeitlin, Lawrence Berkeley National Laboratory
- 10:50 – 11:05 *MARIE Observations of Solar Particle Events*
R. Turner, ANSER
- 11:05 – 11:20 *A New LEO ISS Environmental Model*
J. W. Wilson, NASA Langley Research Center
- 11:20 – 11:35 *Measurements of Radiation Transport in Materials Used in Human Space Flight*
J. Miller, Lawrence Berkeley National Laboratory
- 11:35 – 11:50 *Neutron Dosimetry Using Tissue Equivalent and a Silicon Equivalent Proportional Counters for Eight High-Energy Neutron Spectra*
B. Gersey, Prairie View A&M University
- 11:50 – 12:05 *Microdosimetry of Heavy Ions with Different Energies but with Similar LET*
T. Borak, Colorado State University
- 12:05 – 12:20 *Preliminary Results from the First Three ICCHIBAN Intercomparisons of Space Radiation Detectors*
E. Benton, Eril Research, Inc.

12:20 **Workshop Adjourns**

Posters

Posters will remain on view from Sunday afternoon through Monday morning

Hotel Prefunction Area

Dose Distribution in Critical Body Organs: Phantom Torso Experiment (PTE) During the ISS Increment 2 Mission
W. Atwell, The Boeing Company

A Proton Beam Delivery System for Solar Flare Simulations at LLUMC
G. Coutrakon, Loma Linda University

Quantification of Radiation-Induced Proteins Using the Luminex 100™ System

N. Desai, Wyle Laboratories

Detection of Gamma-H2AX Foci Formation in Human Peripheral Blood Lymphocytes Exposed to Accelerated Charged Particles

M. Durante, University Federico II

The Number and Reaction Multiplicities of GCR Nuclei and Delta-rays Passing Through a Cell Nucleus on a Mars Mission

X. Hu, USRA Division of Space Life Sciences

TEPC's Overestimate the Average Quality Factor for Trapped Protons and Underestimate the Average Quality Factor for GCR

M.-H. Kim, Wyle Laboratories

Simulation of Proton Beamline with MCNPX

M. F. Moyers, Loma Linda University

ALTEA: The Investigation of Brain Functional Effects of Microgravity and Cosmic Radiation

L. Narici, University of Roma

The Non-Invasive Imaging Laboratory at Loma Linda University: A Resource for NASA Scientists

A. Obenaus, Loma Linda University

The Effects of Whole-Body Gamma Irradiation on the Immune Response to LPS

M. J. Pecaut, Loma Linda University

Model Calculations and Visualization of GCR Particle Flux on the Surface of Mars

P. B. Saganti, Lockheed Martin Space Operations

Roadmapping Activities for NASA's Fundamental Space Biology Division

O. Santos, NASA Ames Research Center

Development of Collaborative Engineering Environments for Spacecraft Design

R. C. Singleterry, Jr., NASA Langley Research Center

Free Flyers: A Research Platform to Augment the International Space Station

K. A. Souza, NASA Ames Research Center

*Changes in Cocaine-Induced Locomotor Activity
After Exposure to 1 GeV/n Fe Ions and Gamma
Rays*

M. Vazquez, Brookhaven National Laboratory

Advances in Space Radiation Transport Codes

J. W. Wilson, NASA Langley Research Center

Demonstration

Immersive Design and Simulation Lab

J. W. Wilson, NASA Langley Research Center

Salon A