

RADIATION DOSE IS MORE THAN A NUMBER!

Agenda

National Institute of Standards and Technology
100 Bureau Drive, Gaithersburg, MD
Green Auditorium
September 15 and 16, 2011

THURSDAY, SEPTEMBER 15, 2011

8:00 a.m. **Arrival/Sign In**

8:20 a.m. **Welcome and Introduction**

Lisa Karam, NIST
Bert Maidment, NIAID
Norm Coleman, NCI

Why is Dosimetry Important?

8:30 a.m. **Biological Framework**

Dick Hill, Ontario Cancer Institute

8:55 a.m. **Physics Framework**

Mark Murphy, Pacific Northwest National Laboratory

9:20 a.m. **NIST traceability**

Mike Mitch, NIST

9:45 a.m. **BREAK**

Current Research Portfolio Overview (*emphasis on in vitro, small animal and large animal research categories within each portfolio*)

10:00 a.m. **NIAID Rad/Nuc Research Program**

Bert Maidment, NIAID

10:55 a.m. **NCI Rad/Nuc Research Program**

Eric Bernhard, NCI

11:20 a.m. **Other Institutions**

- Chris Lissner, DOD/AFFRI
- Noelle Metting, DOE
- Janice Huff, NASA

12:00 PM **Important Concepts in Radiobiology Dosimetry**

William Hanson



NIST



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1:00 p.m. **LUNCH**

2:00 p.m. **NIST TOUR (see addendum)**
Marc Desrosiers & Mike Mitch, NIST

3:15 p.m. **BREAK**

Survey of equipment/isotopes currently in use *(Speakers to provide summary handouts)*

3:30 p.m. **Overview**
Larry Dewerd, University of Wisconsin

3:35 p.m. **Radiation source: external beam, isotope**
Dan Bourland, Wake Forest University

3:55 p.m. **Dosimetry**
Larry Dewerd, University of Wisconsin

Current Calibration and Standardization Methods

4:15 p.m. **Calibration Methods for Medical Applications of Radiation**
Larry Dewerd, University of Wisconsin
William Hanson

4:35 p.m. **Standardization Methodologies**
Tom Seed, Tech Micro Services

4:50 p.m. **..... and How They Relate to GLP Compliance**
Michael McCreery, University of Maryland

5:00 p.m. **ADJOURN FOR THE DAY**



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FRIDAY, SEPTEMBER 16, 2011

What Can Go Wrong

8:00 a.m. **Biodosimetry bloopers**
Mike Robbins, Wake Forest University

Dosimetry case studies (*Each presentation should include scenarios and step by step “how to” guides for biodosimetry in each experimental milieu. Speakers to provide summary handouts*)

8:30 a.m. **Cell culture studies**
Woody Armour, Johns Hopkins University

9:00 a.m. **Small animal studies**
Patricia Lindsay, Princess Margaret Hospital

9:30 a.m. **BREAK**

9:45 a.m. **Large animal studies**
Dan Bourland, Wake Forest University
Tom MacVittie, University of Maryland

11:00 a.m. **Panel Discussion**
Workshop speakers and members of the audience will join Alan Liss (FDA), Andy Karellas (AAPM), Dick Hill (Int. J. Radiat. Biol.), Marc Mendonca (Rad. Res.), and Helen Stone (Int. J. Rad Onc. Biol. Phys.) in a discussion about a path forward for dosimetry standardization including and not limited to the establishment of:

- *a web page at NIST dedicated to dosimetry standardization to serve as a resource to the community for updated information, useful links and FAQ; website development?*
- *a quality control process to benefit any research employing radiation such as*
- *a dosimetry standardization service – NIH-based facility (RPC-like) or fee for service or private non-profit (AAALAC-like)*
- *standardization requirement for solicited research*

1:00 p.m. **ADJOURN**



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ADDENDUM

Guided tours of the following facilities will be offered right after lunch on Sept. 15, 2011:

Gamma-ray dosimetry

The high-dose dosimetry program supports industrial/medical irradiation applications by assuring that the absorbed dose to the product, often prescribed or limited by regulatory agencies, is traceable to NIST standards. In addition, our most accurate measurements using small alanine-pellet dosimeters for these high-dose processes show promise to provide traceability to national measurement standards in clinical applications for the small-field radiation beams increasingly being used in radiation therapy.

PET/CT

As part of a NIST-wide effort to develop a metrological infrastructure for quantitative medical imaging, the Radioactivity Group has recently established a dedicated facility to support its efforts to develop the necessary standards and measurement techniques for quantitative PET-CT. The centerpiece of the facility is a new state-of-the-art Philips Gemini TF PET-CT scanner with time-of-flight capability. The availability of a dedicated scanner allows NIST to ensure that the standards being developed are relevant and allows for methods to be developed to transfer those standards to the clinic.

Clinac

The NIST Clinac facility features a Clinac 2100C radiotherapy accelerator that is used in medical dosimetry research and dose calibrations. This accelerator produces electron beams of 6, 9, 12, 16 and 20 MeV and photon beams of 6 and 18 MV at dose rates of 80 cGy/min to 400 cGy/min. In a recent NIST/BIPM bilateral comparison, the Clinac facility was used to evaluate the NIST primary photon standard against the BIPM primary standard. Future plans for the Clinac facility include the establishment of a primary calibration laboratory for high-energy photon and electron dosimetry.

Sign-up sheets will be available outside the meeting room during the Sept. 15 morning session.

