

About Radiation Biodosimetry

Medical management of suspected radiation casualties requires multiple parameter biological dosimetry.

Useful parameters include the assessment of radioactive contamination, clinical signs and symptoms, physical dosimetry, and early-response changes in hematology, blood chemistry, and protein biomarkers.

In cases of mass casualties and radiological terrorism, military and civilian first-responders must be able to triage individuals in the field.

Biodosimetry Mission

Identification, optimization, and validation of integrated biodosimetry assays for military and civilian applications with the following emphases:

- Rapid and field deployable capability
- Enhancement of reference biodosimetry capability
- Identification and validation of radiation specific biomarkers for early phase, organ-specific, and late effects

Recent Publications

Blakely WF, Ossetrova NI, Whitnall MH, Sandgren DJ, Krivokrysenko VI, Shakhov A, Feinstein E (2010) [Multiple parameter radiation injury assessment using a nonhuman primate radiation model—biodosimetry applications.](#) *Health Phys.* 98(2):153–9.

Ossetrova NI, Sandgren DJ, Gallego S, Blakely WF (2010) [Combined approach of hematological biomarkers and plasma protein SAA for improvement of radiation dose assessment in triage biodosimetry applications.](#) *Health Phys.* 98(2):204–8.

Prasanna PGS, Moroni M, Pellmar TC (2010) [Triage dose assessment for partial-body exposure: Dicentric analysis.](#) *Health Phys.* 98(2):244–51.

Waller E, Millage K, Blakely WF, Ross JA, Mercier JR, Sandgren DJ, Levine IH, Dickerson WE, Nemhauser JB, Nasstrom JS, Sugiyama G, Homann S, Buddemeier BR, Curling CA, Disraelly DS (2009) [Overview of hazard assessment and emergency planning software of use to RN first responders.](#) *Health Physics*, 97(2):145–156.

Grace MB, Blakely WF (2007) [Transcription of five P53-and Stat-3-inducible genes after ionizing radiation.](#) *Radiation Measurements* 42(6–7):1147–1151.

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Biological Dosimetry Research Program

Dosimetry
the process of
measuring radiation dose



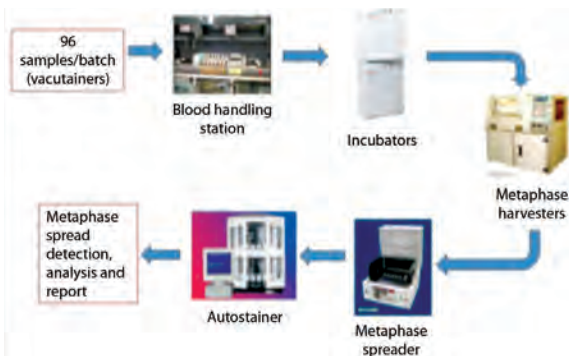
CURRENT RESEARCH

Efforts transitioning to operational biodosimetry practice



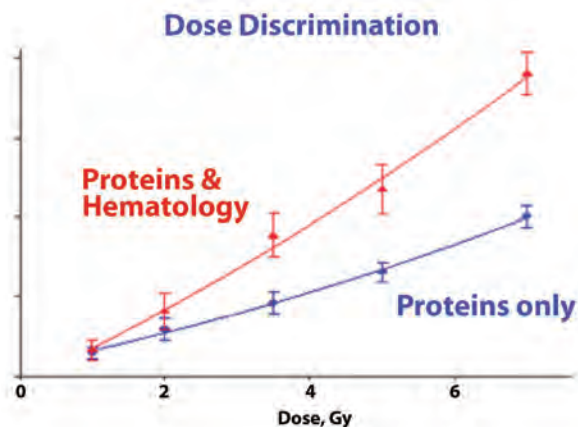
- Development of medical recording and software-based applications and worksheets to facilitate management of radiation dose and injury assessment
- Integration of multiple-parameter early-phase biodosimetry for clinical biodosimetry applications
- Characterization of prodromal clinical signs and symptoms for radiation exposure diagnostics
- Combined use of hematology biomarkers with clinical signs and symptoms for radiation dose assessment

Automation of cytogenetic assays for radiation dose assessment



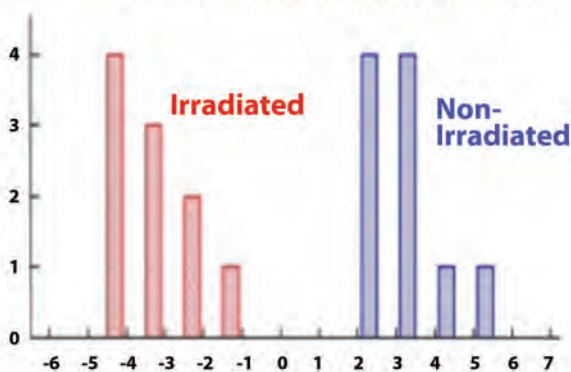
Immunodiagnosics Blood Protein Bioassay

- Validation of blood proteomic, metabolomic, and urinary biomarkers for early-phase and organ-specific radiation injury and dose assessment



- Identification of radiation bioassays, using nucleic-acid-based detection methodology, for early-expressed and persistent radiation late effects

Multiparameter Discrimination



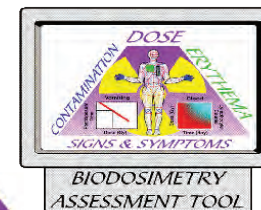
RESOURCES

AFRI Web site

<http://www.afri.usuhs.mil>

Medical data forms and software tools

<http://www.afri.usuhs.mil/outreach/biodostools.htm>



Guidance

<http://www.afri.usuhs.mil/outreach/guidance.htm>



Medical Effects of Ionizing Radiation Course

<http://www.afri.usuhs.mil/outreach/meir/meir.htm>

Online dose estimator

http://www.remm.nlm.gov/ars_wbd.htm



BAT deployment

<http://www.mc4.army.mil>