

## **CRP E35008**

### ***Strengthening of “Biological dosimetry” in IAEA Member States: Improvement of current techniques and intensification of collaboration and networking among the different institutes***

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#### **Summary:**

Currently, in low and middle income countries, there is a strong increment in the application of nuclear technologies, especially in the fields of electrical power/energy management, in the field of research, and in human health. For these countries, this implies an increase in nuclear power plants, more nuclear research facilities and more radiation facilities for medicine (radiation oncology and radiation diagnostics). In spite of strict regulations and safety measures, radiation accidents or unplanned radiation exposures may occur. Biological dosimetry implies different cytogenetic assays and is used to estimate the absorbed dose in the exposed individual. Biodosimetry plays an important role in the triage and medical management of radiological casualties. The availability of national and regional biodosimetry programmes / laboratories will be very useful not only in the case of a nuclear disaster but also for radiation workers in environments with a certain radiation risk and for the general public. The major aim is to increase the preparedness of biological dosimetry laboratories / institutes in IAEA Member States (MSs) to react on radiation / nuclear accidents. The rationales are: to set up suitable standards to monitor individuals exposed to radiation, to update the existing technology, introduce “state of the art” technology and to initiate national, regional and international networks on biological dosimetry that can be extremely useful in scenarios of mass casualties.

#### **Research Objectives:**

- The major goal of the project is to increase the preparedness of biological dosimetry laboratories in IAEA and Member States to react on radiation and nuclear accidents nationally and in the region.
- To implement adequate technical information and expertise in participant countries to perform biological dosimetry.
- To update conventional and to implement state-of-the-art cytogenetic assays for retrospective biological dosimetry after exposure to ionising radiation of different qualities.
- To unify/harmonise cytogenetic assays among different laboratories.
- To monitor individuals exposed to radiation environmentally, occupationally, clinically as well as accidentally.
- To complement and to develop IAEA and WHO activities in this field.

#### **Expected Research Outputs:**

- To implement adequate technical information and expertise in LMI-countries to perform biological dosimetry and human risk assessment (i.e. in scenarios of environmental, occupational, clinical and accidental exposures to radiation of different qualities at low and high dose levels).

- To update conventional biological assays and to implement state of the art technology in research centres having expertise on applying different types cytogenetic assays for biological dosimetry immediately and/or retrospectively following (controlled and uncontrolled) exposure to radiation of different qualities.
- To unify/harmonize technically cytogenetic assays that are applicable for human biological dosimetry among different laboratories in the MSs, and by initiating different networks (national and international collaborations).
- To initiate and give advice on different relevant research programs in order to enhance the current and future research programs to assess precisely the effect of ionizing radiations and human risk.
- To monitor individual exposed to radiation environmentally, occupationally, clinically as well as accidentally.
- To complement and to add to already existing IAEA and WHO activities in this field; RANET (IAEA-Incidence and Emergency Unit, Nuclear safety); BiodoseNet (WHO).

**Participating institutions:**

<i>Country</i>	<i>City</i>	<i>Institution</i>
FRANCE	BRÉTIGNY-SUR-ORGE	Institut de Recherche Biomédicale de Armées (IRBA)
JAPAN	CHIBA	National Institute of Radiological Sciences (NIRS)
JAPAN	HIROSHIMA	Hiroshima International Council for Health Care of the Radiation-exposed
CANADA	OTTAWA	Health Canada
CHINA	BEIJING	National Institute for Radiological Protection and Nuclear Safety
CHINA	BEIJING	Beijing Institute of Radiation Medicine (BIRM)
CUBA	LA HABANA	Centro de Protección e Higiene de las Radiaciones (CPHR)
GEORGIA	TBILISI	Institute of Haematology and Transfusiology
GHANA	LEGON ACCRA	Radiological and Medical Sciences Research Institute
INDIA	SHILLONG	North-Eastern Hill University
INDONESIA	JAKARTA	Center for Technology of Radiation Safety and Metrology
LITHUANIA	VILNIUS	Radiation Protection Centre
MALAYSIA	SELANGOR	Malaysian Nuclear Agency

PHILIPPINES	QUEZON CITY	Philippine Nuclear Research Institute (PNRI)
POLAND	KRAKOW	Henryk Niewodniczanski Institute of Nuclear Physics (IFJ)
REPUBLIC OF KOREA	JEONGEUP	Korea Atomic Energy Research Institute (KAERI)
REPUBLIC OF KOREA	SEOUL	Korea Institute of Radiological and Medical Sciences (KIRAMS)
RUSSIA	ST. PETERSBURG	Nikiforov Center Emergency and Radiation Medicine EMERCOM of Russia
SINGAPORE	SINGAPORE	National University of Singapore
SRI LANKA	RAGAMA	University of Kelaniya
THAILAND	BANGKOK	Kasetsart University
UKRAINE	KHARKIV	Grigoriev Institute for Medical Radiology
URUGUAY	MONTEVIDEO	Instituto de Investigaciones Biológicas "Clemente Estable"
VIET NAM	DALAT	Nuclear Research Institute (NRI)