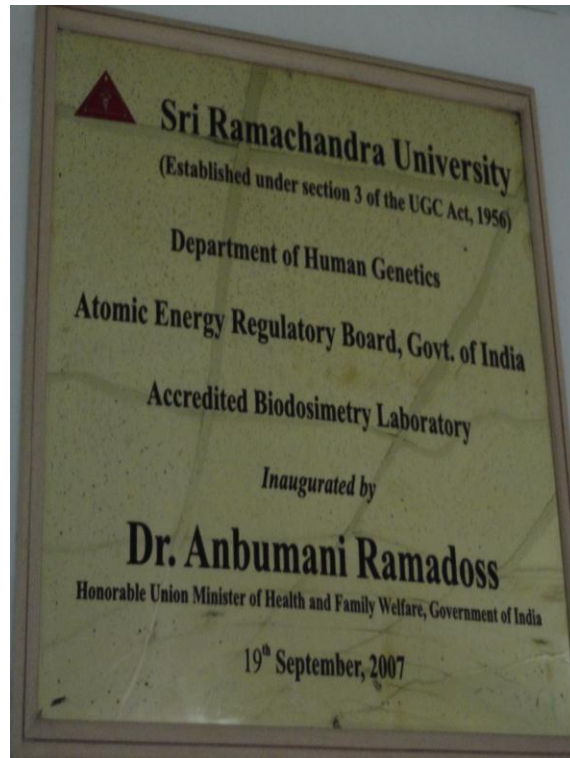




**SRI RAMACHANDRA MEDICAL CENTRE
DEPARTMENT OF HUMAN GENETICS
ATOMIC ENERGY REGULATORY BOARD ACCREDITED
BIODOSIMETRY LABORATORY**

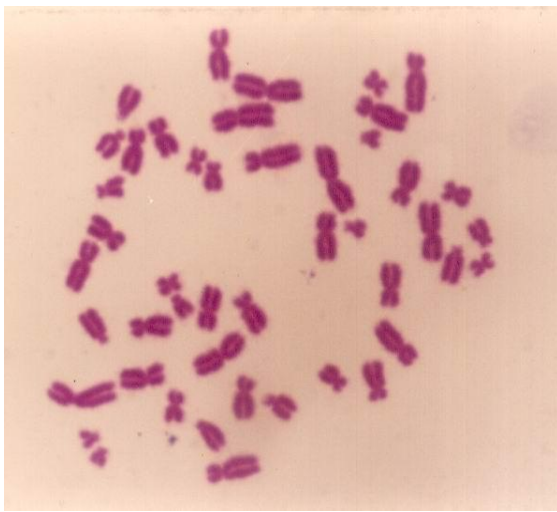


About the laboratory

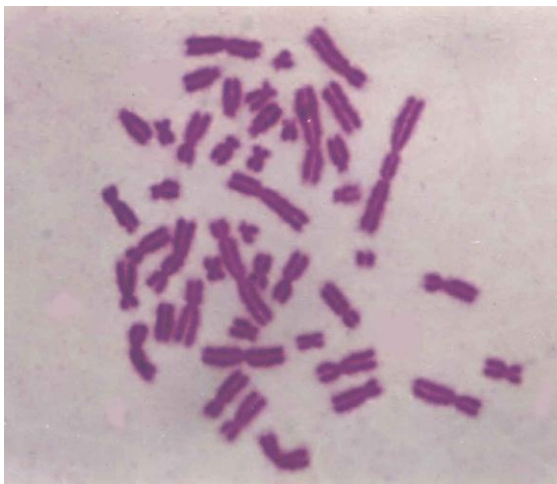
The AERB-accredited Biosimetry laboratory was officially inaugurated by the then Honorable Health Minister of India, Dr. Anbumani Ramadoss, on 19th September 2007, along with the University Day celebrations. It created awareness among the faculty and student community of our University. The laboratory has well-established state of art infrastructure, equipments, and expertise to quantify radiation absorbed dose using dicentric, the gold standard cytogenetic biomarker. This has been done in close collaboration with the Bhabha Atomic Research Centre (BARC), Mumbai, under the auspices of AERB. The department of Human Genetics has also received many external funded projects since 2002 to assess and validate other biomarkers that have potential to be used for biosimetry. The laboratory has also been instrumental in creating awareness on radiation protection. An international conference on Radiation Biology (ICRB-NISSRO-2010) was organised in collaboration with the Indian Society of Radiation Research during 14-17th November 2010. Further, a workshop on “Radiation Awareness Programme (RAP – 2011)” was jointly organized by SRU and the Indira Gandhi Centre for Atomic Research (IGCAR) in Aug 2011. Continuous research activities are in progress to improve the sensitivity and new techniques with the funding support of national and international agencies.

About biodosimetry

When ionising radiation traverses through the cell it deposits its energy. The deposited energy induces certain biochemical, biophysical, immunological and chromosomal changes (biomarkers) in a cell. The changes arise either by direct interaction of incident energy photons with the DNA or through free radicals by interacting with water molecules which in turn affect the biomolecules. The damage caused to biomolecules by the direct interaction of radiation is known as direct action and that caused through free radicals is known as indirect actions of radiation. Measurement of these changes is generally precise and can be used to relate to the absorbed dose. Quantification of absorbed dose using any biological markers is known as "Biodosimetry". The principle of the biodosimetry is based on the relationship between the frequency of markers and the amount of absorbed dose.

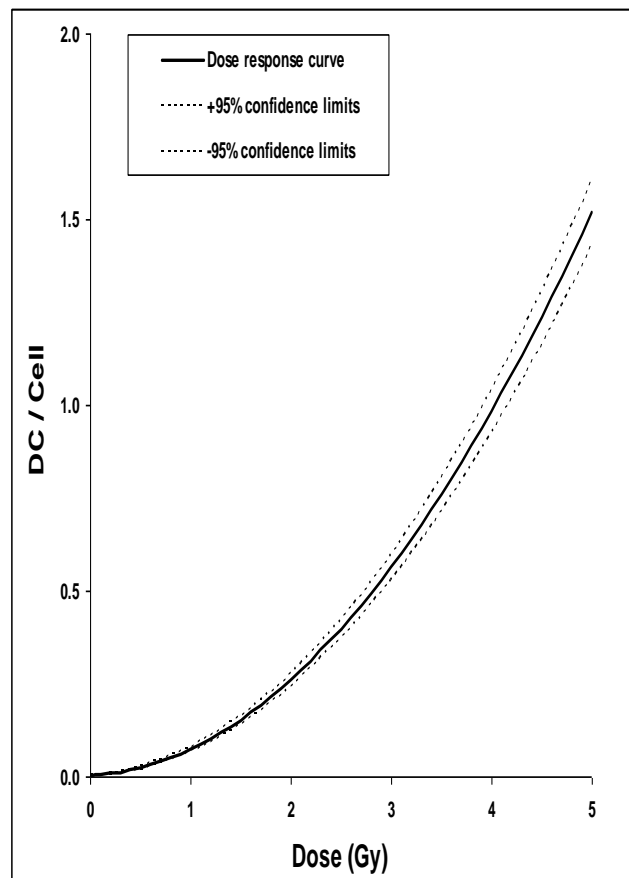


Normal metaphase chromosomes

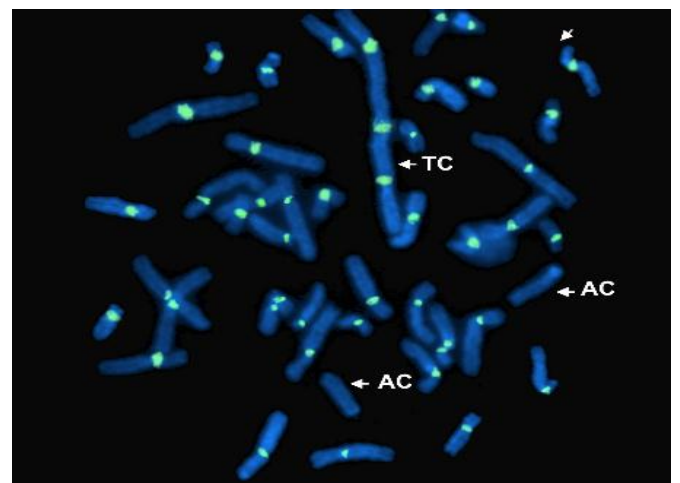


Giemsa stained metaphase showing dicentric chromosomes

Fluorescence in situ hybridization showing tricentric chromosome and acentric fragments



A dose-response curve



Projects conducted			
Funding Agency	Title of the project	Duration	Sanctioned amount (Lakhs)
AERB	Somatic cell mutational assay of Glycophorin-A (GPA) using monoclonal antibodies for Biological dosimetry.	2001-2004	17.10
AERB	Biological Dosimetry Preparedness - Validation on the measurement of translocation frequency by chromosome painting and G-banding	2002-2006	18.43
DST	Genomic instability in bystander human cells and their progeny exposed to Ionizing radiation using 3-D cultures	2007-2010	23.0
DRDO	Emergency dosimetry preparedness	2008-2010	9.42
DRDO	Inter laboratory comparison of radiation dose response calibration curve using DC assay	2011-2013	14.93

Milestones

- Receipt of accreditation in 2007 as the only non-governmental institute to undertake biodosimetry.
- Organised an international conference” International Conference on Radiation Biology – Nanotechnology, Imaging, Stem Cell & Radiation Oncology (ICRB-NISRO-2010).
- Conducted the “Radiation Awareness Programme (RAP 2011) jointly with the Indira Gandhi Center for Atomic Research in Aug 2011.

Publications in the area

Journal

1. Venkatachalam P, Solomon F.D. Paul, Harpreet Kaur and R.K. Jeevanram (2011), Standardization and validation of cytogenetics markers to quantify radiation absorbed dose. Defence Science Journal, 61(2): 125-132.
2. Damania Preethi, Harpreet Kaur, Solomon F.D. Paul, Thayalan K., Balu David M. and P. Venkatachalam (2009), Effect of dose rate and energy on the yield of chromosomal aberrations in peripheral blood lymphocytes exposed low LET ionizing radiation. Brachytherapy News, 1: 13-17.
3. Harpreet Kaur, Solomon F.D. Paul, VR, Jayanth, Thayalan, K. Balu David and P. Venkatachalam (2007) In vitro dicentric and micronucleus dose response curves for C0-60 gamma radiation for biodosimetry. Indian J. Radiat. Res., 4: 10-18.
4. Harpreet Kaur, P. Venkatachalam, and Solomon F.D. Paul, Analysis of radiation induced translocations. International Conference on Genomics, Genetic disease and diagnostics” Manipal University, Manipal, 14-16th February 2011.

Conference Presentations

1. Harpreet Kaur, Solomon F.D. Paul, Thayalan, K. Balu David and P. Venkatachalam. Studies to validate translocation measurement in peripheral blood lymphocytes using whole chromosome painting and GTG banding for biological dosimetry. 29th IARP national conference on Recent advances in radiation dosimetry, BARC, Mumbai, 3rd to 5th February 2010.
2. Solomon F.D. Paul, H. Kaur and Venkatachalam, P. Radiation dosimetry preparedness: ARA-C and its importance in improving the qualities of MN assay. International Conference on Radiation Biology; Radiation Biology & Translational Oncology, Rajasthan University, Jaipur, November 2008.

Objectives of the Laboratory

- To focus on harmonization of methodology, quality assurance and inter-comparison exercises.
- To conduct periodic awareness programs in order to provide basic information on radiation protection to those without formal radiation medicine expertise.
- To update the knowledge on biodosimetry on a periodic basis in order to be up to date with current international / national standards recommended for biodosimetry.



AERB Accreditation

Name and communication details of the nodal faculty

- Dr. P. Venkatachalam, Professor
- Dr Solomon D.D. Paul, Professor
- Dr. Harpreet Kaur, Asst. Professor
- Ms. J. Vijayalakshmi, Asst. Professor
- Ms. M. Bhavani, Reserach Scholar
- Ms. Safa Basheer, Reserach Scholar

Dept of Human Genetics
Sri Ramachandra University
Porur, Chennai 600116
Ph: 24765995 Ext: 237,176



International Conference on Radiation Biology



Seminar on Radiation Safety Awareness