

Radiological Risk and Safety Assessment

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The group has the specific competence of performing the radiation risk and safety assessment of installations and therefore is concerned with the potential detrimental aspects in the population that might arise from radiological practices. While radiation safety assessment aims to prevent stochastic effects, the participation in some projects dealing with therapeutic range of doses aims to study deterministic effects. Another goal of this group is to have good expertise in dose assessment and calculation. This can be achieved by implementing both Monte Carlo and analytical methods, to assess the radiological risk of radiological practices in research activities and other sectors such as in medicine and in the industry.

The group is structured in two subgroups: one dealing with radiation dosimetry issues and the other with the biological effects of radiation. In addition to the specific tasks of each subgroup, we envisage the participation in research projects relating dosimetry with biologic radiation effects and therapy.

Concerning the activities related to the biological effects of radiations, the main activity of the subgroup was in the project MinUrar, a study on the effects of uranium mine tailings on public health. The activities consisted in the application of techniques of chromosome painting with DNA FISH probes. This includes the cytogenetic analysis in blood samples of people living nearby uranium mines.

Special emphasis and effort was devoted to the manipulation of computational tools for applications involving the evaluation and assessment of doses for multiple applications. Computational shielding design using Monte Carlo or deterministic methods, acquired an increasing importance supporting assessment and design of shields around radiation sources or x-ray

machines used for diagnostic and therapy. One of the priorities was to keep abreast of the state-of-the-art computational techniques used for radiation shielding and radiation dosimetry calculations.

The acceptance by society of risk associated with radiation is conditional on benefits to be gained from the use made of radiation.

The entity authorized to engage a practice involving a source of radiation should bear the primary responsibility for protection and safety. This is one of the major enhancements in our safety reports, last year, helping the General Directorate of Health of the Ministry of Health in licensing. A safety culture should be inculcated that governs the attitudes and behaviour in relation to protection and safety of all individuals and organizations dealing with sources of radiation.

We developed some efforts to increase the safety culture in the radiological installations of the country. Protection and safety should be ensured by sound management and good engineering, quality assurance and adequate training and qualification of personnel.

Training of workers, is one essential component of the radiological protection system and this group has played a major role in these activities fostering planning and organizing several education and training programs.

The research carried out in radiation dosimetry is concerned with photon track description in energy range 10 – 150 keV and in the development of methodologies in cellular dosimetry with several radionuclides of importance in therapy.

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Research Team

Researchers

- A. D. OLIVEIRA, Auxiliary Researcher, group leader
- M. A. NEVES, Principal Researcher
- P. VAZ, Principal Researcher
- O. GIL, Auxiliary Researcher
- M. L. PEDRO, Auxiliary Researcher

Students

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Technical Personnel

- M. ÂNGELO

Funding (€)

Research Projects:	9.791,00
Services:	92.281,00
Total:	102.072,00

Publications

Journals:	5 and 3 in press
Proceedings:	10 in press
Conf. Communications:	2
Internal Reports:	11
Theses: MSc	1