defined within that. The dose enhancement factor (DEF) has been calculated to compare the effects of GNPs in laser therapy of eye melanoma. In the In Vitro phase of this work the uveal Melanoma cells were cultivated in DMEM with 20% FBS. In the seventh passage the cells were grown on a 24-well plate in which the first five wells incubated with different concentrations of gold nanoparticles and the sixth well saved as control.
Results and Discussion: The MTT assay was done in order to evaluate the toxicity of these nanoparticles, so as to define the preferred concentrations of GNPs. After the cytotoxicity assay and determination of the concentration range of these nanoparticles, the sample has been injected by GNPs, then the dosimetry has been done after irradiation of target with laser beam. Within a time span of 48 hours, and also a week after the injection of the noted substances, viability of cells were evaluated with MTT assay. The results show that the higher concentration of GNPs show a higher decrease in cell viability. Making a comparison between Laser beam, cobalt source and low dose rate sources such as Iodine and Palladium in the study of the effects of GNPs in cancer therapy reports very interesting results and motivated us to do a full in vivo study in this regards. Regarding the numerous sources that are employed in the radiotherapy of the eye Melanoma, the possible effects of these sources, whilst accompanied by GNPs, is a matter of heated debate in altering the period of treatment and requires more comprehensive investigations. A full experimental investigation of the effects of GNPs on Choroidal Melanoma against different radiation sources could answer this question.

KeyWords: Diod Laser Beam, Choroidal Melanoma, GNPs

11

A systematic Monte Carlo study on the dosimetric and imaging properties of C-11 and O-15 beams.

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Carbon ion therapy has been pioneered in USA since 1975[1], and in routine clinical use in Japan since 1994[2]. More recently, it has also been implemented in Europe (HIT, CNAO, MIT and soon MedAustron) and China, and more facilities are currently under planning worldwide[3]. The rationale behind hadrontherapy with carbon ions has to do with their better ballistic properties and higher LET (Linear Energy Transfer) when compared to the more widespread protons. The drawback being their greater complexity for production, planning and delivery[4].
Recent improvements in post-accelerated beam technology are expanding the range of beams available to include also radioactive nuclides, beyond the ^{12}C ion species, currently utilized for carbon ion therapy[5]. Furthermore, Monte Carlo particle transport codes such as FLUKA[6,7], which has been used in this work, are becoming even more refined and therefore suitable for use in treatment planning and in-vivo verification techniques aiming to improve the treatment dose assessment[8].
In this work, we systematically study the dosimetric performance and imaging properties of ^{11}C in a water phantom. These add up to the advantages of conventional ^{12}C ion therapy a stronger imaging signal, potentiating in-beam monitoring, and later dose intake assessment using PET instrumentation technologies. In addition to that, a similar study has been performed for ^{15}O.
FLUKA results confirmed the high potential of ^{11}C and ^{15}O in imaging, the former presenting no significant absorbed dose drawbacks compared to ^{12}C.

Keywords:
Carbon ion therapy, FLUKA, PET imaging

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12

ODSH as a countermeasure for radiation-induced thrombocytopenia: Dosimetric studies

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Purpose: The molecule ODSH has shown great promise in preliminary studies suggesting that it improves platelet count recovery and impacts survival when the sodium form is given as a subcutaneous injection[1]. A new formulation of the molecule will be studied and radiation physics support will be provided to assure accuracy of the results. Expansion of the program for these studies will include performing dose ranging and PK/PD studies in mice for the novel formulation as well as some biology studies examining the biology of the mechanism of action of the molecule. The dosimetric studies will characterize the radiation source in terms of dose rate and energy. Maintaining the accuracy and precision of the radiation exposure throughout the project is a key factor to understanding the biological effects[2]. Dose uniformity and reproducibility will be monitored throughout the project to minimize dose uncertainty.
Materials/Methods: Precision X-ray 320[3] was calibrated following TG-61 protocol. EBT2 film was exposed at 200, 400, 600 and 800 cGy to create calibration curve to be used in FilmProQA software developed by Ashland technologies. Mouse irradiations were taken 320kV, 12.5 mA to a total dose of 650 cGy. Gafchromic film was placed under the mice during irradiations and later analyzed with FilmProQA[4] to determine accuracy and uncertainties during the experiment. Film exposures were taken at 800 cGy before each measurement to adjust the calibrations curve for daily variations of the x-ray tube.
Results: Film analysis determined that dose uniformity in the irradiator can vary due to scatter and experimental setup and have an effect on the outcome of your experiment.
Conclusions: For experiments with small animal irradiators a quality assurance program should be an integral part of any radiation biology study.

Keywords: Radiation protection, quality assurance, small animal

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