

PRODUÇÃO TÉCNICO CIENTÍFICA
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Updating of Two-Step Model for the neutron interaction with the DNA in BNCT Research facility of IPEN.

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The main objective of contemporary clinical treatments to establish the maximum dose acceptable to be delivered in the healthy tissue during radiation therapy. The critical parameter here is the cell survival after irradiation, which is related to the damage induced in the DNA. Therefore, the study of radiation induced in the DNA is not only interesting from the academic point of view, by quite important in practical applications too.

In this work, we plan to investigate the neutron-induced damage in the DNA molecule. We will irradiate pBlueScript II KS plasmids with thermal, epithermal and fast neutron from the BNCT (Boron Neutron Capture Therapy) Research facility at the IEA-R1 m reactor of IPEN-CNEN-SP.

In order to study the neutron-DNA interaction, we will analyze the single strand break (SSB) and double strand break (DSB) damage in the irradiated plasmids. These two kinds of damage can be easily verified through the Agarose Gel Electrophoresis technique.

Several experiments difficulties are present in this experiment. One of the most important is the gamma contamination of the neutron flux. We will perform the calculations with Monte Carlo N-particle transport code system version 4C (MCNP-4C) to find the experimental conditions necessary to minimize such contamination, and also we will investigate possible experiments to verify the effects of those gamma's on the DNA molecule.

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