THE POSSIBILITY OF USE OF ANTIPROTONS IN CANCER THERAPY

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Proton therapy has been employed successfully for eye melanomas, sarcomas near the neck, and in treating prostate cancer. In contrast to traditional x-rays, which deposit their energy along their path through the body, the selectivity of proton therapy, offers a huge advantage. Protons deliver only a low dose of energy upon entering the body. The dose then slowly increases to a maximum level when the beam reaches the cancerous target and subsequently drops to zero upon exiting the body. However, many tumors have proven to be radio-resistant, i.e. having the ability to repair the damage done by the proton beam. One of the possibilities to increase the effectiveness of cancer therapy is introducing the use of antimatter (antiprotons).

Antiprotons will be far more lethal to the tumor cells than protons or even ions while still minimizing collateral effects to the surrounding healthy tissue. Early test experiments at the European Center for Nuclear Research (CERN) in Geneva, Switzerland indicated a significant enhancement in the biological effectiveness of antiprotons compared to protons delivered under similar conditions to a biological target. The main challenge in the design of this experiment is obtaining the maximum of biological information with the limited number of antiprotons available