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Investigating the Relative Biological Effectiveness of a Hydrogen Plasma Beam on Breast Cancer Cells KELLY DONOVAN, SUSAN THOMAS, KATE HUGGLER, ROBERT O'DONNELL, STEPHEN PADALINO, SUNY Geneseo — Proton therapy has become an accepted form of radiation therapy for tumors in the head, brain, neck, lung and prostate. Compared to other forms of radiation, protons can be applied to a more localized area. Due to the unique energy deposition of the proton beam which produces a flattened Bragg peak in the energy spectrum, it is possible to avoid damaging healthy tissue around the tumor. Past studies have consistently shown survival curves for healthy tissue which indicate effective doses in the range of 2-20 Gy. This study utilized a NEC 5SDH Tandem Pelletron Accelerator in the investigation of the irradiation effects on breast cancer cells. A 3 MeV proton beam passed through a 25 micron thick Kapton window which allowed the cells to remain in atmosphere while being irradiated. Proton energy loss and beam straggling through Kapton and air were determined theoretically using TRIM and confirmed by calibration experiments. A shutter system placed between the window and the cell sample was used to control radiation exposure time. A range of radiation exposure times were tested in an attempt to find the optimal dose.

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