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Biological Response of Cancer and Normal Cells on Irradiation from Electrons with Energies up to 200 keV. YURIY PRILEPSKIY, Hampton University, JLAB, CAMI COLLABORATION, HAMPTON UNIVERSITY COLLABORATION — This paper presents continuation data of the series of experiments with the electron gun of the CEBAF machine at Jefferson Lab (Newport News, VA), which is capable of delivering electrons with energies up to 200 keV. This 1.5 GHz beam permits to generate cellular damage within minutes. We have performed irradiation of cancer and normal cells with different electron energies and currents to investigate cell biological responses. The biological response is measured through proteomics analysis before and after irradiation. The living cells are encased in special air containers allowing proper positioning in vacuum where the electrons are present. The containers receive the irradiation from the mono energetic electrons with energy up to 120 keV, resulting in an irradiation from both electrons and a small number of photons from the original beam passing through the thin container window. This window allows approximately half of the beam to come through. The study will permit to address the physical processes involved in the RBE and LET at a level that supersedes current data listed in the literature. We will discuss the experimental setup and the second stage of data collected with the new more developed system. This research is part of a global program to provide detailed information for the understanding of radiation based cancer treatments.

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