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EXPRESSION PROFILE OF DNA DAMAGE SIGNALING GENES IN 2 GY PROTON EXPOSED MOUSE BRAIN.

Abstract

Exposure of living systems to radiation results in a wide assortment of lesions, the most signicant of is damage to genomic DNA which alters specic cell functions including cell proliferation. The radiation induced DNA damage investigation is one of the important area in biology, but still the information available regarding the effects of proton is very limited. In this report, we investigated the differential gene expression pattern of DNA damage signaling genes such as damaged DNA binding, repair, cell cycle arrest, checkpoints and apoptosis using quantitative real-time RT-PCR in proton exposed mouse brain tissues. The expression profiles showed signficant changes in DNA damage related genes in 2 Gy proton exposed mouse brain tissues as compared to control brain tissues. Furthermore, we also show that signicantly increased levels of apoptotic related genes, caspase-3 and 8 activities in these cells, suggesting that in addition to differential expression of DNA damage genes, the alteration of apoptosis related genes may also contribute to the radiation induced DNA damage followed by programmed cell death. In summary, our findings suggest that proton exposed cells undergo severe DNA damage which in turn destabilize the chromatin stability.