state in cancerous cells and sensitize them to radiations.

Reference

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3 - 52 Unfolded Protein Response Induced by X-rays in Breast Cancer Cells

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Expand ER stress is triggered due to the loss of homeostasis in the ER which causes the accumulation of misfolded proteins within the ER lumen. Severe or prolonged ER stress may induce the unfolded protein response (UPR), which is an adaptive mechanism aimed at reducing levels of unfolded proteins and keeping balance in the ER. CHOP, Bip, JNK, EIF2α are major elements in these pathways.

In this study, we investigated the activation of CHOP, Bip, total JNK and phosphorylated JNK (P-JNK), total EIF2α and phosphorylated EIF2α (P- EIF2α) in response to X-rays in breast cancer MCF-7 and MDA-MB-231 cells using western blot analysis. As shown in Fig. 1, doses of 2 and 8 Gy were given and the detection time points post-irradiation were 0.5, 1, 2, 4, 6, 8, 12 and 24 h, respectively, whilst untreated cells were used as control. Our results show that ER stress was stimulated after X-ray irradiation. At 6, 8, 12 and 24 h post-irradiation, accumulation of CHOP was detected upon 2 Gy, whilst pronounced accumulation of Bip can be detected on both 2 and 8 Gy. Moreover, JNK (at 0.5, 1 and 2 h post-irradiation) and EIF2α were also phosphorylated and activated by the ER stress in a time-dependent manner. Therefore, we propose that ER stress was stimulated in breast cancer MCF-7 and MDA-MB-231 cell lines after X-ray irradiation.

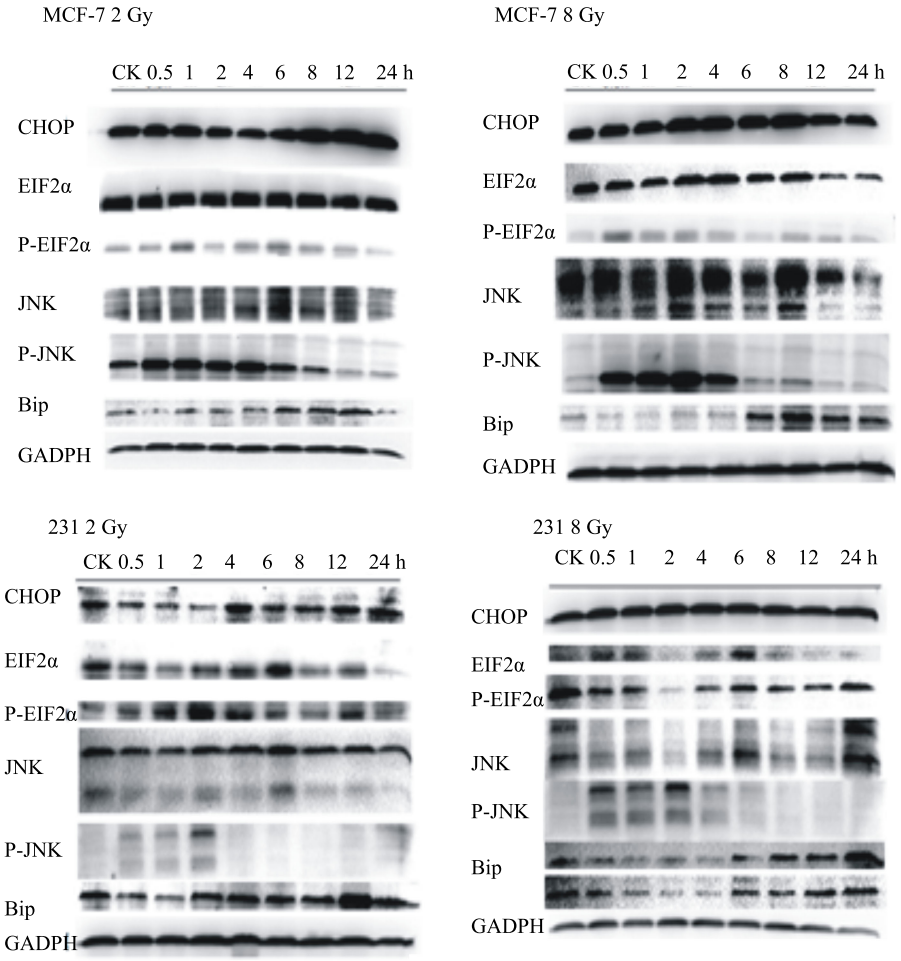

Fig. 1 UPR related key protein expressions of breast cells exposed to X-rays.