

In vitro Studies of Chemotherapeutic Drug Sensitivity on Acquired Radio-resistance Breast cancer cells

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SUMMARY

Acquired resistance of cancer cells to radiation therapy remains a major drawback to successful treatment. Mechanisms leading to radioresistance are varied and inadequately defined; however recent experimental records support the concept that cancer stem cells are more resistant than cancer cells. Multidrug resistance (MDR) is a significant obstruction for effective chemotherapy in many patients.

Fractionated radiation dose therapy is a routine procedure for the breast cancer treatment. However, despite of continuous improvement, tumor recurrence occurs in high proportion of the patients. There is a need of suitable radioresistance cell line system to study the properties of tumor recurrence. But, developing a radioresistant cancer cell line is a time requiring process. It requires a multiple radiation dosages for a period of three to four months. The present study aims for the new strategy to develop a radioresistant breast cancer MCF-7 cell line.

The approach followed in the current study for developing radioresistant cell line has reduced the time and dose requirement, also succeeded in obtaining resistant characters in it.

Multifactorial in etiology, classic MDR is associated with the overexpression of P-glycoprotein (P-gp), resulting in increased efflux of chemotherapeutic drugs from

cancer cells. The present study was focused to find the drug-5-Fluorouracil (5-FU) resistance character, such as P-gp overexpression in developed radioresistant breast cancer MCF-7 cell lines. The radioresistant cell characters were generated by exposing the cells to 10Gy dosage and the resistant cells were collected from colonies of the clonogenic assay. The resistant characters were assessed by measuring the antiapoptotic protein Bcl-2 level. The P-gp levels in these cells were analysed using flowcytometry. The study concludes that radioresistant cells over expresses P-gp which leads to the development of drug resistant character. These cells will be less sensitive to 5-FU treatment, to increase the sensitivity the concentration of the drug may have to be increased or P-gp blockers can be used to enhance the 5-FU sensitivity.