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RADIORESISTANCE OF TUMOR STEM AND NON-STEM CELLS AFTER GAMMA RADIATION

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A stem cell-like subpopulation known as “cancer stem cells”(CSCs) has been found in various types of malignant tumors. Although lacking consensus, some cell surface markers, such as CD44 and CD133, have been popularly used for the identification of CSCs. These CSCs have been demonstrated to be therapeutic resistance and play critical roles in the recurrence and metastasis of cancer. By isolating CD133+ /CD44+ CSCs from parental cells, we To quantify the increase in radioresistance of stem cells, a comparison of the radiosensitivity of two generations of stem and non-stem cells has been studied.

The HCT8 human colorectal cancer cell line was used for experiments. Cells were maintained in RPMI 1640 medium (Wako, Japan) with 10% fetal bovine serum and 1% penicillin/streptomycin (Gibco, UK). Cells were cultured at 37°C in a humidified atmosphere of 5% CO₂ and 95% air. To verify the purity of the isolated CD133+ /CD44+ CSCs, cells were stained according to the supplied antibody protocols. Cells in culture dishes were exposed to 0, 1, 3, 5 and 7 Gy (137Cs source in a PS-3100SB γ -ray irradiation system; 1 Gy/min; Pony Industry Co., Ltd. Osaka, Japan). Then we received the next generation of cells after irradiation with different doses. After that cell grow up to 50% confluence and we irradiated the second cell generation. To evaluate the colony-forming ability after irradiation, we seeded cells into 6-well plates at a density of 100 cells/well. And further the number of surviving cells was calculated after 10 days by colony counting method.

According to our experiments, increased radioresistance in the second generation of irradiated HCT8 stem cells (CD44+/CD133+) was demonstrated, which is more clearly manifested in the region of large doses. On the contrary, in parental cancer cells (HCT8 lines) radiosensitivity was increased in the second generation after irradiation with various doses.

Summary

It was revealed that tumor stem cells (HCT8 lines CD44+/CD133+) acquire radio resistance in the second generation after irradiation, and non-stem cells (HCT8 lines) , on the contrary, acquire a more increased radiosensitivity in the second generation.

Author: Ms EVSTRATOVA, Ekaterina (Russia)

Co-author: Prof. LI, Tao-Sheng (Department of Stem Cell Biology, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki, Japan)

Presenter: Ms EVSTRATOVA, Ekaterina (Russia)

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