1 Effects of 7.5cGy heavy ion irradiation on tumor growth in tumor-bearing male and female mice

T. Bing (1,2), B. Dang (1), Y. Xie (1,2), X. Hu (1,2) and W. Li (1)

(1) Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, Gangsu, China, (2) Graduate School of Chinese Academy of Sciences, Beijing, China (bingtao@impcas.ac.cn / Phone: 86-931-4969336)

ABSTRACT Purpose: The data on heavy ions causing tumor is few. In the study, the effects of low dose with heavy ion radiation in tumor-bearing mice were investigated.

Methods and Materials: Six hours before the implantation of S180 sarcoma cells, the BALB/c mice groups were irradiated in whole body with 7.5cGy by the $^{12}C^{6+}$ beam (73.74MeV/u), at the HIRFL (Lanzhou, China). From the fifth day, the sizes of tumor were measured. 16 days after irradiation, spleen, thymus and tumor were sampled immediately upon sacrifice and were weighed.

Results: The S180 sarcoma sizes of the 7.5cGy irradiation group grew bigger than those of the sham-irradiation, and the sizes of male grew bigger than those of female. The spleen index of tumor-bearing mice is bigger than the normal control group in male and female mice, while thymus index of female 7.5cGy irradiation group is bigger than other groups.

Conclusions: This study indicates LDR (low dose radiation) of heavy ions can cause different biological effect to the different strain and gender animals, and LDR of heavy ion may be still hazard to some people whose immunity are low especially. If the carbon treatment volume includes normal tissues, they are also risky for the appearance of both enhanced acute and late radiation effects. The mechanisms involved remain to be elucidated. This question is of importance because this late reaction could be one of the parameters limiting the long-term space missions and object-oriented biological hadrontherapy.