FRACTIONATED HIGH LET IRON IRRADIATION EFFECTS ON K-RasG12D-INDUCED TUMOR PROGRESSION

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INTRODUCTION

The effect of space radiation upon lung tumorigenesis is unclear. While radiation alone has not led to significant tumor formation in wild-type mouse lungs, the effect of radiation on tumor progression in lungs expressing oncogenic K-Ras is unclear.

METHODS

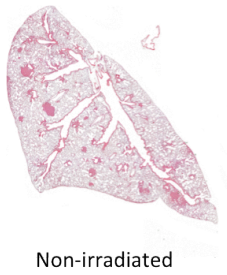
Clara Cell Secretory Protein (CCSP, CC10)-Cre-Estrogen Receptor (Cre-ER) transgenic mice were bred to lox-stop-lox K-RasG12D mice. Tamoxifen was administered to pups at 6 weeks after birth. From 4-6 weeks after this, mice were shipped to BNL and either sham radiated or radiated with 5 daily fractions of .2Gy 600 MeV/n ^{56}Fe. The mice were then shipped back to Duke and sacrificed 8 weeks after radiation. The lungs were harvested, embedded, and sectioned, and the longitudinal section of the left lobe containing the main axial bronchus was selected and stained with H&E. Image J software was used to quantify tumor area per section.

RESULTS

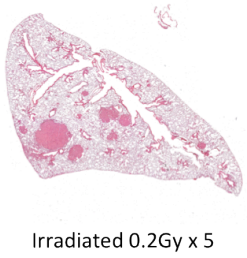
No change in the distribution or number of tumors was noted in the mice (Figure, top panels). Image J analysis of the sections demonstrates a higher tumor area in the radiated mice (15 control and 22 experimental mice examined). We expect this to become statistically significant following future BNL runs.

CONSLUSION

While high LET Fe delivered in .2 Gy 600 MeV/n ^{56}Fe over 5 daily fractions does not lead to changes in tumor distribution or tumor number, it does seem to lead to larger tumors by area. We are actively studying the mechanism of this effect.



Non-irradiated



Irradiated 0.2Gy x 5