

## AbstractID: 6840 Title: Invitro Dose and Dose Rate Feasibility Study for Effective Tomotherapy TMI Treatment

**Purpose:** We reported the successful use of Tomotherapy for the total marrow irradiation (TMI) treatment. However, Tomotherapy delivers treatment at a much higher dose rate (400-900 cGy/min) than current TBI treatment (10 - 25 cGy/min) delivered using a standard medical accelerator. Even with the more accurate dosimetry possible with Tomotherapy, the effect of high dose rates even at limited doses is unclear at best. We aim to study the effect of high dose and dose rate on cell survival.

**Method and Materials:**

A549 human lung cells, BE(2)-M17 human neuroblastoma cells and N2A mouse neuroblastoma cells were used. Cells were plated in T-25 flasks with appropriate medium. After 8 hours attachment period, each flask of cells were irradiated with a different dose: 2, 4, 6, 9 and 12 Gy. As the dose rate, 112 cGy/min was used in A549 and BE(2)-M17 cells and 400 cGy/min was used in N2A cells. Cells were cultured for 10-15 days and survived cells were making colonies. Colonies were fixed with a mixture of methanol and acetic acid (10:1 v/v) and stained with 1% crystal violet. Colonies containing more than 30 cells were scored.

**Results:**

BE(2)-M17 cells were more sensitive to radiation than A549 and N2A cells. Mean lethal dose, D<sub>0</sub>, were 89, 136 and 188 rad in BE(2)-M17, A549 and N2A cells in each. Plating efficiency at 6Gy were 0.50, 6.23 and 6.97 % in BE(2)-M17, A549 and N2A cells in each. Extrapolation number were 8.17, 5.20 and 2.51 in BE(2)-M17, A549 and N2A cells in each.

**Conclusions:**

We show that different cell lines have different dose response invitro. Currently we are continuing the survival study for dose rate from 10 cGy/min to 800 cGy/min which will be reported in the conference.