

AbstractID: 13758 Title: Synergetic Effect of Docetaxel and MR Guided Focused
Ultrasound (MRgFUS) for Prostate Cancer

Purpose: Our previous studies showed increased 3H-docetaxel concentration in prostate tumors in the MRgFUS treated group compared with the control group. The purpose of this study is to determine if MRgFUS increases the efficacy of docetaxel in inhibiting prostate tumor growth. **Method and Materials:** LNCaP cells (106) were injected into the prostate of male mice. When tumors reached the volume of 47 ± 3 mm³ on MRI, treatment was performed using an InSightec ExAblate 2000 with a 1.5 T GE MR scanner. The animals were randomly divided into 3 groups (n=5/group). For group 1, mice were treated with MRgFUS once a week for two consecutive weeks. Animals were treated with pulsed ultrasound using 1MHz; 5 W acoustic power and the 81 mode setting (5 Hz frequency with 0.1s power on, 0.1s power off) for 60 seconds for one sonication. Multiple sonications (4-6) were used to cover the whole tumor volume. Immediately after the MRgFUS treatment, docetaxel (10mg/kg) was injected by tail vein. The animal was allowed to survive for 4 weeks after the last treatment. The tumor growth was monitored on MRI. Animals in Group 2 were treated with Docetaxel injection only. Animals in group 3 were used as control. **Results:** The relative tumor volume in MRgFUS + Docetaxel treated group was 0.788 ± 0.07 and 0.75 ± 0.11 1 week and 4 weeks after the last MRgFUS treatment, respectively, while for the group received only Docetaxel it was 0.908 ± 0.23 and 1.48 ± 0.54 1 at week and 4 weeks, respectively. Both groups showed smaller tumor volumes compared to the control group. **Conclusions:** MRgFUS has a potential to increase the efficacy of docetaxel in inhibiting prostate cancer growth. More experiments are under way for optimal ultrasound treatment parameters to improve the synergetic effect.