Background: High intensity focused ultrasound (HIFU) produces immediate focal lesions in tissue. We have shown that HIFU can be used to create a murine myocardial failure model.

Methods: We studied 20 wild type mice (HIFU group). They were anesthetized and underwent a chest incision. A 10mm x 10mm size HIFU transducer was placed on the left ventricular anterior wall using gel and water bath. The focal point was set at the middle of LV wall. We used one second duration pulse to deliver ten 0.4 second duration pulses over a 10 second period. Four lesions were created in different septal areas by moving the transducer. All specimens were fixed in buffered formalin and analyzed histopathologically.

Results: The mortality of HIFU group was 25%. There was no significant difference of LV systolic dysfunction between the two groups. After 7 days of HIFU ablation, there was no significant difference of LVEF between the two groups. LVEF in the control group did not change. However, LVEF in the HIFU group was significantly reduced after HIFU ablation (69.7±5.3% vs 48.4±13.7%, respectively; p<0.01). Histopathological study showed a necrotic area around the ablation site and LV remodeling.

Conclusion: HIFU can produce LV dilatation and systolic dysfunction in mice. HIFU may be used to create a murine myocardial failure model.