

Abstract Submitted  
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**Ultrasonic Detection of Microscopic Breast Cancer in Cell Cultures**<sup>1</sup> JEFFREY B. GOODRICH, HEMANG PATEL, TIMOTHY E. DOYLE, SOONJO KWON, Utah State University — A current problem in breast cancer treatment is the detection of microscopic cancer in surgical margins to ensure all of the cancer has been removed. Current methods rely on extensive pathology work that may take several days to complete. Positive findings for cancer in margins require follow-up surgery for up to 50% of lumpectomy patients to remove more tissue. A microscopic detection method for use during surgery would be preferable to reduce the risks, costs, and patient suffering of follow-up operations. Ultrasound is a promising *in vivo* detection method due to its low cost, portability, and ability to detect malignant tissue changes. Recent experiments have demonstrated the ultrasonic detection of microscopic cancer in cell cultures. Ultrasonic waveforms from pulse echo measurements showed significant differences between normal and malignant cell monolayers. The ultrasound also detected normal and malignant monolayer growth that displayed good correlations with cell counts. These results support the use of ultrasound as a viable method for *in vivo* detection. Testing of surgical samples at the Huntsman Cancer Institute is now in progress.

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