

# IEEE TRANSACTIONS ON ULTRASONICS, FERROELECTRICS, AND FREQUENCY CONTROL

A PUBLICATION OF THE IEEE ULTRASONICS, FERROELECTRICS, AND FREQUENCY CONTROL SOCIETY



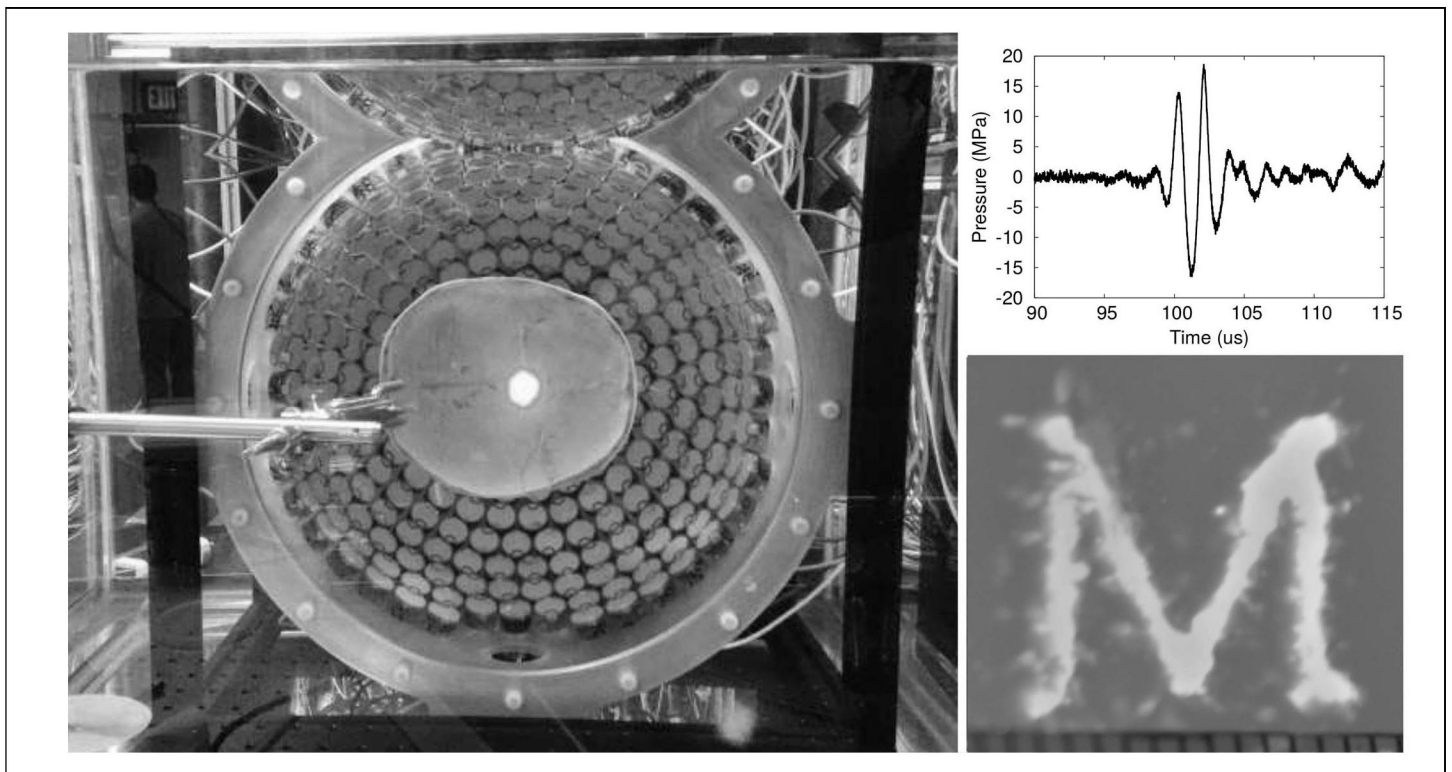
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**Targeted Lesion Generation Through the Skull Without Aberration Correction Using Histotripsy**

The image on the left shows a 500-kHz, 256-element hemispherical histotripsy transducer used to deliver histotripsy treatments through an excised human skullcap mounted within it. This transducer is capable of generating targeted bubble clouds and lesions through the skullcap without using aberration correction. The green spot in the center of the skullcap is a laser light reflected off the interior surface of the skullcap to backlight images of bubble clouds and lesions generated in red blood-cell phantoms during experiments. The image in the top right shows a pressure waveform measured through the skullcap at the geometric origin of the transducer without applying aberration correction to correct for phase aberrations introduced to the histotripsy pulses as they traveled through the skullcap. The image on the bottom right shows a block “M” patterned lesion generated in a red blood-cell phantom using histotripsy through the skullcap without aberration correction. The lesion was generated by mechanically repositioning the skullcap/red blood-cell phantom pair within the histotripsy transducer to trace out the pattern.

Images are courtesy of Jonathan R. Sukovich, Zhen Xu, Yohan Kim, Hui Cao, Thai-Son Nguyen, Aditya S. Pandey, Timothy L. Hall, and Charles A. Cain. J. R. Sukovich, Y. Kim, H. Cao, T.-S. Nguyen, T. L. Hall, and C. A. Cain are with the Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI 48109 USA. Z. Xu is with the Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI 48109 USA and also with the Department of Pediatrics, University of Michigan, Ann Arbor, MI 48109 USA. A. S. Pandey is with the Department of Neurosurgery, University of Michigan, Ann Arbor, MI 48109 USA.

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