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**Ultrasound-Enhanced Latex Immunoassay of Pathogens in Water**

Danny Bavli<sup>a</sup>, Yechezkel Barenholz<sup>a</sup>, Noam Emanuel<sup>a</sup>, Victor Ponomarev<sup>b</sup> and Aba Priev<sup>a</sup>

<sup>a</sup>Hebrew University, Hadassah Medical School, Ein Kerem, 91120 Jerusalem, Israel

<sup>b</sup>NDT Instruments Ltd, HaGomeh 16/4, 98537 Maale Adumim, Israel

Real-time knowledge of contaminants in water is an essential component of any potable water security system. Latex Immunoassay is the basic technique in rapid identification of pathogens. We used acoustic radiation to accelerate the latex immunoassay and to bring about separation between free and bound antigen (rotavirus SA-11) in less than one minute. The ultrasonic cylindrical standing-wave device of NDT Instruments, UltraAssay 101, creates areas of maximum and minimum potential energy (nodes). Acoustic radiation forces acting on the pathogens drive them directly to the central node. In this manner, antibody-antigen complexes accumulate in the nodes in 40-60 sec. The non-bound antibodies are washed out of the separation area by the buffer flow. The forces responsible for separation of particles in the UltraAssay 101 depend on the frequency of the standing-wave resonator and on the density, compressibility and size of the immune complexes. Additionally, UltraAssay 101 is able to directly monitor water salinity, turbidity and specific gravity.