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## A centrifugal based nucleic acid test with the immiscible filtration technique

Chih Hsin Shih

Feng Chia University, Taiwan

A nucleic acid test (NAT) is a technique used to detect a nucleic acid, virus, or bacteria. In recent years, it has been applied to many applications such as clinical diagnoses, species identification, and food safety. However, in the conventional testing operation, the testing procedure for NAT is usually labor-intensive and time-consuming. It also required well-trained technician and the transfer of testing sample could result in nucleic acid contamination. Therefore, a user-friendly and automated assay process to conduct NAT is of great importance. The major assay process for the NAT includes extraction, amplification, and detection. In the past few years, many microfluidic functions were developed for sample preparation and process automation. Kido et al. developed a cell-lysing approach by grinding the cell with beads. To control the movement of magnetic

beads, Strohmeier et al. developed a Gas-phase transition magnetophoretic to transfer the magnetic beads through the liquid/air interface. To purify the nucleic acid, Berry et al. proposed an immiscible filtration assisted by surface tension technique. In this work, an integrated and automated nucleic acid testing platform was developed using the centrifugal microfluidics. The microfluidic disk can lyse the cells, purified the nucleic acid through immiscible phases, and eluted the nucleic acid from the complex into the elution buffer. The eluted buffer can be used for amplification and quantification. A magnetic module was developed to transfer magnetic beads in the above-mentioned processes. This work provides an automated and user-friendly solution for the nucleic acid testing.

### Biography

Chih Hsin Shih has completed his PhD from the Ohio State University. He is the associate professor in the department of chemical engineering, Feng Chia University, Taiwan.

chshih@fcu.edu.tw