

Supplementary Movie 1 Phaseguide controlled filling of the chip with gel (blue) and sample (red). After gel cross-linking, two sample chambers are created that can be filled with buffer and sample. Also shown is a phaseguide-controlled complete recovery. Frame 1, 3 and 5 are real-time. Frame 2, 4, and 6 and accelerated to double velocity.

Supplementary Movie 2 Electrophoretic transport of negatively charged Xylene Cyanol through a polyacrylamide gel. Also shown is the growing and subsequent expulsion of hydrogen gas from the electrophoresis cathode. Although not all gas is expelled from the chip, more than an hour of electric actuation at 40 μA can be achieved. The first frame is accelerated 64 times, the second 16 times and the third 64 times.

Table 1 Various probe/primer sets. The amplicon lengths were 65 nt for the *E. coli* tmRNA system and 68 nt for the *S. thermophilus* tmRNA system.