Electronic Supplementary Information

Hand-held syringe as a portable plastic pump for on-chip continuous-flow PCR: Miniaturization of sample injection device

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Evaluation of sample residence time as functions of total tube length and initial internal pressure

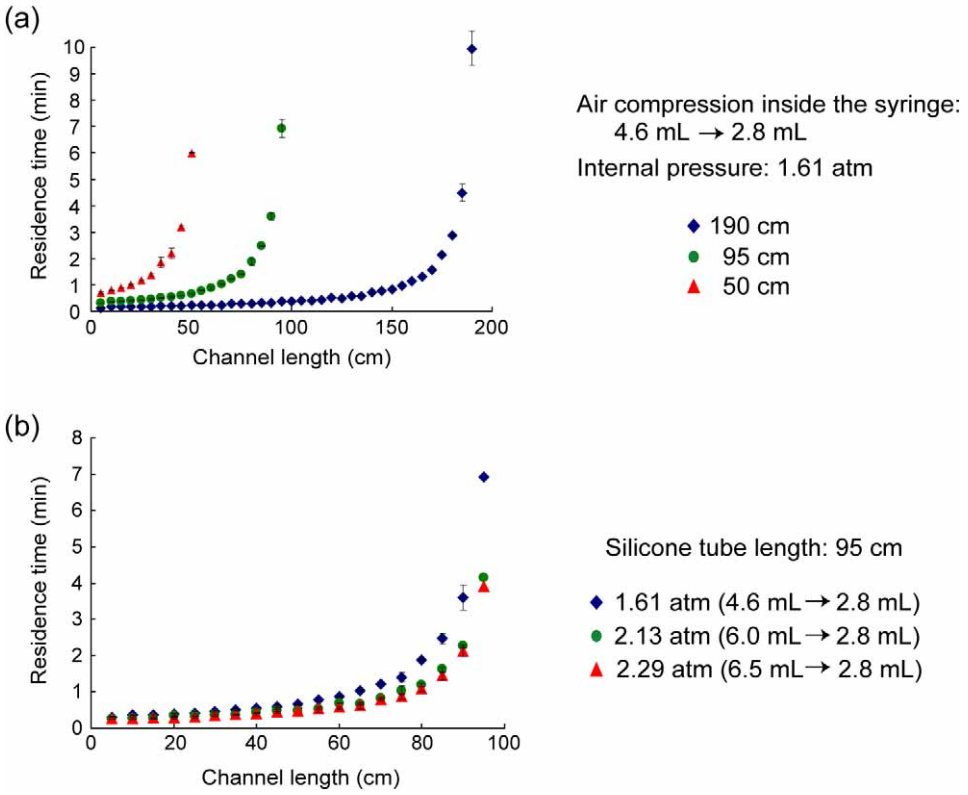

Fig. S1. (a) Variation of sample residence time as a function of total tube length when 50, 95, and 190 cm-long silicone tubes were employed. The initial internal pressures were fixed to 1.61 atm. (b) Variation of sample residence time as a function of initial internal pressure when the initial internal pressures were 1.61, 2.13, and 2.29 atm. The tube lengths were fixed to 95 cm.

Evaluation of air diffusion phenomenon inside a gas-permeable silicone tube

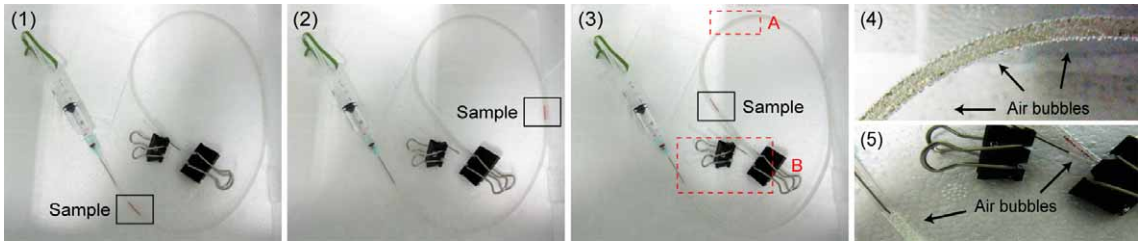

Fig. S2. Series of images showing air diffusion phenomenon taking place across the walls of a gas-permeable silicone tube simultaneously with the flow of a red ink plug. (1) ~ (3) shows time-dependent movement of a red ink plug inside a silicone tube. (4) ~ (5) shows enlarged images of regions "A" and "B" in (3). As shown in (4) and (5), air diffused out of the walls of the silicone tube throughout the entire length of the tube, confirmed by the air bubble formation.

Movies showing air diffusion phenomena inside a gas-permeable silicone tube and PDMS microdevice

Fast-mode movie clips demonstrating the ink plug movement inside a silicone tube as well as inside the PDMS microdevice, connected with silicone tubes, are shown in Movies S1 and S2.