

Continuous-flow PCR on PDMS-glass microchip

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Polymerase chain reaction (PCR) is a very powerful technique used for the amplification of DNA molecules *in vitro*. Recently, there has been an increasing interest in developing miniaturized PCR chip. The microfabricated PCR chips have the advantages of small sample volume, rapid thermal cycling and low cost. We aimed at developing micro continuous-flow PCR chip (μ -PCR chip) using PDMS and glass. The μ -PCR chip was fabricated on PDMS using soft lithography and was bonded irreversibly on glass. In order to perform μ -PCR, we constructed a thermal cycling system which consists of thermoelectric element (TE) heating module, Pt100 sensors, and temperature controllers. PCR reaction mixture is delivered onto the chip by precision syringe pump. Continuous-flow PCR was done by transferring reaction mixture through a microfluidic channel which repetitively passes through the three different temperature zones. While conventional PCR machines takes 90~150 min for 30 cycles to obtain the detectable amount of PCR product in slab gel separation, our μ -PCR chip system took 10~30 min to complete the 30 cycles.