

PTFE Capillary-Based DNA Amplification within an Oscillatory Thermal Cycling Device

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Abstract : This study describes a capillary-based device integrated with the heating and cooling modules for polymerase chain reaction (PCR). The device consists of the reaction polytetrafluoroethylene (PTFE) capillary, the aluminum blocks, and is equipped with two cartridge heaters, a thermoelectric (TE) cooler, a fan, and some thermocouples for temperature control. The cartridge heaters are placed into the heating blocks and maintained at two different temperatures to achieve the denaturation and the extension step. Some thermocouples inserted into the capillary are used to obtain the transient temperature profiles of the reaction sample during thermal cycles. A 483-bp DNA template is amplified successfully in the designed system and the traditional thermal cycler. This work should be interesting to persons involved in the high-temperature based reactions and genomics or cell analysis.

Keywords : polymerase chain reaction, thermal cycles, capillary, TE cooler

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