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MICROFLUIDIC CHIP FOR EXTREME PCR

DIAGNOSTICS

Thermal gradient plug flow microfluidic chip that enables extreme PCR.

TECHNOLOGY TYPE

Instrumentation
Microfluidics

STAGE OF DEVELOPMENT

- Proof of concept established. Demonstrates the device is capable of amplifying NQ01 consistently.
- On-going work to:
 - Determine the device's ability to amplify other targets.
 - Integrate HRMA and qPCR capabilities into the device.

IP PROTECTION

U.S. Utility Patent Pending

Thermal Gradient Plug Flow
Microfluidic Devices for
Extreme PCR
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TECHNOLOGY SUMMARY

Polymerase chain reaction (PCR) is an inexpensive and robust technique for amplifying specific segments of DNA for gene analysis, DNA sequencing, DNA profiling, and diagnostic tests. The speed at which PCR can be performed depends on the time required to cycle through temperature dependent steps.

The *microfluidic chip for extreme PCR* allows for a 1 to 2 second PCR cycle. The chip has one uniform channel through which a PCR mix flows, with a single port acting as both an inlet and outlet. A thermal gradient is introduced across the chip, where one end is at the melting temperature of a target and the other is at the annealing temperature of DNA. The target is amplified after two cycles through the chip and identified on a high resolution melting instrument in roughly one minute. This chip facilitates extreme PCR that is cheap, easy to manufacture, and simple to use.

FEATURES AND BENEFITS

- Performs 40 cycles in 60 seconds, which is faster than any commercial thermal cycler.
- Enables PCR on a microfluidic chip.
- Provides sharp, distinct peaks on a high resolution melting instrument.

RECENT PUBLICATIONS

Jafek, A.R., Brady, S., Harbertson, S., Millington, A., Samuel, R., Gale, B.K. (2017). Quantifying microfluidic PCR at extreme speeds. *Proc. Of MicroTAS 2017 Conference*. 2017: 1229 – 1230.

INVENTOR PROFILE

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