



THE BUSINESS PARTNER  
FOR YOUR IDEAS



## TWO-ZONE FLOW-THROUGH PCR USING THIN FILMS

### DIAGNOSTICS

Multi-layer microfluidic card with a simple and portable thermal cycler for performing polymerase chain reactions (PCR) at extreme speeds.

### TECHNOLOGY TYPE

Instrumentation  
Microfluidics  
PCR

### STAGE OF DEVELOPMENT

- PCR successfully demonstrated.
- Ongoing testing to optimize chip design.
- Additional research required to reduce the instrumentation to practice.

### IP PROTECTION

#### PCT Pending.

Micro-Fluidic Device for  
Rapid PCR

### LEARN MORE

Reference Number: U-6326

#### Aaron Duffy

Technology Manager  
aaron.duffy@tvc.utah.edu  
801-585-1377

### TECHNOLOGY SUMMARY

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. A novel PCR machine that combines a microfluidic card and simple thermal cycler performs PCR at extreme speeds by reducing cycling time to less than a second. Copper blocks surround the microfluidic consumable card to improve heat transfer and temperature control. This interaction reduces overall PCR time by enabling temperature equilibration in under 0.3 seconds. The device is more affordable than existing solutions and portable, facilitating use in point-of-care settings.

### FEATURES AND BENEFITS

- Reduces cycle time to less than one second compared to the industry standard of almost five minutes.
- Facilitates rapid PCR testing in point-of-care settings.
- Provides robust heat transfer for faster cycling and improved temperature control.
- Enables zone equilibration in under 0.3 seconds.

### RECENT PUBLICATIONS

Trauba, J.M., Wittwer, C.T. (2017). Microfluidic extreme PCR: <1 minute DNA amplification in a thin film disposable. *Journal of Biomedical Science and Engineering*. 10(05): 219-231. doi:10.4236/jbise.2017.105017

### INVENTOR PROFILE

**James M. Trauba**, [Research Engineer - Pathology](#)

DATE UPDATED: 6/8/2018