Supplemental Data

Warfarin Genotyping with Hybridization-induced Aggregation on a Poly(ethylene terephthalate) Microdevice

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**Supplemental Table 1. Oligonucleotide sequences.** Lowercase letters in primer sequences indicate intentional mismatches versus the genomic template. Primer sequences for *2, *3, and 1173C>T products are described by Poe et al (28).
Supplemental Table 2. Genotyping results of 23 patient samples. All HIA results are reported in terms of saturation value. Using the threshold saturation value (310,000), genotypes were assigned as wild-type (WT; saturation<310,000) or mutant (MUT; saturation>310,000). The genotyping results as determined by the conventional test (WARFGENO, ARUP laboratories) are also reported. Mutant genotypes reported by the conventional test are distinguished as heterozygous (het) or homozygous (homo).
Supplemental Methods and Materials

Instrumentation for microdevice PCR

Custom built instrumentation comprising a pair of Peltier thermoelectric cooling modules (Laird Part 430446-503) clamped around the PCR reservoir was used for temperature cycling. Temperatures were measured with a T-type thermocouple and digitized before being sent to a Parallax Propeller microcontroller (Parallax Part 32150). These signals provided feedback so that temperatures inside the PCR chamber could be regulated with a Proportion-Integral control algorithm run on the microcontroller. Peltier throttle control signals were generated by the microcontroller, converted to an analog signal with a digital to analog converter (Analog devices AD557), and amplified by a high current operational amplifier (Texas Instruments Part OPA548), before reaching the Peltier modules. User inputs related to thermocycling temperatures and duration were sent to the microcontroller via a text-based serial terminal interface.

HIA instrumentation

Motion profiles were created using a bipolar stepper motor (Sanmotion Type SS2422-5041). Rotation speeds were controlled in an open loop fashion by changing the frequency of step pulses sent to the motor. These pulses, produced by a Parallax Propeller microcontroller (Parallax Part 32150), were decoded and amplified by a Texas Instruments DRV8825 IC based microstepping breakout board (Pololu Part 2133) in full step mode, creating a step size of 1.8 degrees. User inputs concerning spin speeds and times were communicated to the microcontroller by a text-based serial terminal interface designed in house.
Microdevice fabrication

Microdevices used for HIA assays and chip PCR were fabricated with a poly(ethylene terephthalate) substrate in the form of overhead transparency sheets (TRANSNS; Filmsource, Maryland Heights, MO). Each device was composed of 5 layers. Layers 2 and 4 of the device were coated with toner (HPC-4127X black; Hewlett-Packard, Palo Alto, CA) by printing two layers of the toner on each side of the transparency at 600dpi, using a HPLaserJet 4000 printer (Hewlett-Packard, Palo Alto, CA). Layers 1 and 5 were treated with plasma oxidation (PE-75; Plasma Etch, Carson City, NV). The features of each layer of the microdevice were designed using CorelDraw software and cut from transparency sheets using a CO₂ laser cutter (VersaLASER VLS3.50; Universal Laser Systems, Scottsdale, AZ). The device was bonded using an office laminator (UltraLam 250B; Akiles, Mira Loma, CA), allowing the printer toner to serve as an adhesive agent. The layers were initially taped together to maintain alignment and subsequently inserted into the laminator several times to ensure sufficient bonding.