

## HDA-GT12 System for Identification of *Plasmodium* species

### Introduction:

Malaria is one of the world's main health problems. There are four *Plasmodium* species that cause human infection. Using specific primers enables the identification and characterization of the four *Plasmodium* species. The first PCR step involved an amplification of a nucleotide sequence conserved throughout the *Plasmodium* genera. The first round PCR fragment obtained was used as a substrate for a species-specific amplification. The presence of each *Plasmodium* species is easily distinguished by the size difference of the amplification products.

BioCal provides a cost-effective multi-channel capillary electrophoresis system for automatic, fast and high-resolution *Plasmodium* species detection. A consumable multi-channel capillary gel cartridge used with the system can automatically inject and analyze 12 strip samples simultaneously in less than 10 minutes or a 96-well plate in 1.3 hour. This affordable system can be operated easily in laboratories for malaria diagnosis and treatment.

### Methods:

BIOMALAR TWO STEP STD DETECTION kits from BIOTOOLS B&M labs, SA (Madrid, Spain) were used in this study. Four species of *Plasmodium* control DNA were used for PCR\* amplification and were analyzed in the HDA-GT12 system.

### Operation Procedure:

1. Insert BioCal's gel cartridge into the system (cartridge capacity: 1200 samples) (45 seconds).
2. Place amplified DNA solution directly (20 µl) in 0.2 ml

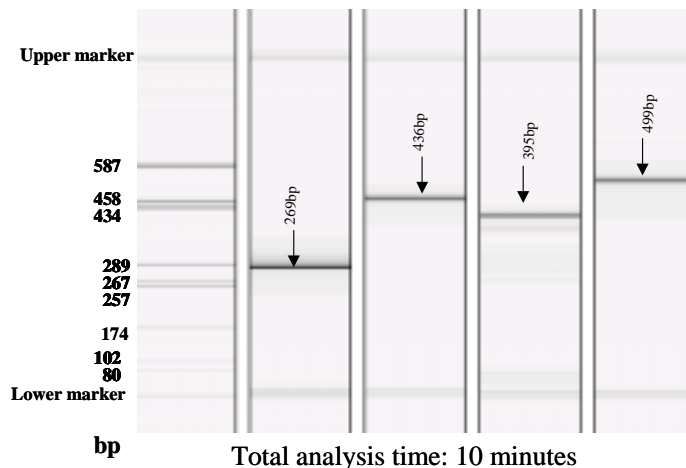
tube strips (or plates) into the sample tray (30 seconds).

3. Select a method from BioCalculator software and click "run" button to run samples (45 seconds).
4. Separate and detect the DNA fragments (500s seconds at 5kV).

\*The PCR process is covered by patents owned by Hoffmann-LaRoche.

### Results:

1. A 269bp was detected for *P. malariae*, a 436bp was detected for *P. ovale*, a 395bp was detected for *P. falciparum* and a 499bp was detected for *P. vivax*.
2. A DNA size marker was used to determine the size of PCR products.



### HDA-GT12 System Features:

- Automated process: no need for manual sample loading.
- Replaceable gel cartridge: no need for gel preparation.
- 10-minute electrophoresis time.
- Detection : 0.1 ng/ ul DNA concentration in the solution.
- Resolution: 1-5 bp in DNA fragment sizes between 50-500 bp.
- 96-sample capacity.
- Data view: in electropherogram or gel-view format.
- Software: digital data for analyses.
- Compact design: fits on any lab bench.
- Competitive system cost and economical consumables.
- HDA-GT12 system is for research use only.