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# Diagnostic Kit for Plasmodium Falciparum (PF) DNA

**Product Number: DTL0642**

## Shipping and Storage

1. Store below 30°C. It is valid for 12 months.
2. Transport at normal temperature, not suggested over 14 days.
3. Opened but not completely used the all components should be stored at (-20±5)°C. It is recommended to separate in PCR tubes before refrigeration to avoid repeated freezing and thawing of all reagents next time. It is not recommended to repeat the freeze-thaw cycle more than 7 times.
4. Date of manufacture and term of validity: see the label.

## Component

| Component | 48T |
|---|---|
| B19 PCR Master Mix | Lyophilized powder ×1 Bottle |
| Positive Control | 100μL |
| Negative Control | 1mL |
| Redissolved Diluent | 1.5mL |

1. Do not mix reagents from different batches.
2. The reaction system is lyophilized powder that contains all components required for fluorescence PCR, including Taq enzyme, reverse transcriptase, primers, probes, dNTPs, and $Mg^{2+}$.

## Description

This kit uses TaqMan probe real-time fluorescence PCR technology to design a pair of Plasmodium falciparum-specific primers, combined with a specific probe, and uses fluorescence PCR technology to perform in vitro amplification and detection of Plasmodium falciparum nucleic acid, which is used for clinical etiological diagnosis of suspected infectious materials. The kit is provided with an Internal Control, which can monitor whether there is PCR inhibitor in the sample to be tested by detecting whether the internal control is normal or not, so as to avoid false negative PCR.

## Application

This kit is suitable for detecting Plasmodium falciparum in whole blood and other samples, and is used for the auxiliary diagnosis of Plasmodium falciparum infection.

## Applicable instruments

Real-time fluorescence PCR instrument with FAM channel and VIC channel.

## Specimen collection

1. Applicable sample type: Blood sample.
2. Sample collection: Blood samples: Use a syringe to collect 2mL of the patient's blood into an EDTA-2Na anticoagulation tube. Take 50μL of blood cells from the lower layer of anticoagulated blood, add 100μL of double distilled water and blow evenly.
3. Sample storage and transportation: The collection or processing sample should not exceed 24 hours under the conditions of 2°C ~ 8°C. If long-term preservation is needed, it should be stored below -70°C, and the freezing fusion should not exceed 3 times.

## Protocol

1. **Reagent preparation:**

Take out the Pf PCR Master Mix, open each bottle cap according to the arrow direction of the aluminum-plastic cover, add

960μL of Redissolved Diluent, strongly mixed on the vortex for more than 1 minute, then stand for 30 ~ 60 seconds until the liquid is clear and transparent. Subpackage it into PCR reaction tubes according to 20μL/ tube.

**2. Nucleic acid extraction:**

This kit is not included for Nucleic Acid(NA) extraction reagent.

Commercially available extraction kits that have been shown to generate highly purified DNA when following manufacturer's recommended procedures for sample extraction are applicable.

If the extracted DNA is not used immediately, it should be stored below -20℃. For long-term storage, it should be stored below -80℃ and avoid repeated freezing and thawing.

Note: The Negative Control and the Positive Control does not require nucleic acid extraction. The Positive Control needs to be redissolved with 100μL of redissolved diluent and mixed well before use.

**3. Add sample:**

The correspond substances were added to that above PCR reaction tubes according to the following table:

| Type | Add sample description |
|---|---|
| Testing Sample | Add 5μL of the extract prepared in step 2 to the reaction tube, and close the tube cover. |
| Negative Control/ Positive Control | Add 5μL of negative control and positive control to the reaction tube, and cover the tube tightly. |

The total reaction volume is 25μL.

After adding the sample, the PCR reaction tubes should be mixed well and centrifuged for 5s on a palm centrifuge and then delivery to the nucleic acid amplification region. If bubbles are found, the tube wall should be gently flicked to remove bubbles and centrifuged again.

**4. PCR amplification:**

Place the reaction tube in the automatic fluorescent PCR instrument, set the negative control, positive control, and test sample parameters to perform PCR experiment according to the operating instructions of the instrument, and record the corresponding sample name.

Select FAM channel to detect Plasmodium falciparum DNA, select VIC channel to detect the Internal Control. Set the Reaction Volume per Well to 25μL.

(Note: For ABI series instruments, select 'None' under 'Quencher', and select 'None' as the dye to use as the passive reference.)

Recommended reaction program setting:

| Step | Cycles | Temperature | Time | Collect fluorescence signal |
|---|---|---|---|---|
| 1 | 1 cycle | 95℃ | 2min | No |
| 2 | 45 cycles | 95℃ | 15sec | No |
| | | 60℃ | 30sec | Yes |

**5. Result analysis:**

After the reaction is completed, the results are automatically saved.

The Start value, End value and Threshold value of the Baseline should be adjusted according to the analyzed image (the user can adjust it according to the actual situation, the Start value can be set at 3~15, the End value can be set at 5~20, the amplification curve of the negative control should be adjusted to be flat or below the threshold line).

Click Analyze for analysis, make the parameters meet the requirements in the following '6.Quality control', and then go to the Plate window to record the Ct value.

**6. Quality control**

Negative control: FAM and VIC detection channels have no amplification curves.

Positive control: FAM and VIC detection channels have obvious amplification curves, and the Ct value of each channel ≤32.00.

The above requirements must be met at the same time in the same experiment; otherwise this experiment is invalid and needs to be repeated.

## Explanation of Test Result

1. Positive:Ct value ≤40.00 and the curve has a clear index growth curve,IC not required.
2. Negative:Ct value >40.00 or no Ct value, IC Ct value ≤40.00.
3. If the FAM channel amplification curve of the test sample has no logarithmic growth phase and the VIC channel Ct value is >40.00, the test result of the sample is invalid and the cause should be found and eliminated. Collect samples again and repeat the experiment.

## Limitation

1. Sample detection results are related to sample collection, processing, transportation and preservation quality.
2. If cross-contamination is not controlled during the sample extraction process, false positive results will occur.
3. Positive control and leakage of amplification products can lead to false positive results.
4. The genetic mutations and reorganizations during epidemics can lead to false negative results.
5. Different extraction methods have differences in extraction efficiency, which will lead to false negative results.
6. Reagent transportation, improper preservation, or inaccurate reagent preparation reagent detection performance decreases, and the results of false negative or quantitative detection occur.
7. The results of this test are for reference only. If the diagnosis must be confirmed, please combine clinical symptoms and other test methods.

## Performance Parameters

1. Minimum detection limit: The minimum detection limit of this reagent is 500 copies/mL.
2. Precision: The coefficient of variation (CV, %) of the Ct value of the pathogen detection channel is ≤5.00%.
3. Compliance rate of negative/positive reference products: The compliance rate of negative reference products in enterprise reference is 100%, and the compliance rate of positive reference products is 100%.

## Note

1. Please read the instructions of this kit carefully before the experiment, and strictly follow the operation steps.
2. Before the test, please be familiar with and master the operation method and precautions of various instruments to be used, and carry out quality control for each experiment.
3. The reaction solution should be stored away from light.
4. Try to avoid bubbles in the reaction, and the tube cover needs to be tight.
5. Use disposable heads, disposable gloves and special work clothes in each district.
6. Sample processing, reagent preparation, and samples need to be performed in different areas to avoid cross -pollution.
7. After the experiment is completed, use 10% hypochloride or 75% alcohol or ultraviolet light to treat the workbench and pipette.
8. All items in the kit should be treated as pollutants and processed in accordance with the "Biological Safety General of Microbiological Biomedical Laboratory".