

MTHFR 677 REAL TIME PCR KIT

Cat. No: 106R-10-01

PRODUCT DESCRIPTION

Methylenetetrahydrofolate reductase (MTHFR) is enzyme that play roles in homocysteine metabolism. Deficiency of the enzyme activity results in hyperhomocysteinemia and homocystinuria. Observations indicate that increased plasma homocysteine levels caused by the MTHFR 677CT (from cytosine to thymine) were associated with a thrombosis predisposition.

PRINCIPLE OF THE SYSTEM

During the PCR reaction, the DNA polymerase cleaves the probe at the 5' end and separates the reporter dye from the quencher dye only when the probe hybridizes perfectly to the target DNA. This cleavage results in the fluorescent signal which is monitored by Real-Time PCR detection system. An increase in the fluorescent signal (CT) is proportional to the amount of the specific PCR product.

PRODUCT SPECIFICATION

Each isolated DNA should be tested with wild type and mutant real time PCR mastermixes. The kit provides reagents in a ready-to-use mastermix format which has been specifically adapted for 5' nuclease PCR using patented SNP analyses. The test system is designed for use with sequence specific primers and probe.

The fluorescence of mutation analysis is FAM. Also each mastermix contains an internal control labelled with HEX/JOE dye.

The limit of detection (LOD) for the MTHFR 677 Real Time PCR Kit was determined as $\leq 1\%$.

SYSTEM CONTENTS

Reagents	20 rxns	50rxns
• MTHFR 677 Wild type PCR mastermix	400 μ l	1000 μ l
• MTHFR 677 Mutant PCR mastermix	400 μ l	1000 μ l
• Control DNA	30 μ l	60 μ l

STORAGE

- All reagents should be stored at -20°C and dark.
- All reagents can be used until the expiration date on the box label.
- Repeated thawing and freezing ($>3\text{X}$) should be avoided, as this may reduce the sensitivity of the assay.

DNA EXTRACTION

Blood samples should be collected in appropriate sterile EDTA tubes and can be stored at $+4^{\circ}\text{C}$ up to one month. For more than one month specimen should be stored at -20°C . It is advised to gently mix the tube (with EDTA) after collection of blood to avoid coagulation.

Our system optimized according to MN NucleoSpin[®] Blood. It is advised to elute DNA with **150 μ l elution buffer** for better results.

PROCEDURE

- Different wild- type and mutant tubes should be prepared.
- Before starting work, mix the mastermixes gently by pipetting
- For each sample, pipet **20 μ l mastermix*** with micropipets of sterile filter tips to each optical white strips or tubes.
- Add **5 μ l DNA** into each tube.
- Run with the programme shown below.

**Master mixes include HotStart Taq DNA Polymerase.*

PCR PROGRAMME

95 $^{\circ}\text{C}$	3 Min.	Holding
95 $^{\circ}\text{C}$	15 Sec.	30 Cycles
60 $^{\circ}\text{C}$	1 Min.	

Fluorescent dyes are FAM and HEX/JOE.

If you use:

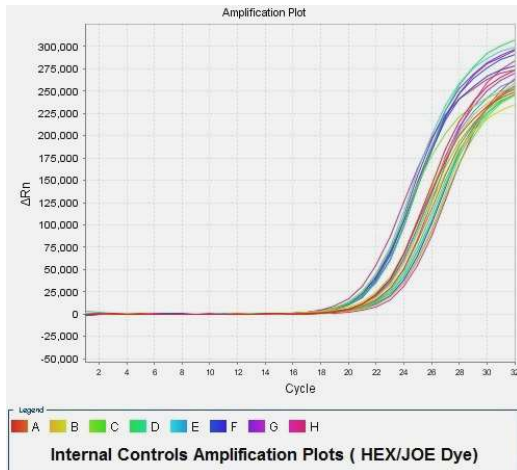
- ABI Prism[®] system, please choose "**none**" as passive reference and quencher.
- Mic qPCR Cycler, please adjust gain settings, "**Green Auto Gain**" to **20** and "**Yellow Auto Gain**" to **10**.

This system can use with:

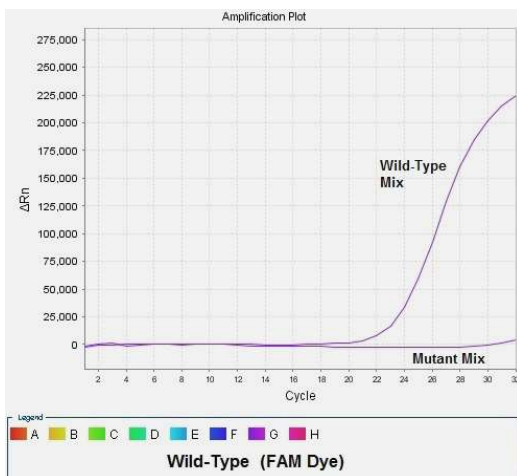
Bio-Rad CFX96
ABI Prism[®] 7500/7500 Fast
Roche LightCycler[®] 480 System
Rotor Gene Q
Mic qPCR Cycler

DATA ANALYSIS

After the run is completed data are analysed using the software with HEX (JOE) and FAM dyes. The below results were studied with ABI7500.

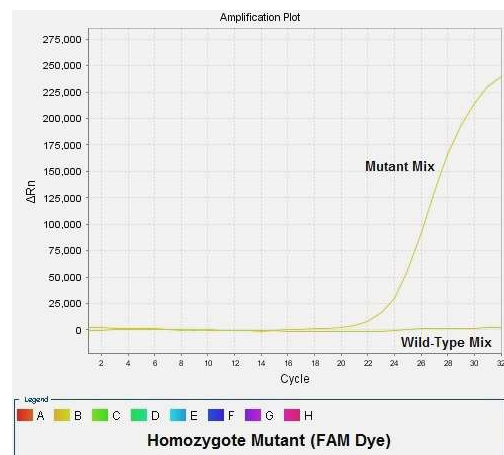
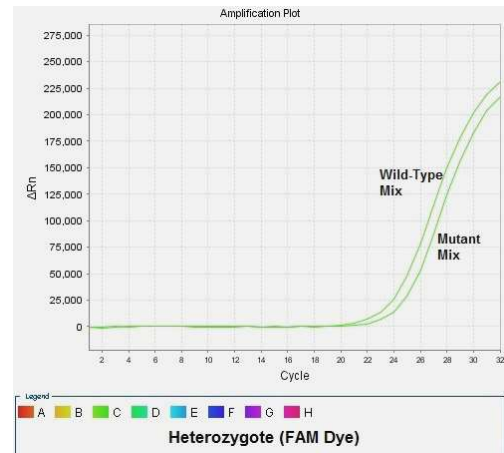


Internal control amplification plots must be seen in all wells except NTC and has been labelled with HEX (JOE) dye. The CT value of internal controls should be $22 \leq X \leq 26$.



Amplification plots of mutations can be analysed by FAM dye. The CT value should be between $21 \leq CT \leq 26$. These values are optimised according to the SNPure® Blood DNA Isolation Kit and MN NucleoSpin® Blood DNA Isolation Kit. CT values may vary $\pm 2/3$ cycle according to the DNA isolation protocol.

- Homozygote wild-type sample gives amplification signal only with wild-type mastermix.
- Heterozygote sample gives amplification signal both with wild-type and mutant mastermixes.
- Homozygote mutant sample gives amplification signal only with mutant mastermix.
- The difference of the CT value wild-type and mutant amplification plots should be ≤ 3 for heterozygote mutant sample. It is $4 \leq CT \leq 6$, test should be repeated.



TROUBLE SHOOTING

If internal control doesn't work,

- Absence of DNA
- Sample is containing DNA inhibitor(s)

If plots start late,

Compare positive control and sample. If there is no problem in positive control,

- DNA quality is not good.
- The amount of DNA is not enough.

Please contact us for your questions. tech@snp.com.tr

CAUTIONS

- All reagents should be stored at suitable conditions.
- Do not use the PCR mastermixes forgotten at room temperature.
- Thaw PCR mastermix at room temperature and slowly mix by inverting before use.
- Shelf-life of PCR mastermix is 12 months. Please check the manufacturing data before use.
- Only use in vitro diagnostics.