

HELINI

Beta thalassemia

Real-time PCR Kit

IVS1.1 G>A	IVS2.1 G>A	IVS1.110 G>A	IVSI-5 (G to C)
IVS1.6 T>C	Codon 8/9(+G)	Codon 41/42 (-TCCT)	

Instructions for use

For use with: Agilent, Bio-Rad, Roche Lightcycler-96, Roche-Z480/Cobas-480, Applied Bio systems [ABI], Thermo-Piko-Real, Rotor gene 5/6plex, Alta-96, Cepheid Real time PCR machines.





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HELINI Biomolecules, Chennai, INDIA

Intended Use

The HELINI Beta Thalassemia Real-time PCR Kit is an in vitro nucleic acid amplification kit for the detection of 7 somatic mutations in human beta globin gene associated with genetic risk.

Kit components

Components	Volume Per reaction	No of vials
Probe PCR Master Mix	10µl	14
IVS1 Wild PP Mix	5µl	1
IVS1 Mutant PP Mix	5µl	1
IVS2 Wild PP Mix	5µl	1
IVS2 Mutant PP Mix	5µl	1
IVS5 Wild PP Mix	5µl	1
IVS5 Mutant PP Mix	5µl	1
IVS6 Wild PP Mix	5µl	1
IVS6 Mutant PP Mix	5µl	1
IVS Wild 110 PP Mix	5µl	1
IVS Mutant 110 PP Mix	5µl	1

Codon Wild 8/9 PP Mix	5µl	1
Codon Mutant 8/9 PP Mix	5µl	1
Codon Wild 41/42 PP Mix	5µl	1
Codon Mutant 41/42 PP Mix	5µl	1
Positive control	10µl	1

Storage

- The kit is shipped on gel ice. Upon arrival, all components should be stored in -20°C. They are stable until the expiration date stated on the label.
- Repeated thawing and freezing should be avoided, as this might affect the performance of the assay.
- If the reagents are to be used only intermittently, they should be frozen in aliquots. Storage at 2 to 8°C should not exceed a period of 5 hours.

Material and instruments required

- Real-time PCR instrument having FAM channel
- Automatic Nucleic acid extraction system or spin column based purification kit for the purification of nucleic acids
- Desktop centrifuge having 13000rpm or above with a rotor for 1.5/2 ml reaction tubes
- Centrifuge with a rotor for PCR strips/tubes and 96 well plates
- Optical cap qPCR tubes or strips or 96 wells
- Micro Pipettes (variables)
- Micro Pipette tips with filters (disposable)
- Powder-free gloves (disposable)

[Please ensure that all instruments used have been installed, calibrated, checked and maintained according to the manufacturer's instructions and recommendations.]

Product Use Limitations

- All reagents may exclusively be used in molecular diagnosis.
- The product is to be used by personnel specially instructed and trained in Molecular diagnosis.
- Strict compliance with the user manual is required for optimal PCR results.
- Attention should be paid to expiration dates printed on the box and labels of all components. Do not use expired components.

- Wear protective disposable powder-free gloves, a laboratory coat and eye protection when handling specimens and kit components.
- Avoid microbial and nuclease (RNase/RNase) contamination of the specimens and the components of the kit.
- Always use RNase/RNase-free disposable pipette tips with aerosol barriers.
- Use separated and segregated working areas for sample preparation, reaction setup and amplification/detection activities.
- The workflow in the laboratory should proceed in unidirectional manner. Always wear disposable gloves in each area and change them before entering a different area.
- Store positive and/or potentially positive material separated from all other components of the kit.
- Do not open the reaction tubes/plates post amplification, to avoid contamination with amplicons.
- Additional controls may be tested according to guidelines or requirements of local, state and/or federal regulations or accrediting organizations.
- Do not autoclave reaction tubes after the PCR, since this will not degrade the amplified nucleic acid and will bear the risk to contaminate the laboratory area.
- Discard sample and assay waste according to your local safety regulations.

Technical Assistance

For technical assistance and more information, please contact;

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Product description

HELINI Beta Thalassemia Real-time PCR Kit constitutes a ready-to-use system for the detection of 7 somatic human beta globin gene mutations using polymerase chain reaction (PCR). It contains reagents and enzymes for the specific amplification for the direct detection of the specific amplicon in fluorescence channels FAM. External positive control is supplied to assist the run.

Specificity

Beta-Thalassemia mutation primer and probe have been designed for the specific and exclusive *in vitro* detection of following mutations;

Region	Mutation
IVS1.1	G>A
IVS2.1	G>A
IVS1.110	G>A
IVS1.6	T>C
IVS1-5	G>C
Codon 41/42	(-TCCT)
Codon 8/9	(+G) -

The primers and probe sequences in this kit have 100% homology with clinically relevant reference sequences based on a comprehensive bioinformatics analysis.

Dynamic linear range

The linear range was evaluated by analyzing a logarithmic dilution series of mutation specific pDNA concentrations ranging from 1.00E+09 to 1.00E+00copies/μl. At least six replicates per dilution were analyzed. The linear range is 1.00E+06 to 1.00E+00copies/μl.

Analytical Sensitivity

The analytical sensitivity is defined as the concentration of plasmid DNA molecules (copies/ μ l) that can be detected with a positivity rate of 95%. The analytical sensitivity was determined by analysis of dilution series of quantified mutation specific pDNA from 0.001copies to 10copies/ μ l in triplicates. Under optimal PCR conditions, the analytical sensitivity is 1 copy per micro liter.

Note:

DNA Purification

Purified DNA is the starting material for the Real-time PCR assay. The quality of the purified DNA has a profound impact on the performance of the entire test system. It has to be ensured that the purification system used for DNA purification is compatible with real-time PCR technology.

If you are using a spin column based sample preparation procedure having washing buffers containing ethanol, it is highly recommended to perform an additional centrifugation step for 5 min at approximately 17000 x g (~ 13000 rpm), using a new collection tube, prior to the elution of the DNA.

Detection Protocol

Things to do before starting

- Before use, all kit components need to be thawed completely, mixed by gently inverting and centrifuged briefly.
- Make sure that Positive and Negative control is included in every run.
- Include 0.5 reaction volume for pipetting error while calculating the volume for total number of reactions.

Component	Wild	Mutant
Master Mix	10 μ l	10 μ l
PP Mix	5 μ l	5 μ l
DNA [>5 ng/ μ l]	10 μ l	10 μ l
Final reaction volume	25 μ l	25 μ l

For targets, there will be two tube reactions, wild and mutant. Totally there will be a fourteen tubes reaction per sample.

Negative Control setup [NTC]

Add 10 μ l of PCR grade water.

Positive Control setup

Add 10 μ l of the Positive control

Centrifuge PCR vials briefly before placing into thermal cyclers.

[Note: There should not be any bubbles in the reaction mix. Bubbles interfere with fluorescence detection.]

Programming Thermal cycler

Sample volume	25µl
Fluorescence Dyes	FAM
Passive reference	None
Ramping rate	Default

Thermal Profile

	Step	Time	Temp
	Taq enzyme activation / Hold	15min	95°C
35 cycles	Denaturation	20sec	95°C
	Annealing/Data collection*	20sec	63°C
	Extension	20sec	72°C

Data collection/Acquisition	All Targets in FAM
FAM	

Reading the graph:**Step-1 –Negative and Positive control validation**

Select the NTC and Positive control and view the graph of amplification.

The NTC must be flat with no Ct value. If required adjust the threshold value just above the NTC. The Positive control must be amplified.

NTC justifies NO contamination in the reagent as well as fine pipetting and its environment. PC justifies the reagents storage conditions and reaction parameters are as prescribed.

Step-2 Test Sample status

In FAM channel, select test sample well one by one, analyze the graph/amplification.

Interpretation:

Wild	Mutant	Sample Status	
Positive	Negative	Homozygous Wild	
		IVS1	G/G
		IVS2	G/G
		IVS5	G/G
		IVS6	T/T
		IVS110	G/G
		IVS 41/42	No G deletion
	IVS 8/9	No Insertion	
Negative	Positive	Homozygous Mutant	
		IVS1	A/A
		IVS2	A/A
		IVS5	C/C
		IVS6	C/C
		IVS110	A/A
		IVS 41/42	G deletion
	IVS 8/9	TCCA insertion	
Positive	Positive	Heterozygous	
		IVS1	G/A
		IVS2	G/A
		IVS5	T/C
		IVS6	G/C
		IVS110	G/A
		IVS 41/42	G+/G-
	IVS 8/9	-TCCA/+TCCA	

Limitations

Good laboratory practice is essential for proper performance of this assay. Strict compliance with the instructions for use is required for optimal results.

Analysts should be trained and familiar with testing procedures and interpretation of results prior to performing the assay.

A false negative result may occur due to improper collection, transport or handling. Appropriate specimen collection, transport, storage and processing procedures are required for the optimal performance of this test.

Extreme care should be taken to preserve the purity of the components of the kit and reaction setups. All reagents should be closely monitored for impurity and contamination. Any suspicious reagents should be discarded.

The presence of PCR inhibitors may cause under quantification, false negative or invalid results.

Potential mutations within the target regions of the genome covered by the primers and/or probes used in the kit may result in under quantification and/or failure to detect.

As with any diagnostic test, the HELINI Beta-Thalassemia Real-time PCR results need to be interpreted in consideration of all clinical and laboratory findings.

Quality Control

In accordance with the HELINI Biomolecules in house Quality Management System, each lot of HELINI Beta-Thalassemia Real-time PCR kit is tested against predetermined specifications to ensure consistent product quality.

Explanations of symbols



In vitro diagnostic medical device



Catalogue number



Pack size – number of tests



Manufacturer

Manufactured by

HELINI Biomolecules,

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