Raw Materials for MDx

Reliable Partner
for DNA Technologies

Customized Molecular Diagnostic Enzymes & Kits
Fast Real-Time PCR / RT-PCR
Multiplex Real-Time PCR / RT-PCR
Direct Real-Time PCR / RT-PCR

ISO 13485 : 2016

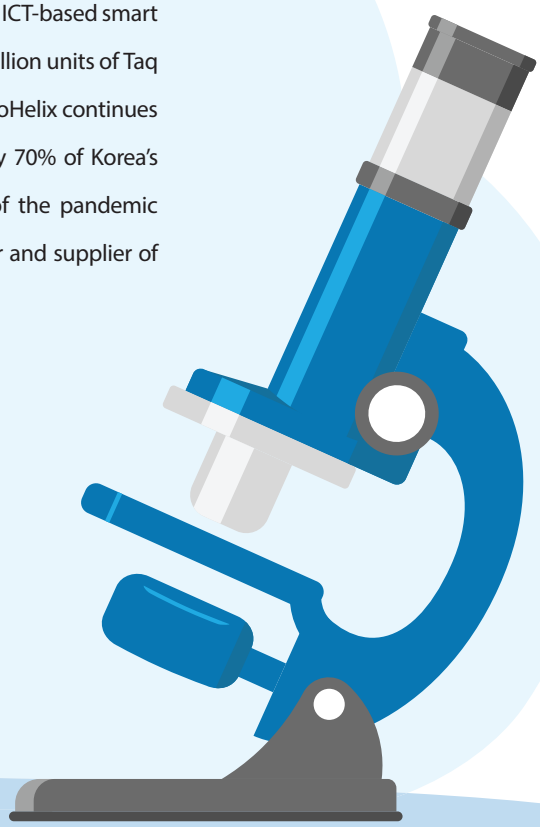
INNOBIZ

NANOHELIX
Reliable Partner for DNA Technologies

Who We Are

Established in 2008, NanoHelix began by producing research-use enzymes and now manufactures large-scale for molecular diagnostic applications. Utilizing an ICT-based smart factory system with ISO 13485:2016 and GMP facilities, we can produce 5 billion units of Taq DNA polymerase annually; equivalent to more than 2 billion PCR tests. NanoHelix continues to develop consistently reliable products, reinforcing our ability to supply 70% of Korea's COVID-19 MDx raw material reagents and putting us at the forefront of the pandemic response. We will maintain our reputation as an exceptional manufacturer and supplier of raw materials for molecular diagnostics and nucleic acid-based MDx kits.

Contract Manufacturer
Custom Development
OEM Business



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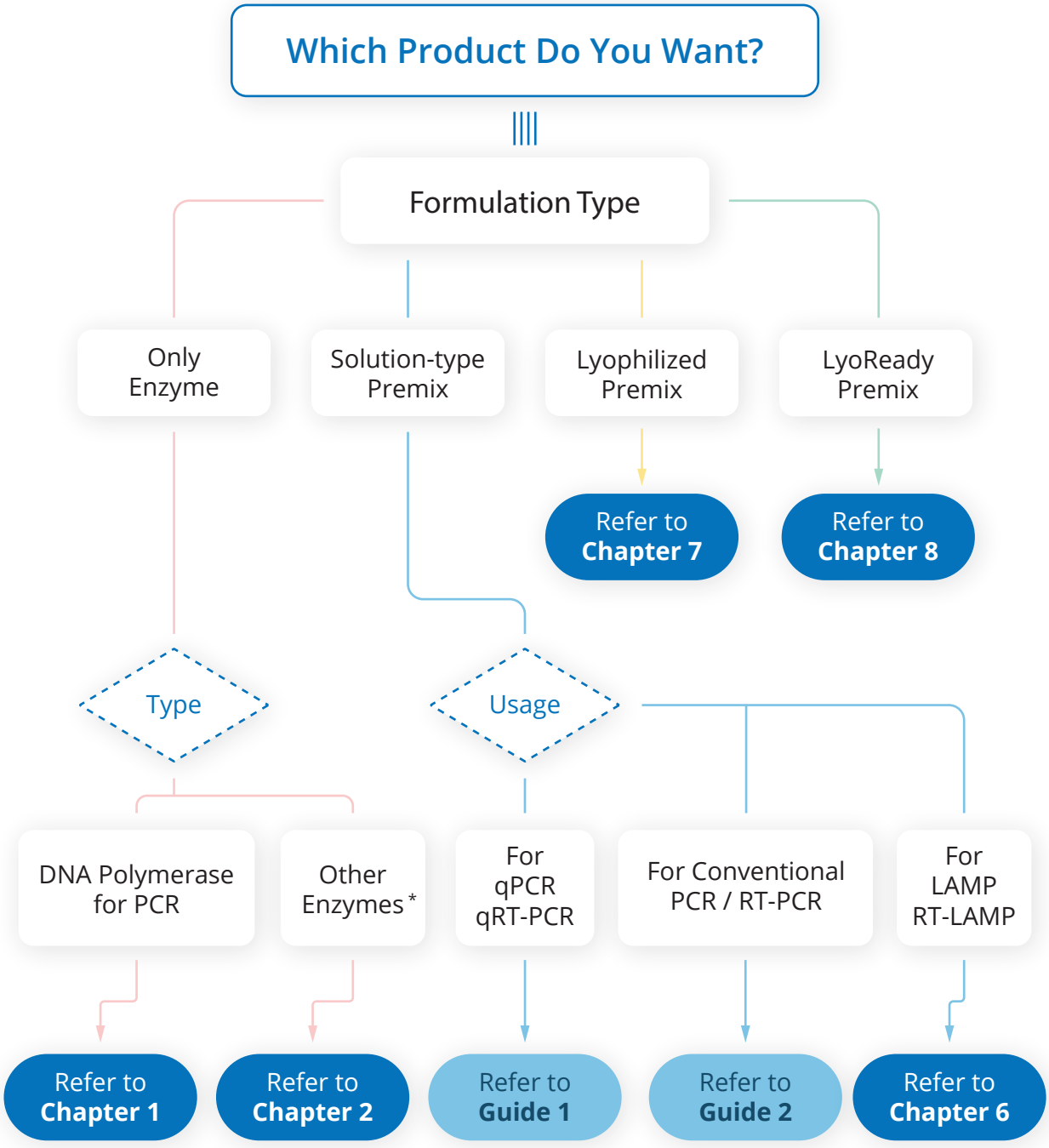


*This category includes enzymes that, while not DNA polymerases, are essential for PCR or LAMP assays.

High-Quality Lyophilization Solutions for MDx Applications

NanoHelix offers high-quality, lyophilization-ready reagents designed to meet the highest standards. These lyophilized reagents provide significant advantages over traditional premixes, such as stable activity, room temperature storage, and convenient transport. Glycerol-free premixes are formulated with the right excipients to ensure stability and effectiveness throughout the lyophilization process.

LyoReady premixes, which are glycerol-free reagents in solution form, come ready for immediate use in lyophilization by customers equipped with the necessary systems. Each premix contains the essential excipients required for successful lyophilization.

With cutting-edge technology, NanoHelix is committed to providing advanced LyoReady and lyophilized premixes as key raw materials for MDx applications.

Product Selection Guide

Guide 1. Real-Time PCR Master Mix Selection Guide

Template	Base Enzyme	Product Name	Assay Type	Hot-Start	UDG System	Sensitivity	Specificity	Fast & Ultrafast Amplification	Stability	Multiplex	Direct Use of Crude Sample	2x Premix
DNA	HelixAmp™ *Taq* Polymerase	1-sec qPCR Premix [Probe] (Ver. 2.0)	P	A	O	***	***	Y	**	**	N	Y
		Premier 2x qPCR Kit [Green]	I	A	N	**	**	N	**	**	N	Y
		Superplex qPCR Kit [Probe]	P	C	Y	**	***	N	**	***	N	Y
		2x qPCR Premix [Green]	I	C	N	**	***	N	**	**	N	Y
		2x qPCR Premix [Probe]	P	C	N	**	***	N	**	**	N	Y
		Direct qPCR Kit [Green]	I	A	N	**	***	N	**	**	Y	Y
		Direct qPCR Kit [Probe]	P	A	N	**	***	N	**	**	Y	Y
		DirectFast qPCR Kit	P	A	Y	***	***	Y	**	**	Y	Y
RNA	HelixAmp™ *Taq* Polymerase & HelixCript™ *Thermo* Reverse Transcriptase	1-sec qRT-PCR Premix [Probe] (Ver. 2.0)	P	A	O	***	***	Y	**	**	N	Y
		qRT-PCR Kit [v6a] [UDG system]	P	A	Y	***	***	Y	**	**	N	N
		qRT-PCR Kit [v4] [UDG system]	P	C	Y	**	***	N	**	**	N	N
		qRT-PCR Kit [Green]	I	C	N	**	***	N	**	**	N	N
		qRT-PCR Kit [Probe]	P	C	N	**	***	N	**	**	N	N
		DirectFast qRT-PCR Kit	P	A	Y	**	**	Y	**	**	Y	N

***: Best **: Excellent *: Good
I: Intercalating dye type P: Probe type Y: Yes N: No O: Optional C: Chemically-modified A: anti-*Taq* antibody-coupled

Guide 2. Conventional PCR Premix Selection Guide

Template	Base Enzyme	Product Name	Hot-Start	UDG System	Sensitivity	Specificity	Stability	Multiplex	Direct Use of Crude Sample	2x Premix
DNA	HelixAmp™ *Taq* Polymerase	Multiplex PCR 2x Premix	C	O	**	***	**	***	N	Y
		Ab+Taq 2x Premix	A	-	***	**	**	**	N	Y
		Hot-Taq 2x Premix	C	-	**	***	**	**	N	Y
		Taq 2x Premix	N	-	**	*	**	**	N	Y
RNA	HelixAmp™ *Taq* Polymerase & HelixCript™ *Thermo* Reverse Transcriptase	One-Step RT-PCR Kit [*Hot-Taq*]	C	O	**	***	**	**	N	N
		One-Step RT-PCR Kit [*Ab+Taq*]	A	O	***	**	**	**	N	N
		Direct RT-PCR Kit	A	O	**	**	**	**	Y	N

***: Best **: Excellent *: Good
Y: Yes N: No O: Optional C: Chemically-modified A: anti-*Taq* antibody-coupled

01

PCR Enzymes for MDx

Taq Polymerase

Taq Polymerase, Glycerol-free

Hot-Taq **Polymerase**

Ab+Taq **Polymerase**

Ab+Taq **Polymerase, Glycerol-free**

Premium-Taq **Polymerase**

HelixAmp™ *Taq* Polymerase

- ✓ Robust enzyme for routine PCR
- ✓ Low bacterial DNA contamination
- ✓ High yields & High sensitivity

Description

HelixAmp™ *Taq* Polymerase is a recombinant enzyme expressed and purified from a bacterial host cell harboring *Thermus aquaticus* DNA polymerase gene. HelixAmp™ *Taq* Polymerase is an engineered *Taq* DNA polymerase enforced its thermostability and template sensitivity. This highly purified thermostable DNA polymerase with unique NanoHelix's purification process is quite suitable for routine PCR.

Application

- Routine PCR and RT-PCR
- Conventional and real-time PCR
- PCR for molecular diagnostics
- Manufacture of amplification mixtures

Products

Cat.No.	Product	Feature
BT5	HelixAmp™ *Taq* Polymerase	5 units/μl
BT50	HelixAmp™ *Taq* Polymerase	50 units/μl

Data

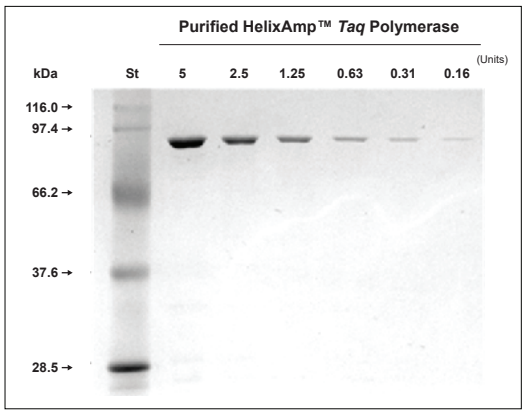


Fig. The purity of HelixAmp™ *Taq* polymerase.
The purity and concentration of the prepared enzyme were analyzed by SDS-PAGE with each units represented. St: Standard protein marker.

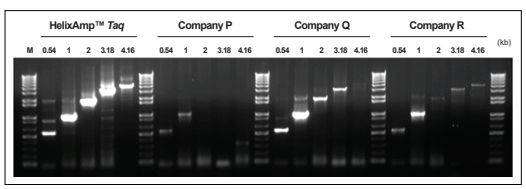


Fig. Comparison of the PCR performances of commercial *Taq* polymerases on various sizes of targets.
The PCRs were performed with 1.25 units of *Taq* polymerases and supplied buffers from each manufacturer. All other components and conditions applied are identical through the reactions.

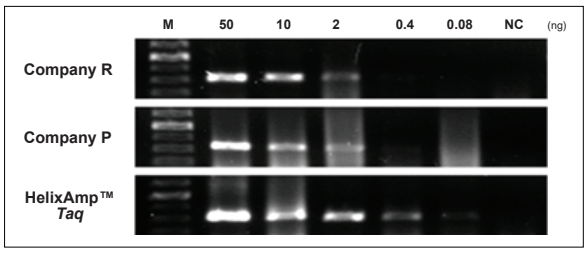


Fig. The Sensitivity of HelixAmp™ *Taq* Polymerase.
Taq polymerase amplified target from genomic region of human PKD(polycystic kidney disease) gene at various concentrations of human genomic DNA. 1.25 units of *Taq* DNA polymerases manufactured by NanoHelix and other companies were used.

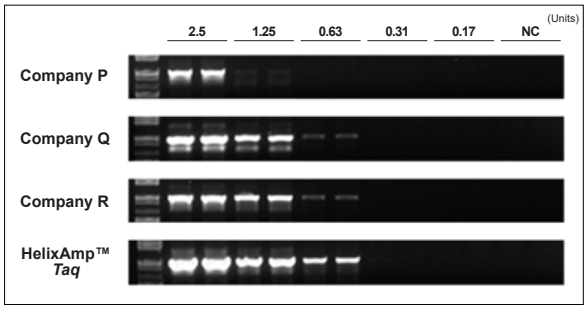


Fig. Superior activity of HelixAmp™ *Taq* Polymerase.
The PCRs were performed with indicated units of *Taq* polymerases and supplied buffers from each manufacturer. All other components and conditions applied are identical through the reactions. NC, negative control reactions were performed with each 2.5 units of enzymes without template DNA.

HelixAmp™ *Taq* Polymerase, Glycerol-free

- ✓ Lyophilization ready for preparation of dried amplification mixtures
- ✓ Robust enzyme for routine PCR
- ✓ Low bacterial DNA contamination
- ✓ High yields & High sensitivity

Description

HelixAmp™ *Taq* Polymerase, Glycerol-free is a lyophilization-compatible version of a highly purified recombinant standard PCR enzyme. Host DNAs are removed almost entirely from the enzyme to minimize false positive reactions during molecular diagnostic applications.

Application

- Routine PCR and RT-PCR
- Conventional and real-time PCR
- PCR for molecular diagnostics
- Manufacture of amplification mixtures

Products

Cat.No.	Product	Feature
BGT5	HelixAmp™ *Taq* Polymerase, Glycerol-free	5 units/μl
BGT50	HelixAmp™ *Taq* Polymerase, Glycerol-free	50 units/μl

HelixAmp™ *Hot-Taq* Polymerase

- ✓ Chemically modified *Taq* DNA polymerase
- ✓ Automatic hot-start PCR enzyme
- ✓ Convenience of reactions set up at room temperature
- ✓ The highest specificity of PCR amplification
- ✓ Enzyme for real-time PCR and multiplex PCR
- ✓ Enzyme for high GC target amplification

Description

HelixAmp™ *Hot-Taq* Polymerase is a chemically-modified form of purified *Taq* DNA polymerase and suitable for high-specificity hot-start PCR, real-time PCR and multiplex PCR. The attached heat-labile chemical moiety makes *Taq* DNA polymerase inactive and suppresses the polymerization from non-specifically bound primers which occurs during the setting of PCR mix and first ramp-up of thermal cycling. During the first denaturation step of PCR the chemical moieties are released from *Taq* polymerase and the enzyme turns to be active. With the high specificity, HelixAmp™ *Hot-Taq* Polymerase shows high performance in the reactions of genotyping(microsatellite or SNP), multiplex PCR, and real-time PCR.

Application

- Hot-start PCR, multiplex PCR, real-time PCR
- High specific and sensitive PCR
- Amplification of complex DNA and cDNA
- PCR for molecular diagnostics

Products

Cat.No.	Product	Feature
BHT5	HelixAmp™ *Hot-Taq* Polymerase	5 units/μl
BHT50	HelixAmp™ *Hot-Taq* Polymerase	50 units/μl

Data

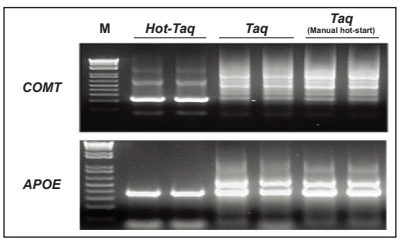


Fig. The high specificity of HelixAmp™ *Hot-Taq* Polymerase.
The problematic targets of human genomic DNA are successfully amplified with *Hot-Taq* polymerase. The specific amplifications of *COMT* gene encoding cathecol-O-methyl transferase(COMT) and *APOE* gene from human genomic DNA template are shown. Manual hot-start was performed as adding *Taq* DNA polymerase to reaction mixture at 85°C. M: HelixRuler™ 1 kb(+) DNA ladder.

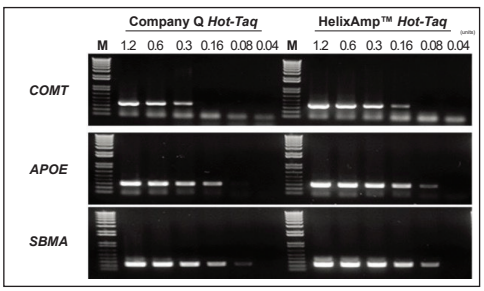


Fig. HelixAmp™ *Hot-Taq* Polymerase possesses the high activity.
The enzyme activity of *Hot-Taq* polymerase was evaluated by the amplification of *COMT*, *APOE*, or *SBMA* gene from 100 ng human genomic DNA templates with various concentrations of enzyme. The activity comparison was performed with other competitive product of chemically modified hot-start *Taq* DNA polymerase.

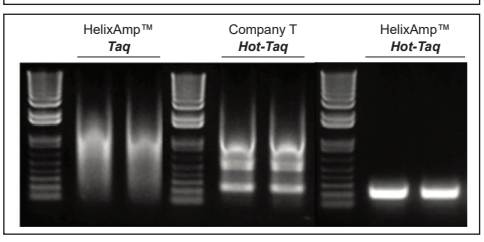


Fig. HelixAmp™ *Hot-Taq* Polymerase is highly specific.
100 ng human genomic DNA was used as template. The specificity of *Hot-Taq* polymerase is shown by the amplification of *COMT* gene encoding cathecol-O-methyl transferase(COMT) compared with *Taq* polymerase and an antibody-type hot-start *Taq* polymerase.

HelixAmp™ *Ab+Taq* Polymerase

- ✓ Anti-*Taq* antibody complexed *Taq* DNA polymerase
- ✓ Automatic hot-start PCR enzyme
- ✓ Fast enzyme activation
- ✓ High specific and sensitive PCR enzyme

Description

HelixAmp™ *Ab+Taq* Polymerase is an anti-*Taq* antibody complex form of *Taq* polymerase and ideal for automatic hot-start PCR. This antibody-mediated hot-start polymerase provides highly specific and sensitive PCR amplification.

Application

- Antibody-mediated hot-start PCR
- High specific conventional and real-time PCR
- Fast PCR assays with a short enzyme activation time and fast cycling protocols
- Multiplex PCR
- PCR for molecular diagnostics

Products

Cat.No.	Product	Feature
BATA5	HelixAmp™ *Ab+Taq* Polymerase	5 units/μl
BATA10	HelixAmp™ *Ab+Taq* Polymerase	10 units/μl

HelixAmp™ *Ab+Taq* Polymerase, Glycerol-free

- Lyophilization-compatible(glycerol-free)
- Anti-*Taq* antibody complexed *Taq* DNA polymerase
- Automatic hot-start PCR enzyme
- Fast enzyme activation
- High specific and sensitive PCR enzyme

Description

HelixAmp™ *Ab+Taq* Polymerase, Glycerol-free is a lyophilization-compatible version of HelixAmp™ *Ab+Taq* Polymerase, an anti-*Taq* antibody complex form of *Taq* polymerase and ideal for automatic hot-start PCR. This antibody-inhibited hot-start polymerase provides highly specific and sensitive PCR amplification.

Application

- Antibody-mediated hot-start PCR
- High specific conventional and real-time PCR
- Fast PCR assays with a short enzyme activation time and fast cycling protocols
- Multiplex PCR
- PCR for molecular diagnostics
- Manufacture of dried amplification mixtures

Products

Cat.No.	Product	Feature
BATA5GF	HelixAmp™ *Ab+Taq* Polymerase, Glycerol-free	5 units/μl

HelixAmp™ *Premium-Taq* Polymerase

- ✓ Minimize the non-specific amplification by a dual control system;
  - Anti-*Taq* antibody complexed *Taq* DNA polymerase
  - PMT technology applied buffer system
- ✓ High specific and sensitive PCR enzyme
- ✓ Automatic hot-start PCR enzyme
- ✓ Fast enzyme activation

Description

HelixAmp™ *Premium-Taq* Polymerase provides the most specific amplification using a dual system of antibody-mediated hot-start polymerase and PMT(Polymerase Modulator on Temperature)-applied buffer. Anti-*Taq* antibody inhibits the *Taq* polymerase activity until it reaches denaturation temperature while the PMT-applied buffer reduces the primer-dimer formation and non-specific amplification during the PCR cycles.

Application

- Antibody-mediated hot-start PCR
- High specific amplification and minimize the primer dimer formation
- Fast PCR assays with a short enzyme activation time and fast cycling
- Multiplex PCR
- PCR for molecular diagnostics

Products

Cat.No.	Product	Feature
BPT5	HelixAmp™ *Premium-Taq* Polymerase	5 units/μl

Data

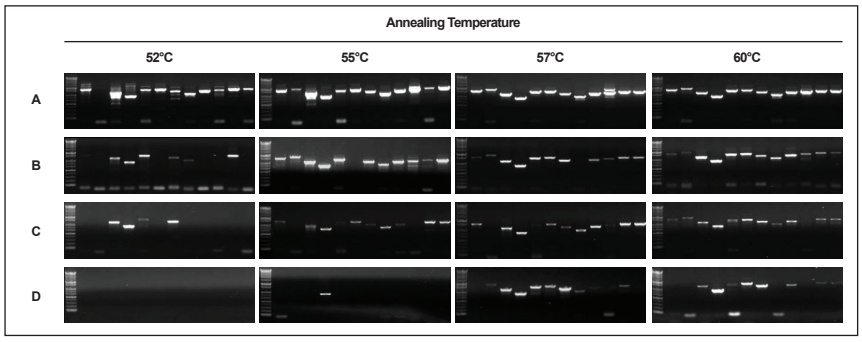


Fig. Comparison of HelixAmp™ *Premium-Taq* Polymerase with other company's hot-start versions of DNA polymerases.
12 different primer sets designed from human genome were used in this PCR. PCR was performed using 10 ng of human genomic DNA under various annealing temperature. **A: NanoHelix**, B: Company I[Korea], C: Company I[USA], D: Company T[Japan].

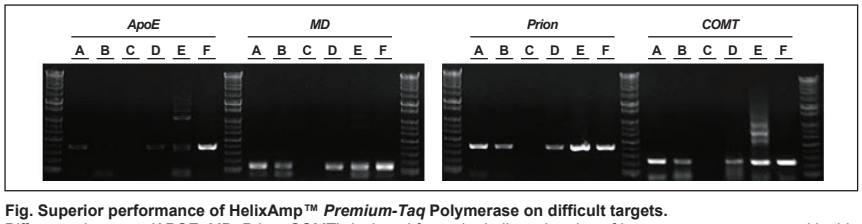


Fig. Superior performance of HelixAmp™ *Premium-Taq* Polymerase on difficult targets.
Different primer sets(APOE, MD, Prion, COMT) designed from the indicated region of human genome were used in this PCR. PCRs were performed using 10 ng of human genomic DNA. All of the DNA polymerases are hot-start versions of each brands. A: Company T[Japan], B: Company I[Korea], C: Company B[Korea], D: Company I[USA], E: Company S[Korea], **F: NanoHelix**.

02

Enzymes for MDx

Thermo Reverse Transcriptase

Uracil-DNA Glycosylase (UDG)

Heat Labile UDG

Cod UDG

RNase Inhibitor (Recombinant)

Bst DNA Polymerase, LF (Ver. 3.0)

HelixCript™ *Thermo* Reverse Transcriptase

- ✓ Modified MMLV RTase, RNaseH negative
- ✓ Active at 42~55°C, Optimum at 50°C
- ✓ High processivity(Up to 12 kb or more) and sensitivity
- ✓ Superior performance in RT-PCR

Description

HelixCript™ *Thermo* Reverse Transcriptase, a thermostable and RNase H-negative variant of M-MLV reverse transcriptase(RTase), is an enzyme to synthesize cDNAs from RNA templates at a temperature range of 42~55°C and shows the highest activity at 50°C. The high processivity and productivity of HelixCript™ *Thermo* Reverse Transcriptase can synthesize cDNA up to 12 kb from an RNA template.

Application

- Generation of the first-strand cDNA up to 12 kb for libraries or cloning
- Two-step or one-step RT-PCR applications
- Conventional or real-time RT-PCR
- RT-PCR for detection of viral RNA

Products

Cat.No.	Product	Feature
BRT	HelixCript™ *Thermo* Reverse Transcriptase	200 units/μl
BCRT	HelixCript™ *Thermo* Reverse Transcriptase	2,000 units/μl

Data

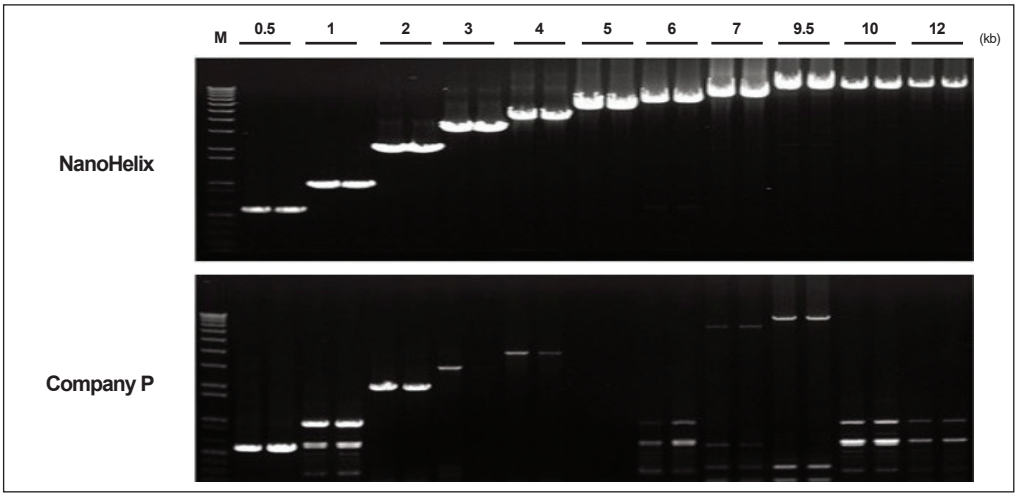


Fig. Comparison of activity of HelixCript™ *Thermo* Reverse Transcriptase with a competitor by RT-PCR.
Total RNAs were extracted from human blood. The first-strand cDNAs were synthesized using total 700 ng RNA, oligo-d(T) primer, 200 U HelixCript™ *Thermo* Reverse Transcriptase at 50°C or a competitor's 200 U M-MLV RTase(Company P, USA) at 42°C. 10% of the cDNA synthesized in each RT reaction was used in a 50 μl PCR reaction with primer sets targeting a fragment of the human dynein gene and 2.5 units of HelixAmp™ *HyperSense-Taq* DNA Polymerase.

HelixZyme™ Uracil-DNA Glycosylase (UDG)

- ✓ Removing uracil-containing DNA
- ✓ Elimination of carryover contamination
- ✓ Engineered for heat susceptibility
- ✓ Ideal enzyme for conventional and real-time PCR with dUTP

Description

HelixZyme™ Uracil-DNA Glycosylase (UDG) is an engineered *E. coli* enzyme catalyzing the hydrolysis of the N-glycosidic bond between the uracil and sugar, leaving an apyrimidinic site in uracil-containing single or double-stranded DNA. For PCR diagnosis, UDG can be used for efficient removal of carryover contaminated uracil-containing DNA.

Application

- Prevention of carryover contamination
- Removing uracil-containing DNA
- Genotyping and molecular diagnosis

Products

Cat.No.	Product	Feature
BUDG1	HelixZyme™ Uracil-DNA Glycosylase (UDG)	1 unit/μl
BUDG10	HelixZyme™ Uracil-DNA Glycosylase (UDG)	10 units/μl
BUDGH	HelixZyme™ Uracil-DNA Glycosylase, High Conc.	200 units/μl

HelixZyme™ Heat Labile UDG

- ✓ Removing uracil-containing DNA
- ✓ Heat-labile, inactivated at over 50°C
- ✓ Ideal enzyme for conventional and real-time RT-PCR with dUTP

Description

HelixZyme™ Heat Labile UDG is a recombinant uracil DNA glycosylase from marine bacterium BMTU 3346. UDG catalyzes the hydrolysis of the N-glycosidic bond between the uracil and sugar, leaving an apyrimidinic site in uracil-containing single or double-stranded DNA. HelixZyme™ Heat Labile UDG is fully active in the temperature range of 15 to 25°C and inactivated at over 50°C. Due to this characteristic, this enzyme is ideal for applying to a one-step RT-PCR system to remove the contaminated uracil-containing DNA in the reaction.

Application

- Prevention of carryover contamination in RT-PCR

Products

Cat.No.	Product	Feature
BHLU1	HelixZyme™ Heat Labile UDG	1 unit/μl
BHLU10	HelixZyme™ Heat Labile UDG	10 units/μl
BHLU20	HelixZyme™ Heat Labile UDG	20 units/μl

HelixZyme™ Cod UDG

- ✓ Removing uracil-containing DNA
- ✓ Heat-labile, inactivated at over 50°C
- ✓ Ideal enzyme for conventional and real-time RT-PCR with dUTP

Description

HelixZyme™ Cod UDG is a recombinant uracil-DNA glycosylase from *Gadus morhua* expressed in *E. coli.* UDG catalyzes the hydrolysis of the N-glycosidic bond between the uracil and sugar, leaving an apyrimidinic site in uracil-containing single or double-stranded DNA. Cod UDG is fully active in the temperature range of 15 to 25°C and inactivated at over 50°C. Due to this character, this enzyme is ideal for applying on the one-step RT-PCR system to remove the contaminated uracil-containing DNA in the reaction.
HelixZyme™ Cod UDG, Glycerol-free is a lyophilization-compatible version of HelixZyme™ Cod UDG.

Application

- Prevention of carryover contamination in RT-PCR

Products

Cat.No.	Product	Feature
BCODU1	HelixZyme™ Cod UDG	1 unit/µl
BCODU30	HelixZyme™ Cod UDG	30 units/µl
BCOUGF	HelixZyme™ Cod UDG, Glycerol-free	30 units/µl

HelixZyme™ RNase Inhibitor (Recombinant)

- ✓ Inhibits common eukaryotic RNases
- ✓ Active over a broad pH range(pH 5~8)
- ✓ Direct use of RT-PCR and real-time RT-PCR

Description

HelixZyme™ RNase Inhibitor (Recombinant), a recombinant protein of rat lung RNase inhibitor expressed in *E. coli*, effectively inactivates a broad spectrum of ribonuclease including RNase A, B, and T2. Use RNase inhibitor to protect the RNA in cDNA synthesis, one-step RT-PCR, RNA synthesis, RNA preparation, etc.
HelixZyme™ RNase Inhibitor (Recombinant), Glycerol-free is a lyophilization-compatible version of HelixZyme™ RNase Inhibitor (Recombinant).

Application

- cDNA synthesis / RT-PCR
- *In vitro* transcription / *In vitro* translation
- RNA isolation and purification

Products

Cat.No.	Product	Feature
BRNI	HelixZyme™ RNase Inhibitor (Recombinant)	40 units/μl
BRNIGF	HelixZyme™ RNase Inhibitor (Recombinant), Glycerol-free	40 units/μl

HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0)

- ✓ Thermophilic DNA polymerase
- ✓ Strong strand displacement activity
- ✓ Lacks 5’ → 3’ exonuclease activity
- ✓ A recombinant protein, expressed in *E. coli*

Description

HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0) is the genetically engineered form of the *Bacillus stearothermophilus* DNA polymerase protein that has significantly improved performance. HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0) is prepared from an *E. coli* strain containing the *Bacillus stearothermophilus* DNA polymerase gene, lacking the 5’ → 3’ exonuclease domain.

Application

- Isothermal amplification
- Strand displacement amplification
- DNA sequencing through high GC content regions

Products

Cat.No.	Product	Feature
B8BST3	HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0)	8 units/µl
B50BST3	HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0)	50 units/µl
B50BST3GF	HelixAmp™ *Bst* DNA Polymerase, (LF, Glycerol-free) (Ver. 3.0)	50 units/µl

03

Conventional PCR/RT-PCR Premixes

Multiplex PCR 2x Premix

Taq 2x Premix

Hot-Taq 2x Premix

Ab+Taq 2x Premix

One-Step RT-PCR Kit [Hot-Taq]

One-Step RT-PCR Kit [Ab+Taq]

Direct RT-PCR Kit

HelixAmp™ Multiplex PCR 2x Premix

- ✓ 2x premix for multiplex PCR, up to 13-plex
- ✓ Extreme specificity and high productivity
- ✓ Automatic hot-start PCR
- ✓ Convenient and fast setup for complex multiplexing PCR
- ✓ Prevention of carryover contamination by built-in UDG system

Description

HelixAmp™ Multiplex PCR 2x Premix, the best choice to set up complex multiplexing PCR, is a pre-mixed solution containing HelixAmp™ *Hot-Taq* Polymerase, dNTPs and an optimized buffer at 2x concentration. HelixAmp™ Multiplex PCR 2x Premix is designed to give hot-start PCR the highest specificity and minimize the interruptions among the primers in a reaction mixture. Carryover contaminated PCR products can be removed by applying the UDG system.

Application

- Multiplex PCR(conventional)
- Allele-specific PCR
- SNP analysis and genotyping

Products

Cat.No.	Product
BMPR	HelixAmp™ Multiplex PCR 2x Premix
BMPU	HelixAmp™ Multiplex PCR 2x Premix [UDG System]

HelixAmp™ *Taq* 2x Premix

- ✓ Convenient ready-to-use 2x master mix format
- ✓ UDG system: prevention of carryover contamination
- ✓ Robust enzyme for routine PCR
- ✓ Low bacterial DNA contamination
- ✓ High yields & High sensitivity

Description

HelixAmp™ *Taq* 2x Premix is a 2x concentrated mixture of *Taq* polymerase, a reaction buffer and dNTPs. This pre-mixed formulation is designed to save time while reducing error and contamination opportunities. Carryover contaminated PCR products can be removed by applying the UDG system.

Application

- Routine PCR(conventional)
- Fast and high throughput PCR
- Colony PCR

Products

Cat.No.	Product
BTPR	HelixAmp™ *Taq* 2x Premix
BTPU	HelixAmp™ *Taq* 2x Premix [UDG System]

HelixAmp™ *Hot-Taq* 2x Premix

- ✓ Ready-to-use 2x master mix format
- ✓ Chemically modified *Taq* DNA polymerase
- ✓ Automatic hot-start PCR enzyme
- ✓ Convenient room-temperature reaction setup
- ✓ UDG system: prevention of carryover contamination
- ✓ The highest specificity of PCR amplification

Description

HelixAmp™ *Hot-Taq* 2x Premix is an optimized mixture of *Hot-Taq* polymerase with reaction buffer and dNTPs as 2-fold concentration. *Hot-Taq* polymerase is a chemically-modified hot-start version of *Taq* DNA polymerase. This pre-mixed formulation is designed to save time and reduce error and contamination opportunities. Carryover contaminated PCR products could be removed by applying the UDG system.

Application

- High specific amplification of DNA fragments
- SNP analysis and genotyping
- Multiplex PCR
- Amplification of high GC or complex structured DNA
- Molecular diagnosis

Products

Cat.No.	Product
BHPR	HelixAmp™ *Hot-Taq* 2x Premix
BHPU	HelixAmp™ *Hot-Taq* 2x Premix [UDG System]

HelixAmp™ *Ab+Taq* 2x Premix

- ✓ Ready-to-use 2x master mix format
- ✓ Anti-*Taq* antibody complexed *Taq* DNA polymerase
- ✓ Automatic hot-start PCR enzyme
- ✓ Fast enzyme activation
- ✓ Convenient room-temperature reaction setup
- ✓ UDG system: prevention of carryover contamination
- ✓ High specificity, sensitivity, and productivity

Description

HelixAmp™ *Ab+Taq* 2x Premix is a 2x concentrated mixture of antibody-coupled *Taq* polymerase, a reaction buffer, and dNTPs. This pre-mixed formulation is designed to save time and reduce error and contamination opportunities. Carryover contaminated PCR products can be removed by applying the UDG system.

Application

- Antibody-mediated hot-start PCR
- High specific conventional and real-time PCR
- Fast PCR assays with a short enzyme activation time and fast cycling protocols
- Multiplex PCR
- SNP analysis and genotyping
- Molecular diagnosis

Products

Cat.No.	Product
BAPR	HelixAmp™ *Ab+Taq* 2x Premix
BAPU	HelixAmp™ *Ab+Taq* 2x Premix [UDG System]

HelixCript™ One-Step RT-PCR Kit [*Hot-Taq*]

- ✓ Fast and easy one-tube reaction
- ✓ Convenient enzyme mix and 2x reaction mix
- ✓ Heat-labile UDG system: prevention of carryover contamination
- ✓ Reduced contamination risk
- ✓ The highest specificity of PCR amplification

Description

HelixCript™ One-Step RT-PCR Kit [*Hot-Taq*] is designed for specific and sensitive amplification of target genes in one-tube reactions from RNA templates. *Thermo* Reverse Transcriptase, *Hot-Taq* polymerase, and RNase Inhibitor comprise the enzyme mixture. An optimized buffer is provided as a 2x Reaction mix containing a buffer, $MgCl_2$, and dNTPs. Optional UDG system includes the heat-labile UDG and dUTP.

Application

- Viral RNA detection
- Gene-expression analysis
- Molecular diagnosis
- Endpoint one-step RT-PCR from any RNA transcript

Products

Cat.No.	Product
BORTHT	HelixCript™ One-Step RT-PCR Kit [*Hot-Taq*]
BORTHT2U	HelixCript™ One-Step RT-PCR Kit [*Hot-Taq*] [UDG System]

Data

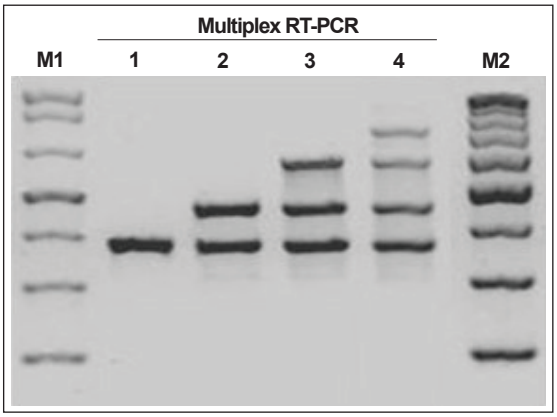


Fig. Multiplex one-step RT-PCR of up to 4 targets by HelixCript™ One-Step RT-PCR Kit [*Hot-Taq*]. Multiplex one-step RT-PCR in single-tube reaction was performed with total RNA extracted from hot pepper plant(*Capsicum annuum*) and by adding the indicated gene-specific primer sets. Each lane from 1 to 4 represents the progressive number of primer sets. The primer sets for the followed genes were used. *CaAPX1*(374 bp), *CaActin*(461 bp), *CaPF1*(615 bp), *Cadhn*(761 bp).

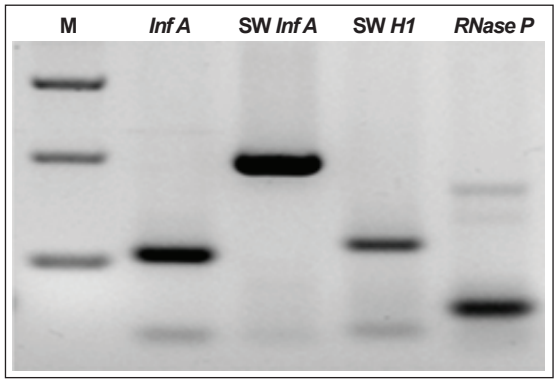


Fig. Viral RNA detection using HelixCript™ One-Step RT-PCR Kit [*Hot-Taq*]. Total RNA was isolated from a nasopharyngeal specimen of a new influenza virus-infected patient. Each reaction was performed with one of these target-specific primer sets: influenza A(*InfA*, 106 bp), Swine influenza A (SW *InfA*, 195 bp), Swine Influenza H1(SW *H1*,116 bp), or *RNase P*(human internal control, 65 bp).

HelixCript™ One-Step RT-PCR Kit [*Ab+Taq*]

- ✓ Fast and easy one-tube setup
- ✓ Convenient enzyme mix and 2x reaction mix
- ✓ Fast activation of PCR enzyme
- ✓ Heat-labile UDG system: prevention of carryover contamination
- ✓ Reduced contamination risk
- ✓ Highly specific and sensitive PCR amplification

Description

HelixCript™ One-Step RT-PCR Kit [*Ab+Taq*] is designed for specific and sensitive amplification of target genes in a one-tube reaction from RNA templates. *Thermo* Reverse Transcriptase, *Ab+Taq* polymerase, and RNase Inhibitor are supplied as an enzyme mixture.

Application

- Viral RNA detection
- Gene-expression analysis
- Molecular diagnosis
- Endpoint one-step RT-PCR from any RNA transcript

Products

Cat.No.	Product
BORTA	HelixCript™ One-Step RT-PCR Kit [*Ab+Taq*]
BORTAU	HelixCript™ One-Step RT-PCR Kit [*Ab+Taq*] [UDG System]

HelixAmp™ Direct RT-PCR Kit

- ✓ Reproducible
- ✓ Skip RNA purification
- ✓ Save time and cost
- ✓ UDG system: Prevention of carryover contamination

Description

HelixAmp™ Direct RT-PCR Kit is designed for the amplification and detection of target RNA directly from whole blood, animal tissues, and plant tissues without any RNA purification processes. The enzyme mix is an optimized blend of thermo reverse transcriptase, antibody-coupled hot-start *Taq* polymerase, and RNase inhibitor. The 2x buffer mix contains dNTPs, $MgCl_2$, and a unique buffer system to resist various PCR inhibitors in tissue samples. A uracil-DNA glycosylase and dUTP applied version is also available.

Application

- Point-of-care molecular diagnostics(POC MDx)
- Direct amplification of target RNA from samples
- Direct detection of RNA viral pathogens from various tissues

Products

Cat.No.	Product
BDRT	HelixAmp™ Direct RT-PCR Kit
BDRTU	HelixAmp™ Direct RT-PCR Kit [UDG System]

Data

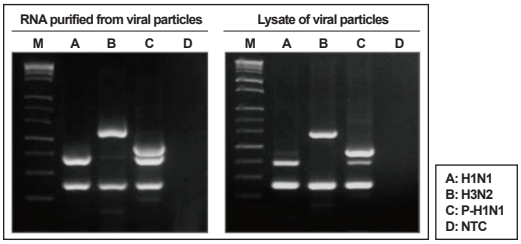


Fig. Comparison of multiple detection for swine influenza virus by direct RT-PCR with conventional RT-PCR from cultured virus. Lysate of influenza viral particles were applied into direct RT-PCR for multiple detection. Efficiency of detection sensitivity for direct RT-PCR was compared with conventional RT-PCR using total RNAs purified from the same amount of viral particles. NTC: No template control.

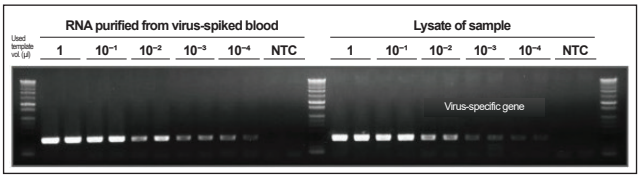


Fig. Comparison of detection sensitivity of viral target in direct RT-PCR with conventional RT-PCR from animal RNA virus-spiked whole blood. Lysate of blood spiked with virus particles were used for direct RT-PCR. Total RNAs purified from the same amount of virus-spiked blood were used for conventional RT-PCR. NTC: No template control.

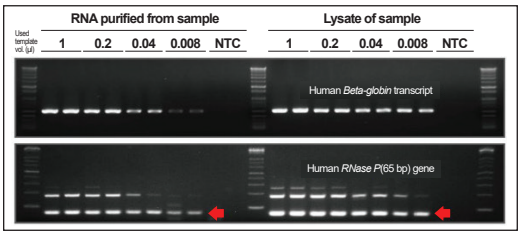


Fig. Comparison of amplification efficiency of direct RT-PCR with conventional RT-PCR from whole blood(upper panel) or buccal swab(lower panel). Lysate of each sample were used for direct RT-PCR as indicated volume above. For the comparison with reaction, the same amount of each sample were used in total RNA purification and the purified total RNAs were applied in conventional RT-PCR as indicated volume above. NTC: No template control.

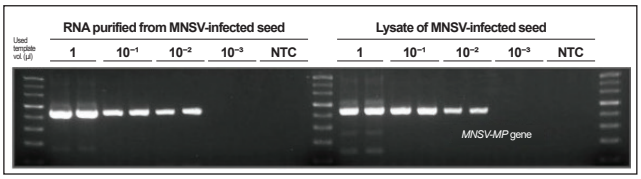


Fig. Comparison of detection sensitivity of direct RT-PCR with conventional RT-PCR from virus-infected plant seeds. Melon necrotic spot virus(MNSV)-infected melon seeds were used in this experiment. After mixing a grain of crushed seed with dilution buffer, lysate were used for direct RT-PCR. Total RNAs purified from the same amount of MNSV-infected plant seed were used for conventional RT-PCR. NTC: No template control.

04

Real-Time PCR Premixes

DirectFast qPCR Kit (V1a)

1-sec qPCR Premix [Probe] (Ver. 2.0)

Premier 2x qPCR Premix [Green]

Superplex qPCR Premix [Probe]

Direct qPCR Kit [Probe]

Direct qPCR Kit [Green]

2x qPCR Premix [Probe]

2x qPCR Premix [Green]

RealHelix™ *DirectFast* qPCR Kit (V1a)

- ✓ Direct: DNA extraction-free
- ✓ Fast(< 30 minutes) or ultrafast(< 20 minutes) for 40 cycles
- ✓ Multiplex: Up to 5-plex probes in a reaction
- ✓ Antibody-mediated hot-start *Taq* polymerase
- ✓ UDG system: prevention of carryover contamination

Description

RealHelix™ *DirectFast* qPCR Kit (V1a) is designed for a probe-based rapid qPCR amplification directly from animal tissues, plant tissues, and various clinical samples(including whole blood, serum, urine, hair and swab collections) without any DNA purification processes. The 2x DirectFast qPCR Premix contains antibody-inhibited hot-start *Taq* DNA polymerase, thermo-labile uracil-DNA glycosylase, dUTP, dNTPs, $MgCl_2$, a stabilizer, and a unique buffer system to resist various PCR inhibitors of tissue samples. The applied UDG/dUTP system prevents the carryover contamination of PCR products from previous reactions.

Application

- Direct and quantitative real-time PCR

Products

Cat.No.	Product
BDFQPU-A	RealHelix™ *DirectFast* qPCR Kit (V1a)

Data

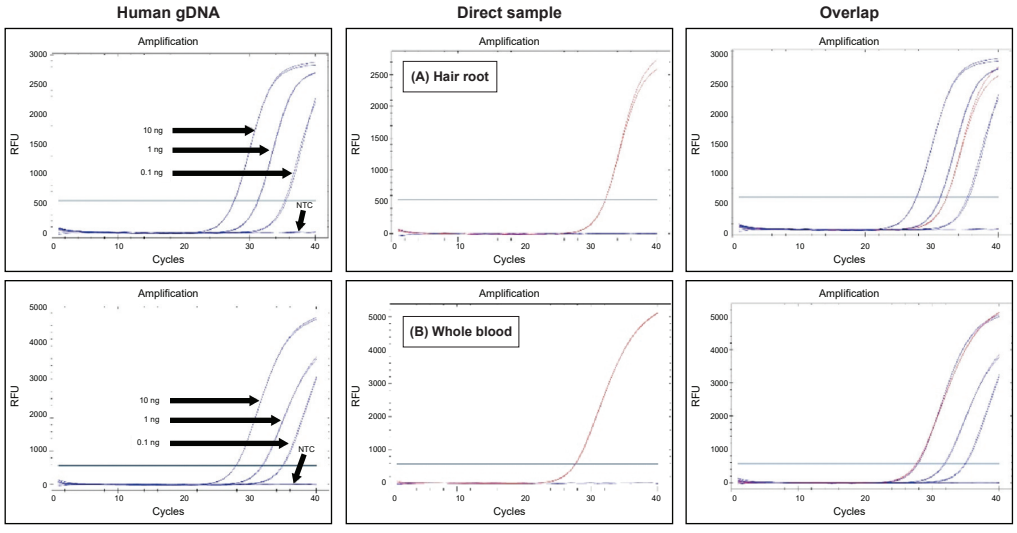


Fig. Direct and fast real-time PCR using RealHelix™ *DirectFast* qPCR Kit (V1a).
The lysates from human hair root or whole blood were prepared following the protocol of this kit. Each 3 µl(hair root) or 1 µl(whole blood) of lysate and purified human genomic DNA(10, 1, 0.1 ng) were analyzed using a human beta-globin gene-specific primers and probe labeled with FAM on a real-time PCR instrument, Bio-Rad CFX96.

RealHelix™ 1-sec qPCR Premix [Probe] (Ver. 2.0)

- ✓ Fast (< 30 minutes) or ultrafast (< 20 minutes) for 40 cycles
- ✓ Multiplex: Up to 5-plex probes in a reaction
- ✓ Sensitive: Reliable detection as low as 10 copies of target
- ✓ Antibody-mediated hot-start *Taq* polymerase

Description

RealHelix™ 1-sec qPCR Premix [Probe] (Ver. 2.0) is designed to perform fast real-time analysis of DNA samples using the fluorescent probe based detection. The convenient 2x concentrated premix contains an antibody-inhibited hot-start *Taq* polymerase(*Ab+Taq* polymerase), dNTPs, buffers, Mg^{2+}, and a stabilizing agent. The premix can also be used in combination with ROX reference dye(supplied separately) in PCR instruments that are compatible with the evaluation of the ROX signal. The outstanding fast real-time assay (between 30-60 min.) combined with high specificity and sensitivity is achieved with a unique buffer system and optimized hot-start polymerase. ROX reference dye is available separately upon request. The product applied with UDG system(HL-UDG/dUTP) prevents the carryover contamination of PCR products from previous reactions.

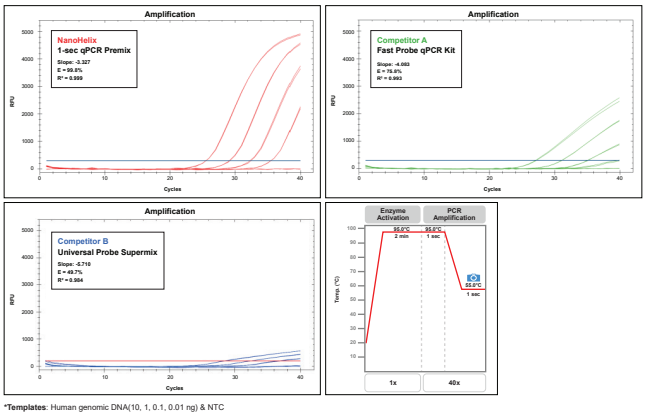
Application

- Fast real-time PCR analysis with labeled-probes
- Multiple target detection and quantification
- SNP analysis and genotyping
- Microbial and viral pathogen detection
- Molecular diagnosis

Products

Cat.No.	Product
BSQP2	RealHelix™ 1-sec qPCR Premix [Probe] (Ver. 2.0)
BSQPU2B	RealHelix™ 1-sec qPCR Premix [Probe] [UDG System] (V2B)

Data



*Templates: Human genomic DNA(10, 1, 0.1, 0.01 ng) & NTC

Fig. Comparison of RealHelix™ 1-sec qPCR Premix [Probe] (Ver. 2.0) with other competitor's products.
Hs-GloB gene fragment was amplified from 10-fold serial dilutions of human genomic DNA(10 ng ~ 0.01 ng/20 µl rxn) using RealHelix™ 1-sec qPCR Premix [Probe] (Ver. 2.0) and other competitor's fast probe qPCR kits under the same condition.

RealHelix™ *Premier* 2x qPCR Premix [Green]

- ✓ Premium real-time PCR kit with a DNA-intercalating fluorescent dye
- ✓ Unique buffer system and antibody-mediated hot-start enzyme
- ✓ Early Cq, high RFU, and reduced primer-dimer formation
- ✓ Convenient 2x concentrated premix
- ✓ Fast, specific, sensitive, and reliable
- ✓ ROX reference dye included

Description

RealHelix™ *Premier* 2x qPCR Premix [Green] is designed to perform a rapid, highly specific, and sensitive real-time quantification of target DNA. Specially designed buffer and antibody-mediated hot-start enzyme considerably reduce the primer dimer formations and ensure producing reliable data. The convenient 2x concentrated premix contains *Ab+Taq* polymerase, dNTPs, buffers, Mg^{2+}, a green fluorescent dye, ROX passive dye, and stabilizing agent. The ROX dye does not take part in the PCR reaction but allows to normalize for non-PCR related signal variation and provides a baseline in multiple reactions.

Application

- Real-time quantification of target DNA
- Automated high throughput real-time PCR
- Gene expression analysis of cDNA
- SNP analysis and genotyping
- Microbial and viral pathogen detection
- Molecular diagnosis

Products

Cat.No.	Product
BPQL	RealHelix™ *Premier* 2x qPCR Premix [Green, Low ROX]
BPQH	RealHelix™ *Premier* 2x qPCR Premix [Green, High ROX]
BPQUL	RealHelix™ *Premier* 2x qPCR Premix [Green, Low ROX] [UDG System]
BPQUH	RealHelix™ *Premier* 2x qPCR Premix [Green, High ROX] [UDG System]

Data

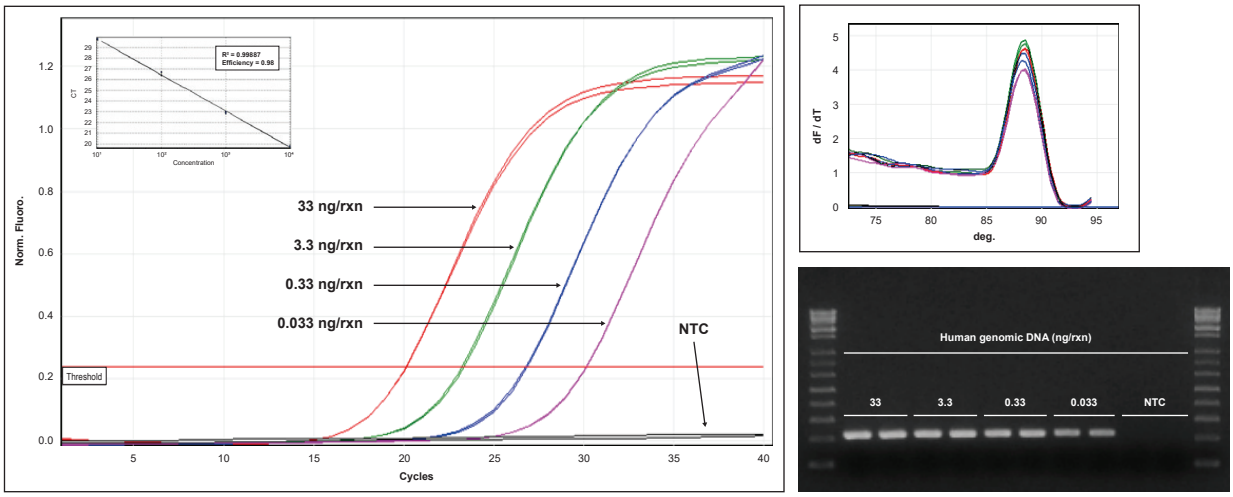


Fig. Sensitive detection using RealHelix™ *Premier* 2x qPCR Premix [Green, Low ROX]
A standard sample of 10-fold serial-diluted genomic DNA was analyzed using the RealHelix™ *Premier* 2x qPCR Premix for the human glucose-6-phosphate dehydrogenase gene-specific primer set. The accuracy of real-time PCR using the RealHelix™ *Premier* 2x qPCR Premix is demonstrated by R² value=0.99887. NTC: No template control.

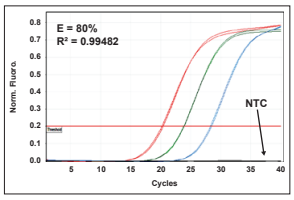
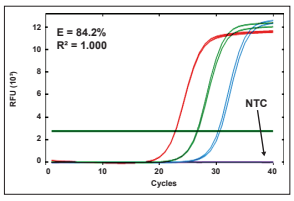
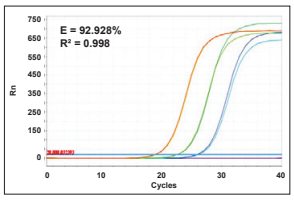
Housekeeping Gene	Template GC(%)	Amplification Data	Real-time PCR Instruments
hHPRT-1 (Hypoxanthine quanine phosphoribosyl transferase 1)	**32.4%**		**Rotor-Gene Q** (QIAGEN, Germany)
hHMBS (Hydroxymethylbilane synthase)	**52.5%**		**CFX-96** (Bio-Rad, USA)
hG6PD (Glucose-6-phosphate dehydrogenase)	**60.4%**		**ABI 7500** (Applied Biosystems, USA)

Fig. Amplification of target DNA with various GC contents using RealHelix™ *Premier* 2x qPCR Premix [Green, Low ROW].
The result of the premix performance using 10x diluted human genomic DNA on each instrument. red: 50 ng/rxn, green: 5 ng/rxn, blue: 0.5 ng/rxn, NTC: No template control.

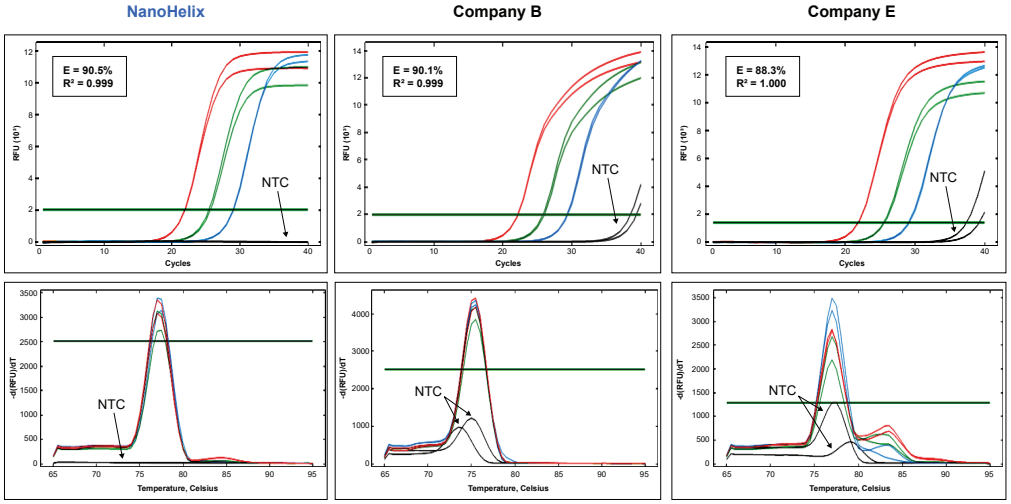


Fig. Comparison of real-time PCR using RealHelix™ *Premier* 2x qPCR Premix [Green] with other company's related products.
10-fold serial dilutions of the human genomic DNA(red: 50 ng/rxn, green: 5 ng/rxn, and blue: 0.5 ng/rxn) from whole blood were analyzed using the human HPRT-1 gene-specific primer set. Reactions were run on a real-time PCR instrument, Bio-Rad CFX96. NTC: No template control.

RealHelix™ Superplex qPCR Premix [Probe]

- ✓ Probe-based real-time PCR reagent
- ✓ Multiplex: Up to 12-plex probe qPCR in a reaction
- ✓ Convenient 2x concentrated premix
- ✓ Specific, sensitive, and reliable
- ✓ Unique buffer system and hot-start enzyme
- ✓ UDG system: prevention of carryover contamination

Description

RealHelix™ Superplex qPCR Premix [Probe] is designed for multiple target qPCR detections using dual-labeled probes in real-time PCR instruments. The user convenient 2x premix contains all required components including a hot-start *Taq* polymerase, heat-labile uracil-DNA glycosylase, dUTP, dNTPs, buffer, Mg^{2+} and stabilizing agents. The hot-start *Taq* polymerase provides high specific amplification of target DNA and minimizes the side products such as primer dimers. This UDG/dUTP system prevents the carryover contamination of PCR products from previous reactions.

Application

- Real-time PCR analysis with labeled-probes
- Multiple target detection and quantification
- FMCA(Fluorescence melting curve analysis)
- FMMA(Fluorescence multiple melting analysis)
- SNP analysis and genotyping
- Microbial and viral pathogen detection
- Molecular diagnosis

Products

Cat.No.	Product
BSUQ	RealHelix™ Superplex qPCR Premix [Probe]

Data

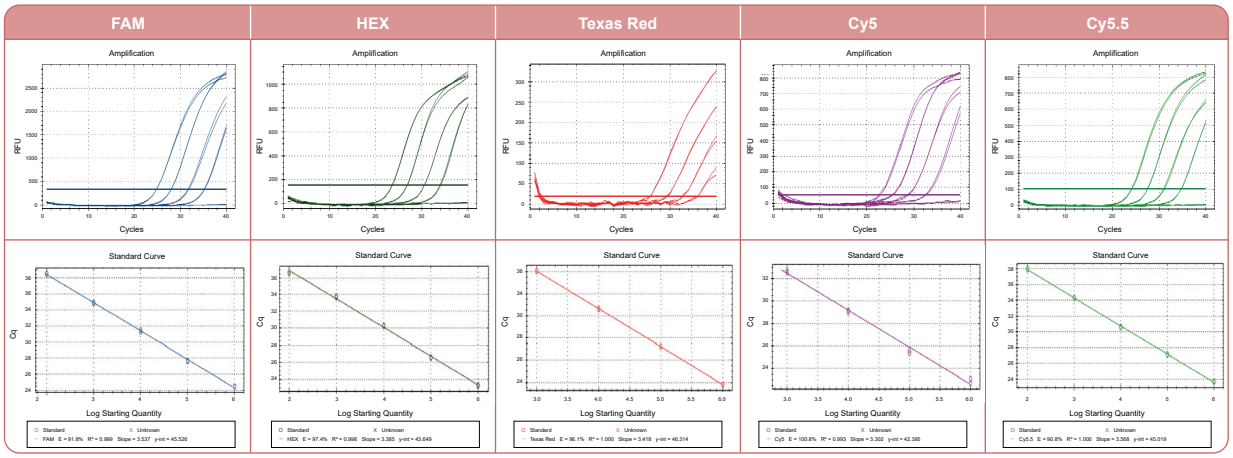


Fig. Multiple amplification of 5 targets in a reaction by RealHelix™ Superplex qPCR Premix [Probe].
5 targets labeled with different fluorescent reporter dyes were analyzed with this RealHelix™ Superplex qPCR Premix [Probe]. Reactions were performed on a real-time PCR instrument, Bio-Rad CFX96.

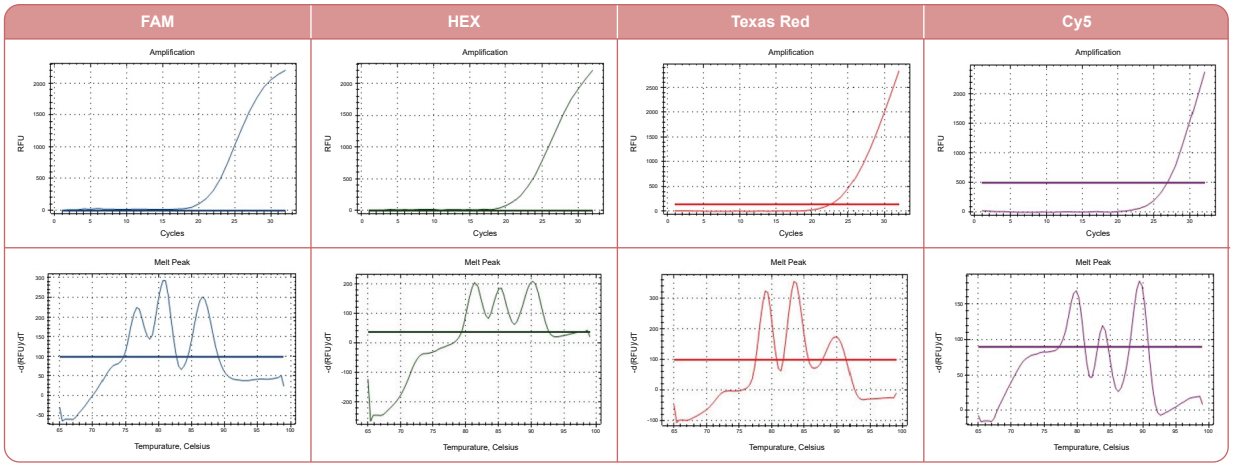


Fig. 12 targets multiplex amplification in a reaction by RealHelix™ Superplex qPCR Premix [Probe].
Using the allele-specific FMMA probes(labeled with FAM, HEX, Texas Red, or Cy5), 12 rice SNP genotypes were identified in a single reaction. A mix of rice genomic DNAs (total 10 ng) was used for the FMMA reaction to detect all of the 12 SNPs screened for determination of rice variants. The multiplex reaction was performed on a real-time PCR instrument, Bio-Rad CFX96.

RealHelix™ Direct qPCR Kit [Probe]

- ✓ Real-time amplification DIRECTLY from various samples
- ✓ Skip DNA purification
- ✓ Applicable with intercalating dyes and probes
- ✓ TIME and COST saving
- ✓ Applicable to point-of-care molecular diagnostics(POC MDx)

Description

RealHelix™ Direct qPCR Kit [Probe] is designed for a probe-based qPCR amplification directly from animal tissues, plant tissues, and various clinical samples including whole blood, serum, urine, hair and swab collections without any DNA purification processes. The 2x Direct qPCR Premix [probe] in this kit contains antibody-inhibited hot-start *Taq* DNA polymerase, dNTPs, $MgCl_2$, stabilizer, and unique buffer system to resist various PCR inhibitors of tissue samples.

Application

- Direct and quantitative real-time PCR

Products

Cat.No.	Product
BDQPR-P	RealHelix™ Direct qPCR Kit [Probe]

Data

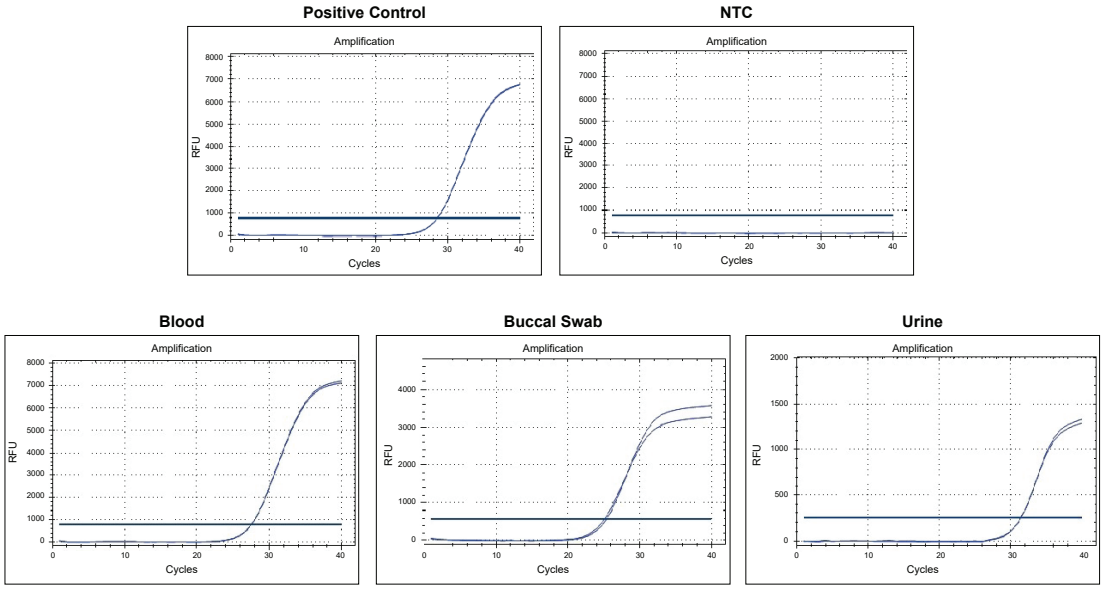


Fig. Real-time PCR using RealHelix™ Direct qPCR Kit [Probe] from various human samples.
The lysates from each sample(whole blood, buccal swab, or urine) were prepared following the protocol. Each 1 µl of lysate and 10 ng of human genomic DNA(positive control) were analyzed using a human beta-globin gene-specific primer set and a probe labeled with FAM on a real-time PCR instrument, Bio-Rad CFX96. Each reaction was duplicated. NTC: No template control.

RealHelix™ Direct qPCR Kit [Green]

- ✓ Real-time amplification DIRECTLY from various samples
- ✓ Skip DNA purification
- ✓ Intercalating dye based qPCR amplification
- ✓ TIME and COST saving
- ✓ Applicable to point-of-care molecular diagnostics(POC MDx)

Description

RealHelix™ Direct qPCR Kit [Green] is designed for an intercalating dye based qPCR amplification directly from animal tissues, plant tissues, and various clinical samples including whole blood, serum, urine, hair and swab collections without any DNA purification processes. The 2x Direct qPCR Premix [Green] in this kit contains antibody-inhibited hot-start *Taq* DNA polymerase, dNTPs, $MgCl_2$, green fluorescent dye, stabilizer, and unique buffer system to resist various PCR inhibitors of tissue samples.

Application

- Direct and quantitative real-time PCR

Products

Cat.No.	Product
BDQPR-S	RealHelix™ Direct qPCR Kit [Green]

Data

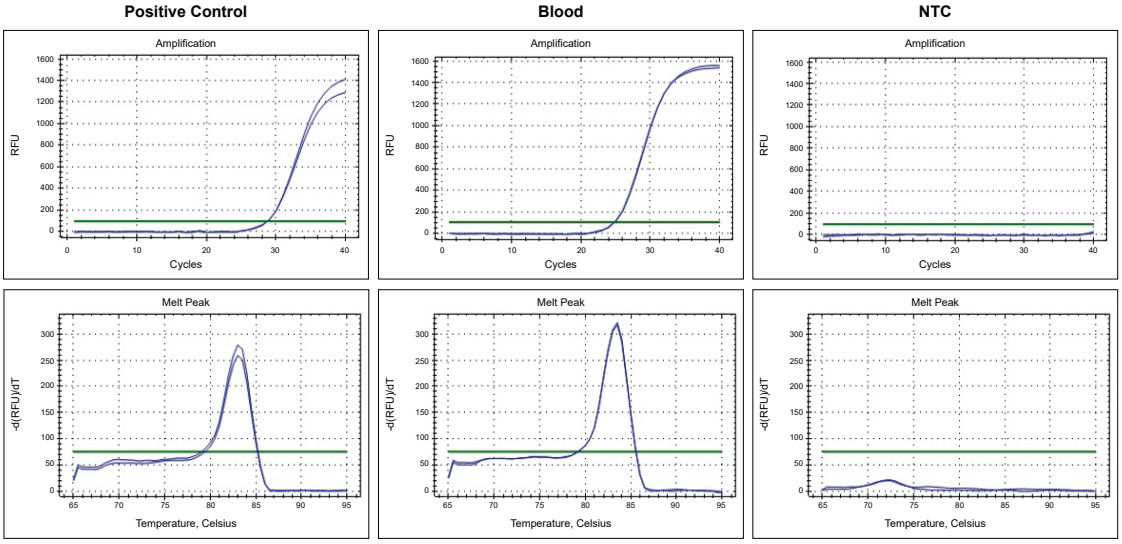


Fig. Real-time PCR using RealHelix™ Direct qPCR Kit [Green] from blood samples.
A lysate of whole blood was prepared following the protocol, and 1 µl of the lysate was used as a template in this reaction containing a green fluorescent dye. 10 ng of human genomic DNA was used for a positive control reaction on a real-time PCR instrument, Bio-Rad CFX96. The amplification curves(upper panels) and melting analysis results(lower panels) are shown. Each reaction was duplicated. NTC: No template control.

Data

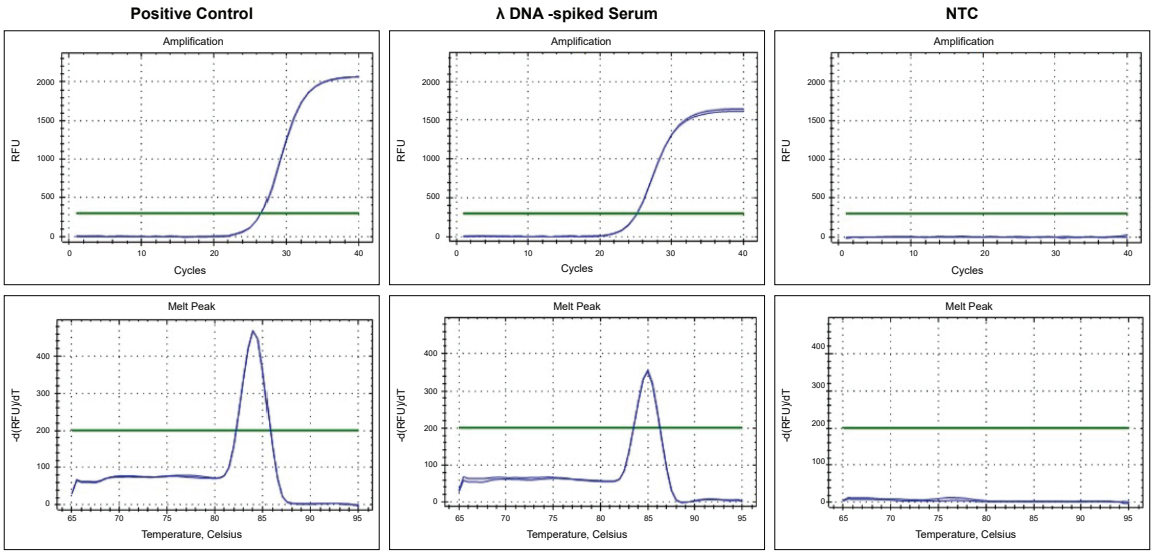


Fig. Real-time PCR using RealHelix™ Direct qPCR Kit [Green] from λ DNA-spiked serum samples.
A lysate from the λ DNA-spiked serum was prepared following the protocol. 1 µl of prepared lysate(test sample) and 1 pg of λ DNA(positive control) were analyzed with a λ DNA-specific primer set and a green fluorescence dye on a real-time PCR instrument, Bio-Rad CFX96. The amplification curves(upper panels) and melting analysis results(lower panels) are shown. Each reaction was duplicated. NTC: No template control.

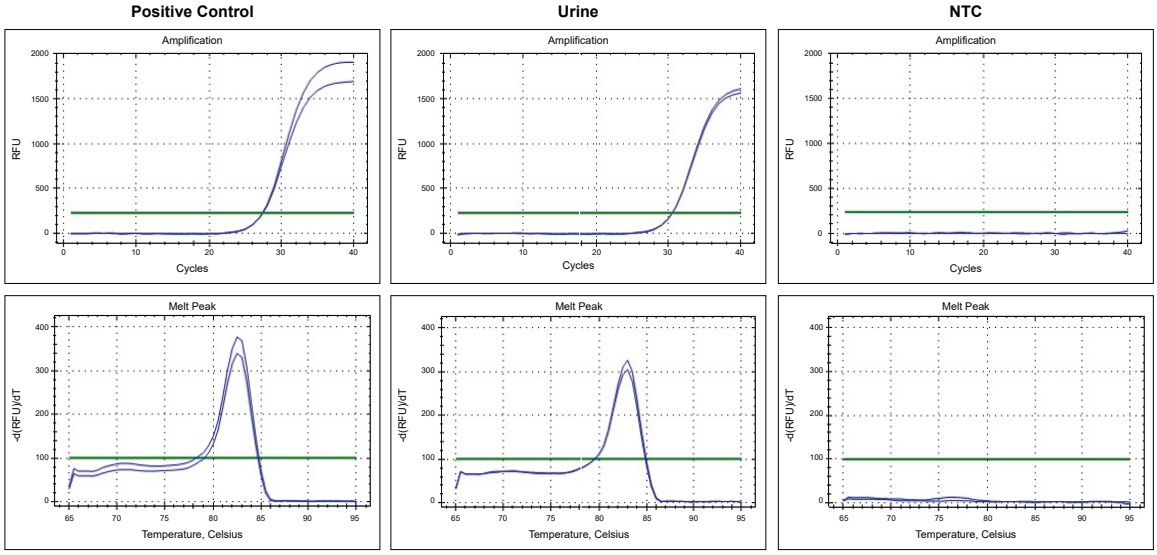


Fig. Real-time PCR using RealHelix™ Direct qPCR Kit [Green] from urine sample.
Cell pellets from 1 ml of urine by centrifugation and PBS-wash were used for the preparation of lysate following the protocol. 1 µl of prepared lysate(test sample) and 10 ng of human genomic DNA(positive control) were analyzed with a human beta-globin gene-specific primer set and a green fluorescence dye. Direct qPCR was performed on a real-time PCR instrument, Bio-Rad CFX96. The amplification curves(upper panels) and melting analysis results(lower panels) are shown. Each reaction was duplicated. NTC: No template control.

Data

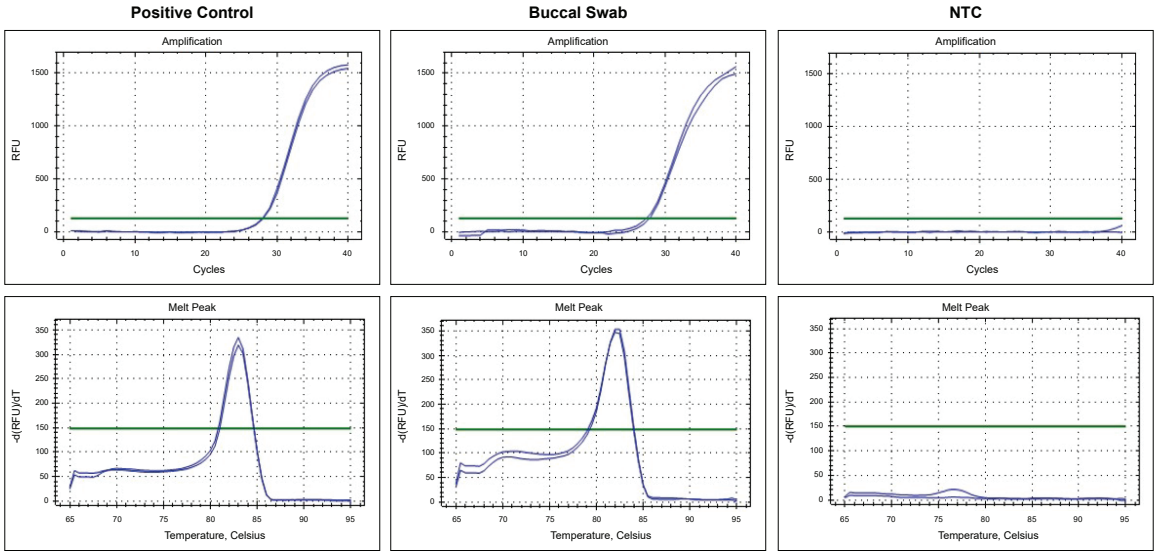


Fig. Real-time PCR using RealHelix™ Direct qPCR Kit [Green] from buccal swab sample.
The lysate was prepared from a tissue sample collected by a buccal swab following the protocol. 1 µl of prepared lysate(test sample) and 10 ng of human genomic DNA(positive control) were analyzed with a human beta-globin gene-specific primer set and a green fluorescent dye on a real-time PCR instrument, Bio-Rad CFX96. The amplification curves(upper panels) and melting analysis results(lower panels) are displayed. Each reaction was duplicated. NTC: No template control.

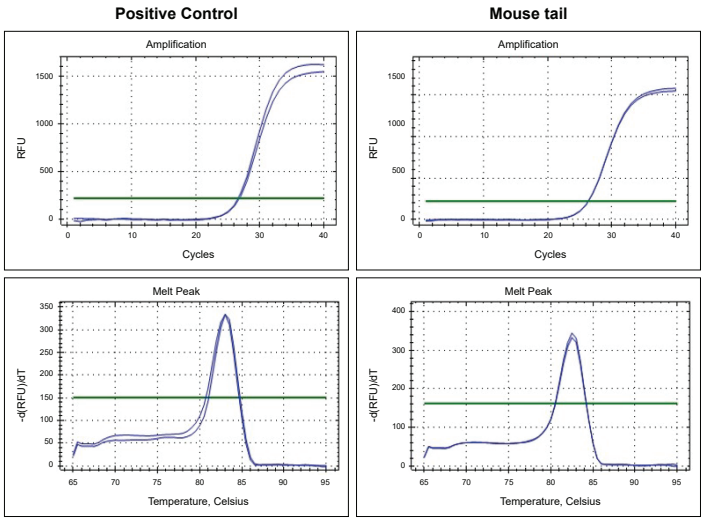


Fig. Real-time PCR using RealHelix™ Direct qPCR Kit [Green] from mouse tail sample.
1 mm of mouse tail was used for the preparation of lysate following the protocol. 1 µl of prepared lysate(test sample) and 10 ng of mouse genomic DNA(positive control) were analyzed with a mouse *Sox21* gene-specific primer set and a green fluorescent dye on a real-time PCR instrument, Bio-Rad CFX96. The amplification curves(upper panels) and melting analysis results(lower panels) are shown. Each reaction was duplicated.

RealHelix™ 2x qPCR Premix [Probe]

- ✓ Probe-based real-time PCR kit
- ✓ Convenient 2x concentrated premix
- ✓ High specificity using *Hot-Taq* polymerase
- ✓ Reduced contamination risk

Description

RealHelix™ 2x qPCR Premix [Probe] is designed to perform a rapid real-time quantification of target DNA using dual-labeled probes. The convenient 2x concentrated premix contains hot-start PCR enzyme, dNTPs, buffers, Mg^{2+}, and stabilizing agent. The hot-start PCR enzyme provides high specific amplification of target DNA and minimizes the non-specific reactions and production of primer dimers. The separately supplied ROX dye could be used as a passive reference dye in real-time PCR instruments that are compatible with the evaluation of the ROX signal.

Application

- Real-time quantification of multiple target DNAs
- Automated high throughput real-time PCR
- Gene expression analysis of cDNA
- SNP analysis and genotyping
- Microbial and viral pathogen detection
- Molecular diagnosis

Products

Cat.No.	Product
BQP2-P	RealHelix™ 2x qPCR Premix [Probe]
BQPU2-P	RealHelix™ 2x qPCR Premix [Probe] [UDG System]

Data

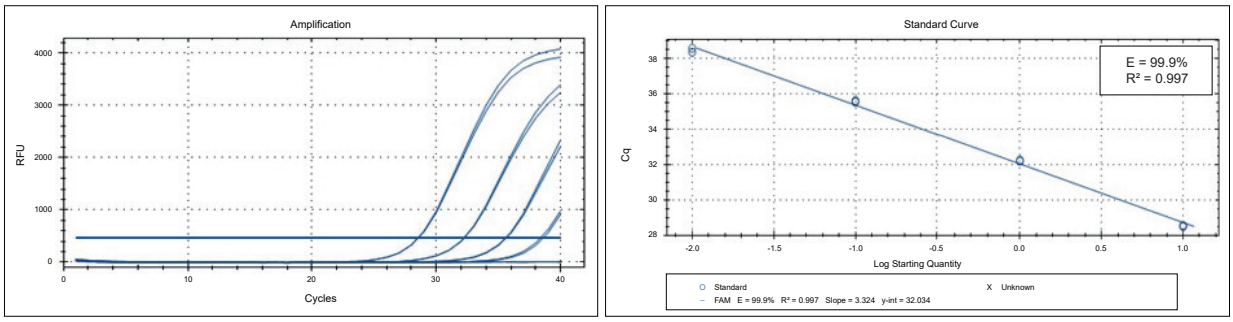


Fig. The accuracy of real-time PCR using RealHelix™ 2x qPCR Premix [Probe].
Human genomic DNAs(10, 1, 0.1, and 0.01 ng) isolated from whole blood were analyzed using the glyceraldehyde-3-phosphate dehydrogenase(GAPDH) gene-specific primer set and 5'-FAM-labelled probe. The accuracy of real-time PCR is demonstrated by E=99.9 %, R² value=0.997. Performed on a Bio-Rad CFX96.

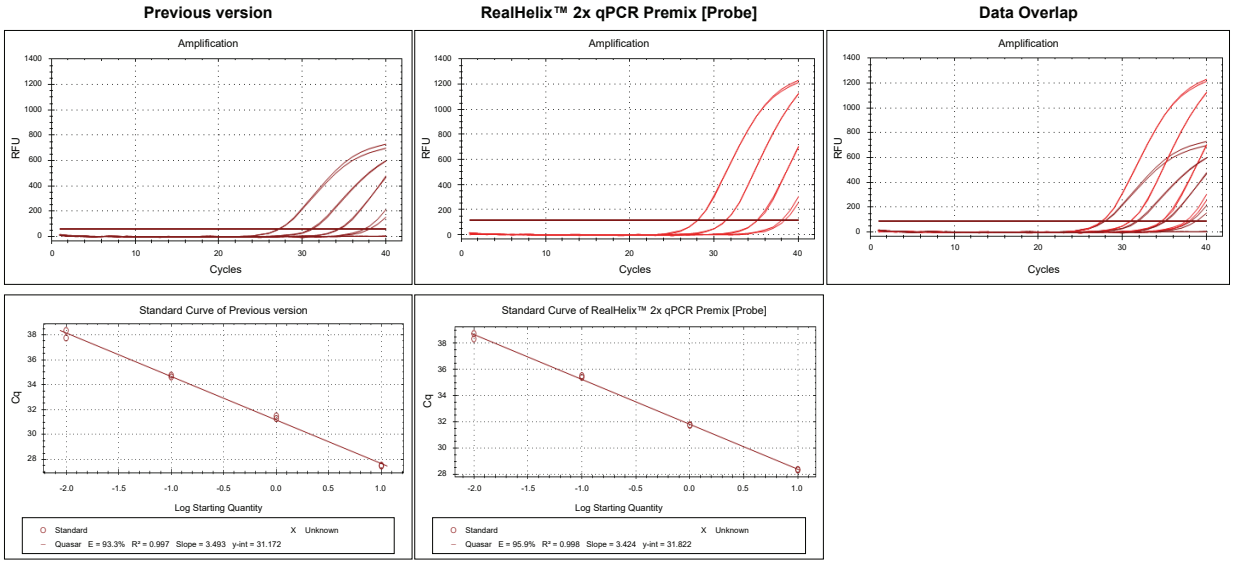


Fig. Comparison of real-time PCR using RealHelix™ 2x qPCR Premix [Probe] and its previous version.
Human genomic DNAs(100, 10, 1, and 0.1 ng) isolated from whole blood were analyzed using the beta-globin gene-specific primer set and 5'-Quasar705-labelled probe. Tests were performed on a Bio-Rad CFX96.

RealHelix™ 2x qPCR Premix [Green]

- ✓ Real-time PCR kit with DNA intercalating fluorescent dye
- ✓ Convenient 2x concentrated premix
- ✓ High specificity using *Hot-Taq* polymerase
- ✓ Reduced contamination risk

Description

RealHelix™ 2x qPCR Premix [Green] is designed to perform a rapid real-time quantification of target DNA using a double strand DNA-binding green fluorescent dye. The convenient 2x premix contains hot-start PCR enzyme, green fluorescent dye, dNTPs, buffers, Mg^{2+}, and stabilizing agent. The hot-start PCR enzyme provides high specific amplification of target DNA and minimizes the side products such as primer dimers. The separately supplied ROX dye could be used as a passive reference dye in real-time PCR instruments that are compatible with the evaluation of the ROX signal.

Application

- Real-time quantification of target DNA
- Automated high throughput real-time PCR
- Gene expression analysis of cDNA
- SNP analysis and genotyping
- Microbial and viral pathogen detection
- Molecular diagnosis

Products

Cat.No.	Product
BQP2-S	RealHelix™ 2x qPCR Premix [Green]
BQPU2-S	RealHelix™ 2x qPCR Premix [Green] [UDG System]

Data

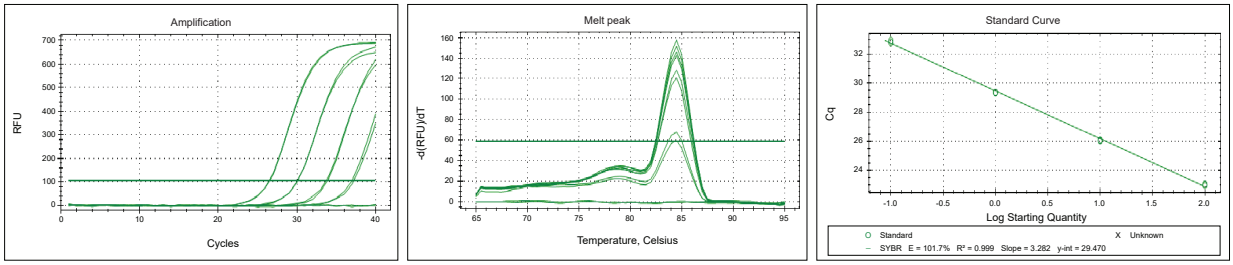


Fig. The accuracy of real-time PCR using RealHelix™ 2x qPCR Premix [Green]
Human genomic DNAs(10, 1, 0.1, and 0.01 ng) isolated from whole blood were analyzed using the alpha 1-antitrypsin(AAT) DNA-specific primer set and a green fluorescent dye. The accuracy of real-time PCR is demonstrated by E=101.7 %, R² value=0.999. The tests were performed on the Bio-Rad CFX96.

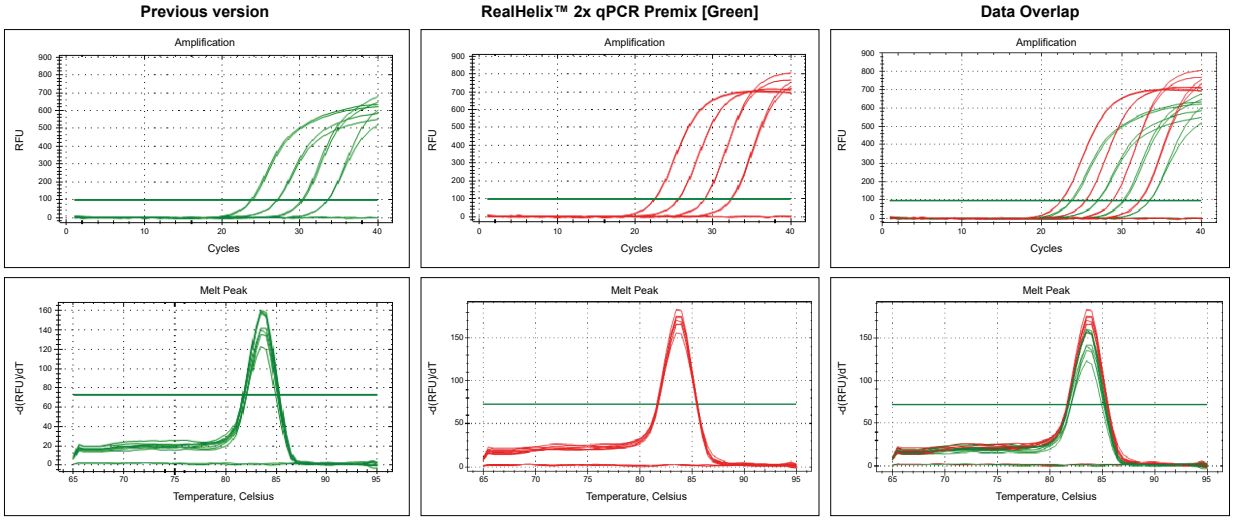


Fig. Comparison of real-time PCR using RealHelix™ 2x qPCR Premix [Green] and the previous version
Human genomic DNAs(100, 10, 1, and 0.1 ng) isolated from whole blood were analyzed using a beta-globin gene-specific primer set and a green fluorescent dye. The tests were performed on the Bio-Rad CFX96.

05

Real-Time RT-PCR Premixes

DirectFast qRT-PCR Kit (V1a)

1-sec qRT-PCR Premix [Probe] (Ver. 2.0)

qRT-PCR Kit [v4] [UDG System]

qRT-PCR Kit [v6a] [UDG System]

qRT-PCR Kit [Probe]

qRT-PCR Kit [Green]

RealHelix™ *DirectFast* qRT-PCR Kit (V1a)

- ✓ **Direct**: RNA extraction-free
- ✓ **Fast**(<45 minutes) or **ultrafast**(<25 minutes) for 40 cycles
- ✓ **Multiplex**: Up to 5-plex probe in a reaction
- ✓ Ab-based hot-start *Taq* / Thermostable RTase
- ✓ UDG system: Carryover contamination prevention

Description

RealHelix™ *DirectFast* qRT-PCR Kit (V1a), a probe-based qRT-PCR kit, is designed for RNA direct real-time amplification from animal tissues, plant tissues, and various clinical samples(including whole blood, serum and swab collections) without any RNA purification processes. This kit allows the fast reaction to complete the qRT-PCR cycles within 1 hour. The enzyme mix in this kit is an optimized blend of reverse transcriptase, antibody-coupled *Taq* DNA polymerase, RNase inhibitor, and a heat-labile uracil-DNA-glycosylase(HL-UDG). The reaction buffer contains all of the required components, including optimized buffer components, Mg^{2+}, dUTP, and dNTPs. The applied HL-UDG/dUTP system eliminates the carryover contamination of PCR products from previous reactions. HL-UDG efficiently removes uracil residues from dU-containing DNA during the PCR mixture setup and handling.

Products

Cat.No.	Product
BDFQRU-A	RealHelix™ *DirectFast* qRT-PCR Kit (V1a)

Data

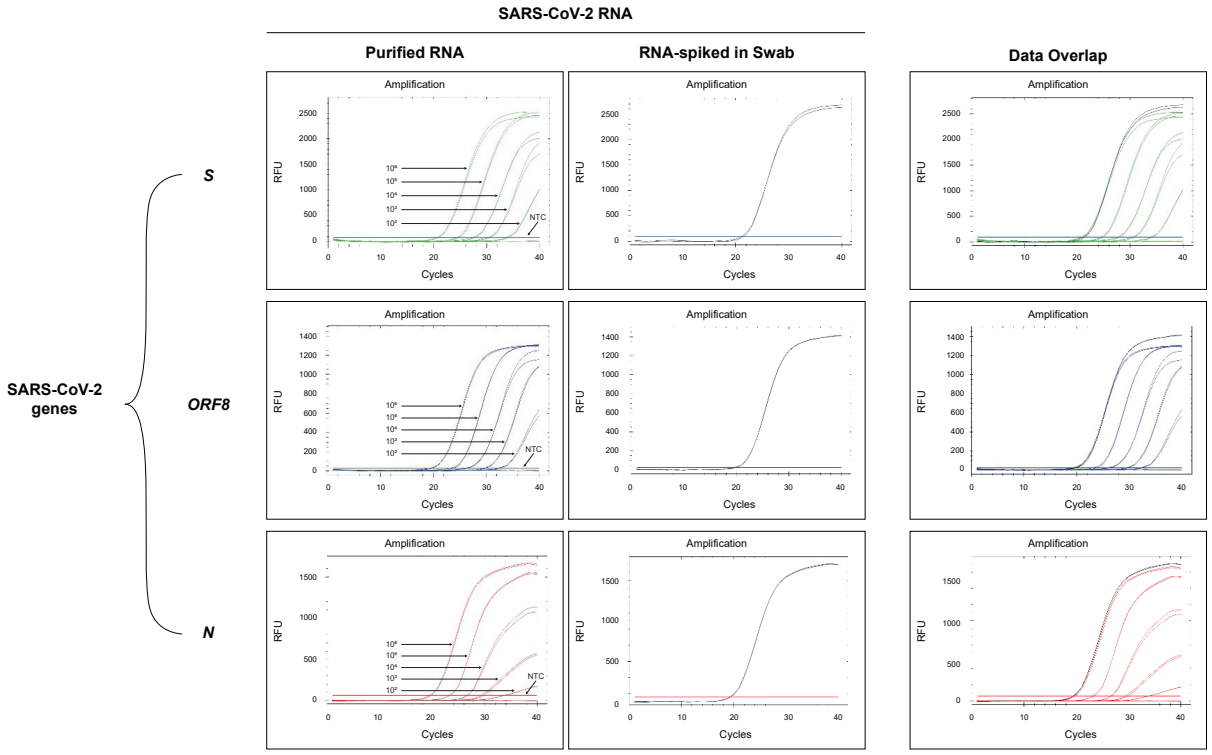
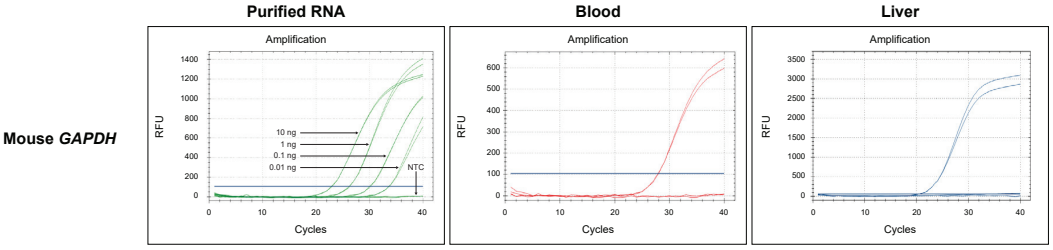


Fig. Direct and multiplex real-time RT-PCR using the RealHelix™ *DirectFast* qRT-PCR Kit (V1a).
Swab lysate spiked with the 10^8 copies of SARS-CoV-2 RNA were prepared following the protocol. 1 µl of the lysate(corresponding to approximately 10^6 copies) and SARS-CoV-2 viral RNA(10^6,10^5,10^4, 10^3, and 10^2 copies) were analyzed using 3 different sets of target-specific primers and probes(*S*, *ORF8*, and *N* gene). The probes were labeled with FAM(*S* gene), HEX(*ORF8*), and Texas Red(*N* gene). The multiplex reaction was tested using the RealHelix™ *DirectFast* qRT-PCR Kit (V1a) on a real-time PCR instrument, Bio-Rad CFX96.



Step	Condition	Cycle(s)
cDNA Synthesis	50°C, 10 min	1
PCR Enzyme Activation	95°C, 3 min	1
PCR Amplification	95°C, 5 sec	40
	60°C, 5 sec	
	72°C, 10 sec (Data collection)	

Fig. Direct and fast real-time RT-PCR using RealHelix™ *DirectFast* qRT-PCR Kit (V1a) from mouse tissues.
The lysates from mouse whole blood or liver were prepared following the protocol. Each 1 µl of lysate and purified total RNA(10, 1, 0.1, and 0.01ng) were analyzed using a mouse *GAPDH* gene-specific primers and probe labeled with FAM on a real-time PCR instrument, Bio-Rad CFX96.

RealHelix™ 1-sec qRT-PCR Premix [Probe] (Ver. 2.0)

- ✓ **Fast**(< 45 minutes) or **ultrafast**(< 25 minutes) for 40 cycles
- ✓ **Multiplex**: Up to 5-plex probes in a reaction
- ✓ Antibody-mediated hot-start *Taq* polymerase
- ✓ UDG system: Prevention of carryover contamination

Description

RealHelix™ 1-sec qRT-PCR Premix [Probe] (Ver. 2.0) is a 2x premix for qRT-PCR assay using fluorescent probe-based detection. This premix effectively delivers reproducible, reliable detection of up to 5 RNA targets by fast multiplex in a single tube reaction(FAST: 45 min/40 cycles or ULTRAFAST: 25 mins/40 cycles). The combination of enzymes(antibody-inhibited hot-start *Taq*, reverse transcriptase, RNase inhibitor) and NanoHelix's unique buffers(including dNTPs, Mg^{2+}, and a stabilizing agent) in the ready-to-use premix provides outstanding speed, specificity, and sensitivity of the real-time assay.

Application

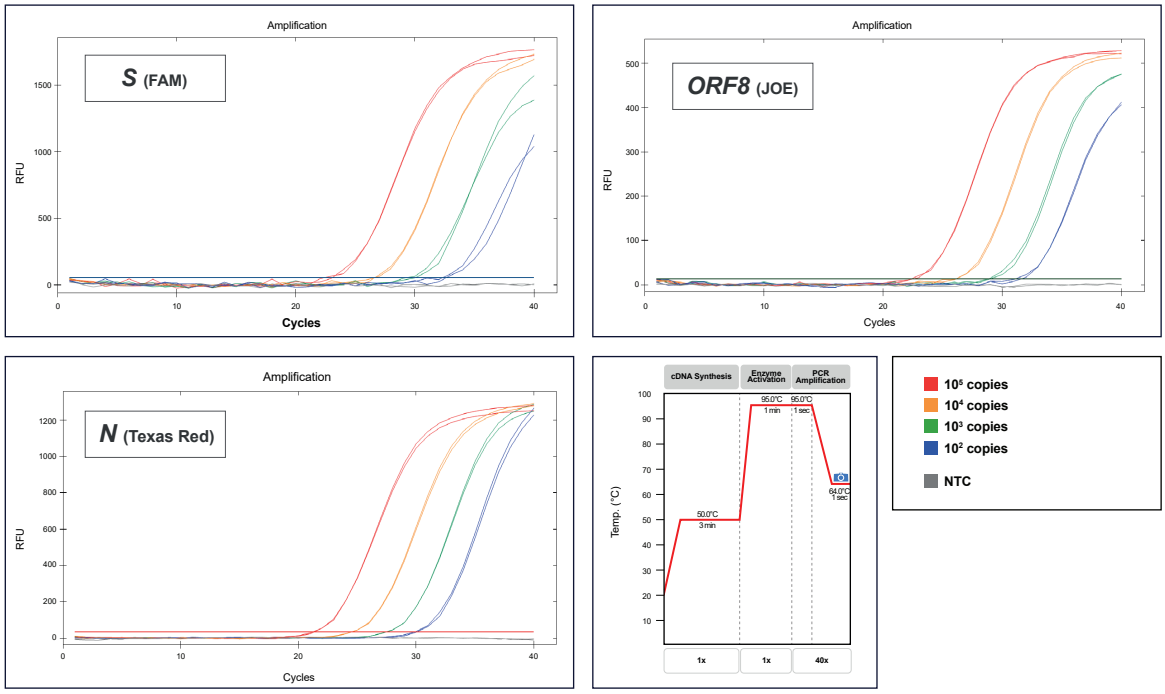
- Fast real-time PCR analysis with labeled-probes
- Multiple target detection and quantification
- SNP analysis and genotyping
- Microbial and viral pathogen detection
- Molecular diagnosis

Products

Cat.No.	Product
BSQR2	RealHelix™ 1-sec qRT-PCR Premix [Probe] (Ver. 2.0)
BSQRU2S	RealHelix™ 1-sec qRT-PCR Kit [Probe] [UDG System] (V2S)

Data

Standard Reaction
45 minutes / 40 cycles
***Instrument:** Bio-Rad CFX96



Ultrafast Reaction
21 minutes / 40 cycles
***Instrument:** QuantStudio 5(Applied Biosystems)

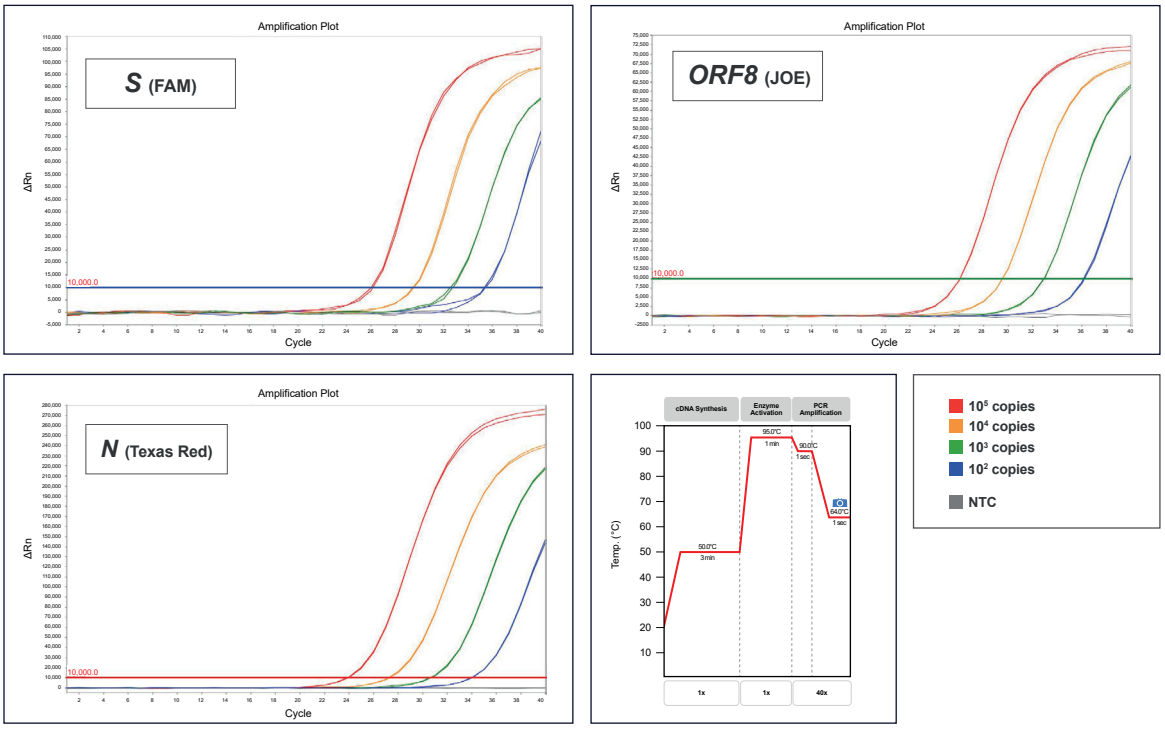


Fig. Fast and multiplex reaction using the RealHelix™ 1-sec qRT-PCR Kit [Probe] (Ver 2.0).
The real-time PCR assay targeted the *S*, *ORF8*, and *N* genes, recognized as conserved regions of SARS-CoV-2. Samples were serially diluted by 10-fold ranging from 10^2 to 10^5 copies. The results of standard reaction(upper panels) and ultrafast reaction(lower panels) are shown. NTC: No template control.

RealHelix™ qRT-PCR Kit [v4] [UDG System]

- ✓ **Multiplex**: Up to 5-plex probe in a reaction
- ✓ High specificity: Chemically-modified hot-start *Taq*
- ✓ Probe based qRT-PCR amplification
- ✓ Consisted of an Enzyme Mix and a 2x Reaction Buffer
- ✓ UDG system: Carryover contamination prevention

Description

RealHelix™ qRT-PCR Kit [v4] [UDG System] is a quantitative RT-PCR reagent that efficiently facilitates reproducible, reliable multiplex detection of up to five RNA targets in a single tube reaction. The enzyme mix is an optimized blend of reverse transcriptase, chemically-modified hot start PCR enzyme, RNase inhibitor protein, and a heat-labile UDG. The 2x reaction buffer contains all required components, including Mg^{2+}, dUTP, and dNTPs. These components help ensure sensitivity, accuracy, and specificity of PCR performance. In addition, carryover-contaminated PCR products can be removed by the applied UDG system.

Application

- Quantification of target RNA by real-time RT-PCR

Products

Cat.No.	Product
BCVQR4	RealHelix™ qRT-PCR Kit [v4] [UDG System]

Data

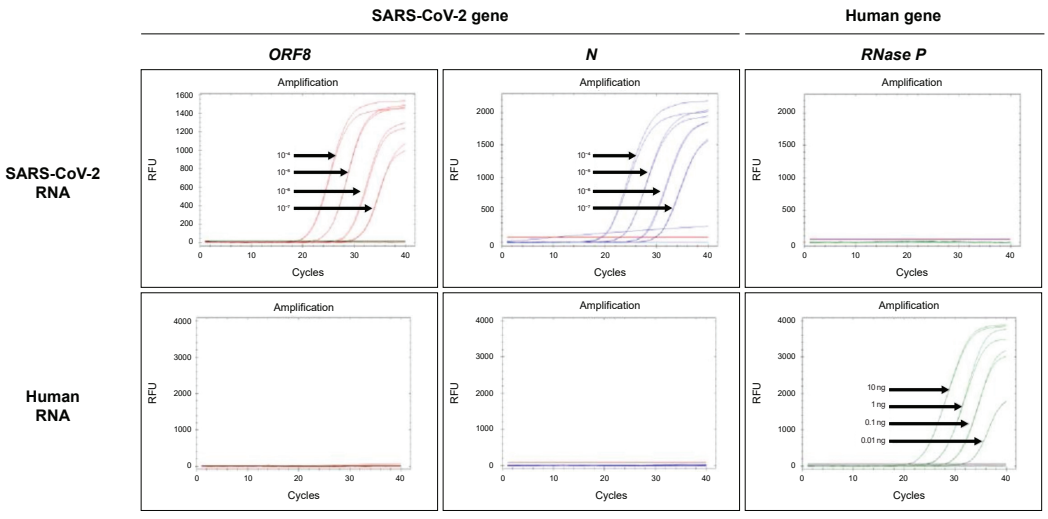


Fig. Multiplex qRT-PCR using the RealHelix™ qRT-PCR Kit [v4] [UDG System].
Purified SARS-CoV-2 viral RNA(dilution fold; 10^{-4}, 10^{-5}, 10^{-6}, 10^{-7}) or human total RNA(10, 1, 0.1, 0.01 ng) were analyzed using three different sets of target-specific primers and probes(*ORF8* and *N* gene from SARS-CoV-2 / *RNase P* gene from human). The probes were labeled with HEX(*ORF8*), Texas Red(*N* gene), or Cy5(*RNase P*). The multiplex reaction was tested using the RealHelix™ qRT-PCR Kit [v4] [UDG System] on a real-time PCR instrument, Bio-Rad CFX96.

RealHelix™ qRT-PCR Kit [v6a] [UDG System]

- ✓ **Fast**(< 45 min) or **ultrafast**(< 25 min) for 40 cycles
- ✓ **Multiplex**: Up to 5-plex probes in a reaction
- ✓ Antibody-mediated hot-start *Taq*
- ✓ Probe based qRT-PCR amplification
- ✓ UDG system: Carryover contamination prevention

Description

RealHelix™ qRT-PCR Kit [v6a] [UDG System] is a probe-based qRT-PCR reagent that efficiently facilitates reproducible, reliable detection of up to five RNA targets by fast multiplex in a single tube reaction(FAST: 45 min/40 cycles or ULTRAFAST: 25 min/40 cycles). The enzyme mix is an optimized blend of reverse transcriptase, antibody-coupled hot-start *Taq* polymerase, RNase inhibitor protein, and a heat-labile UDG. The 5x reaction buffer contains all required components, including Mg^{2+}, dUTP, and dNTPs. These components help ensure sensitivity, accuracy, and specificity in addition to fast PCR performance. The applied UDG system prevents the carryover contamination of products from previous reactions.

Application

- Quantification of target RNA by real-time RT-PCR

Products

Cat.No.	Product
BQR6A	RealHelix™ qRT-PCR Kit [v6a] [UDG System]

Data

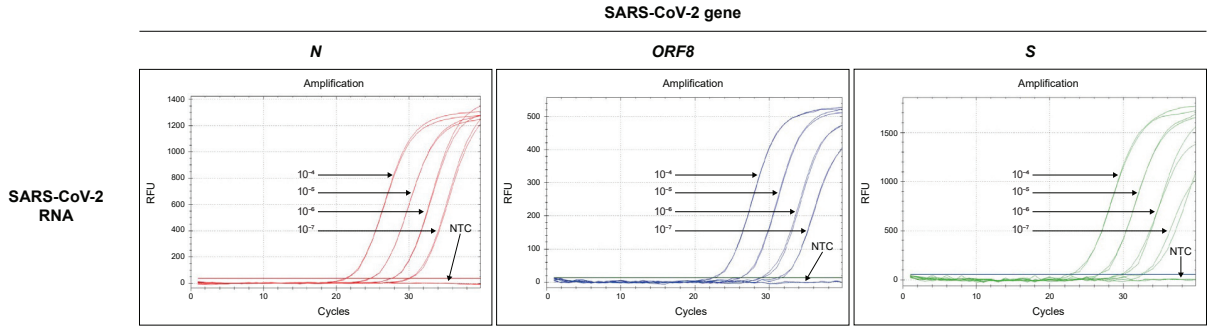


Fig. Multiplex qRT-PCR using the RealHelix™ qRT-PCR Kit [v6a] [UDG System].
10-fold dilutions of purified SARS-CoV-2 viral RNA(from 10^{-4} to 10^{-7}) spiked into a swab sample were analyzed using 3 different sets of target-specific primers and probes(*N*, *ORF8*, and *S* gene). The amount of viral RNA used in the 10^{-7} dilution fold corresponds to approximately 10^2 copies. The probes were labeled with Texas Red(*N* gene), JOE(*ORF8* gene) and FAM(*S* gene). The multiplex reaction was tested using the RealHelix™ qRT-PCR Kit [v6a] [UDG System] on a real-time PCR instrument, Bio-Rad CFX96.

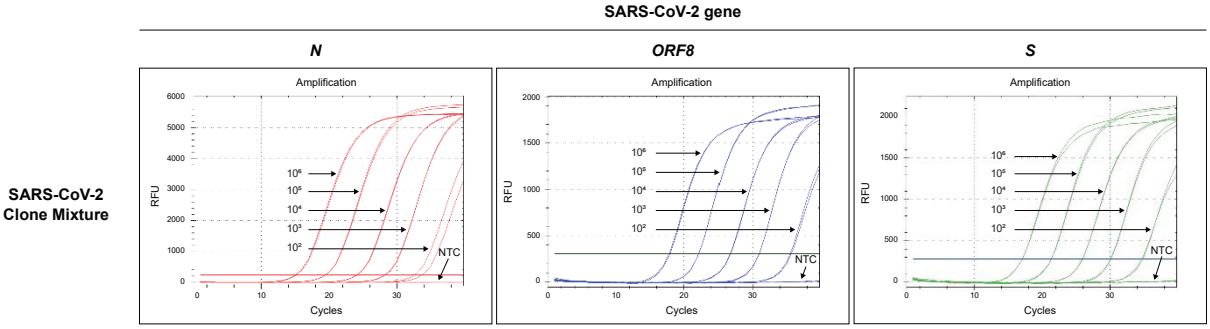


Fig. Multiplex qRT-PCR using the RealHelix™ qRT-PCR Kit [v6a] [UDG System].
Plasmid clone mixtures harboring the partial region for each SARS-CoV-2 were used as templates in this reaction. SARS-CoV-2 clone mixture(10^2 to 10^6 copies) were analyzed using 3 different sets of target-specific primers and probes(*N*, *ORF8* and *S* gene). The probes were labeled with Texas Red(*N* gene), JOE(*ORF8* gene) and FAM(*S* gene). The multiplex reaction was tested on a real-time PCR instrument, Bio-Rad CFX96.

RealHelix™ qRT-PCR Kit [Probe]

- ✓ Sensitive and reliable one-step quantitative RT-PCR kit
- ✓ Detection by sequence-specific probe
- ✓ High specificity using *Hot-Taq* polymerase
- ✓ Separately supplied ROX passive reference dye

Description

RealHelix™ qRT-PCR Kit [Probe] is a convenient and reliable one-step quantitative RT-PCR kit. Both cDNA synthesis and PCR are performed in a single tube using sequence-specific primers corresponding to the target RNAs from total RNA or mRNA. The enzyme mix in this kit is an optimized blend of HelixCript™ *Thermo* Reverse Transcriptase, RNase inhibitor and a specially designed automatic hot-start version of PCR enzyme, and ensures reliable results in terms of sensitivity, accuracy and specificity. The 2x buffer mix contains all of the required components including optimized buffer components, Mg^{2+}, dNTPs. The separately supplied ROX dye could be used as a passive reference dye in real-time PCR instruments that are compatible with the evaluation of the ROX signal.

Application

- Probe-based real-time quantification of target RNA
- Gene expression analysis
- Viral RNA detection
- Molecular diagnosis

Products

Cat.No.	Product
BQRT2-P	RealHelix™ qRT-PCR Kit [Probe]
BQRTU2-P	RealHelix™ qRT-PCR Kit [Probe] [UDG System]

Data

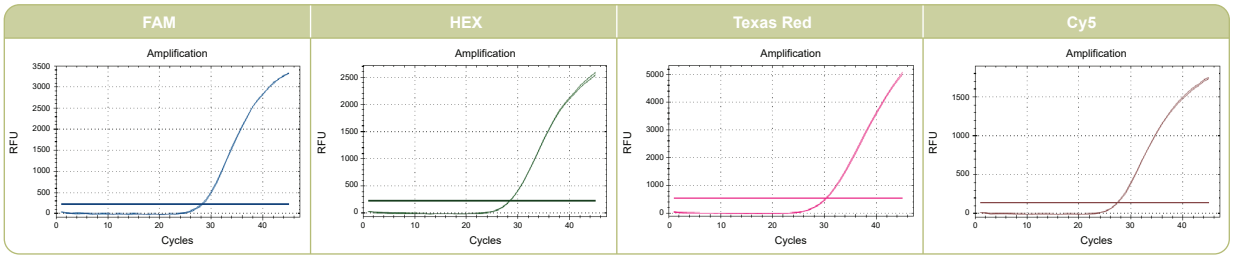


Fig. 4-target qRT-PCR with RealHelix™ qRT-PCR Kit [Probe].
Total RNAs from human whole blood were analyzed using four different sets of target-specific primers and probes. The probes were labeled with FAM, HEX, Texas Red, or Cy5. The multiplex reaction was performed using the RealHelix™ qRT-PCR Kit [Probe] on a real-time PCR instrument, Bio-Rad CFX96.

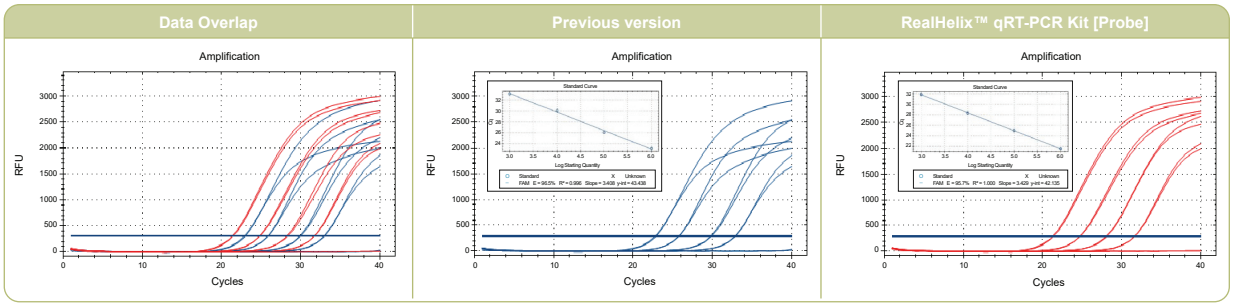


Fig. Comparison of RealHelix™ qRT-PCR Kit [Probe] and previous version.
10-fold serial dilutions(10, 1, 0.1, and 0.01 ng) of the human total RNA from whole blood were analyzed using a human globin gene specific primer set. RealHelix™ qRT-PCR Kit [Probe] shows earlier Ct and more reliable amplifications than the previous version. Reactions were run on a real-time PCR instrument, Bio-Rad CFX96.

RealHelix™ qRT-PCR Kit [Green]

- ✓ Sensitive and reliable one-step quantitative RT-PCR kit
- ✓ Detection by a DNA intercalating fluorescent dye
- ✓ High specificity using *Hot-Taq* polymerase
- ✓ Separately supplied ROX passive reference dye

Description

RealHelix™ qRT-PCR Kit [Green] is a convenient and reliable one-step quantitative RT-PCR kit. Both cDNA synthesis and PCR are performed in a single tube using sequence-specific primers corresponding to the target RNAs from the sample. The enzyme mix in this kit is an optimized blend of reverse transcriptase, hot-start PCR enzyme, and RNase inhibitor protein, which ensures reliable results regarding sensitivity, accuracy, and specificity. The 2x buffer mix contains all of the required components including optimized buffer components, Mg^{2+}, dNTPs, and a green fluorescent dye. The separately supplied ROX dye could be used as a passive reference dye in real-time PCR instruments that are compatible with the evaluation of the ROX signal.

Application

- Real-time quantification of target RNA
- Gene expression analysis
- Viral RNA detection
- Molecular diagnosis

Products

Cat.No.	Product
BQRT2-S	RealHelix™ qRT-PCR Kit [Green]
BQRTU2-S	RealHelix™ qRT-PCR Kit [Green] [UDG System]

Data

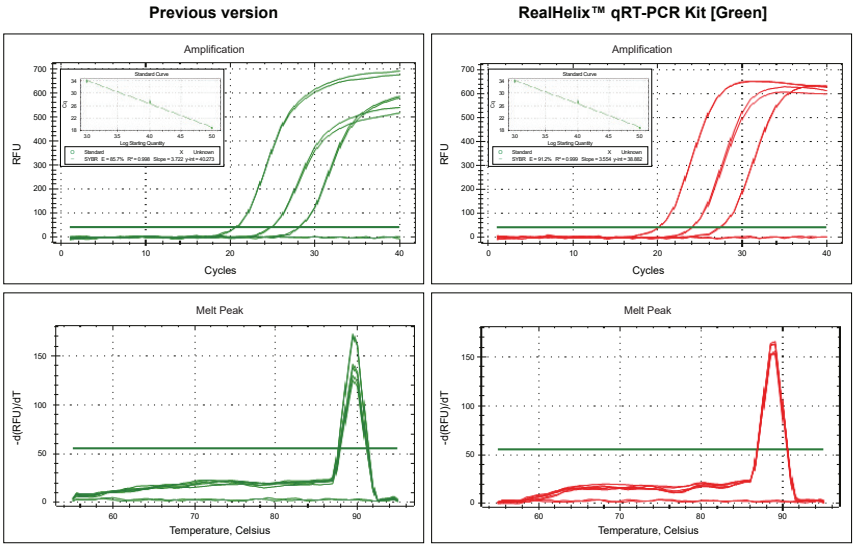


Fig. Comparison of RealHelix™ qRT-PCR Kit [Green] and previous version.
10-fold serial dilutions of the human total RNA(1, 0.1, and 0.01 ng) from whole blood were analyzed using a human beta actin gene-specific primer set. RealHelix™ qRT-PCR Kit [Green] shows more reliable amplifications than our previous version. Reactions were run on a real-time PCR instrument, Bio-Rad CFX96.

06

Isothermal Amplification

FastLAMP Kit (Ver. 2.0)

Fast RT-LAMP Kit (Ver. 2.0)

FastLAMP Kit (Ver. 3.0)

Fast RT-LAMP Kit (Ver. 3.0)

Bst DNA Polymerase, LF (Ver. 3.0)

HelixAmp™ FastLAMP Kit (Ver. 2.0)

- ✓ Fast detection(< 20 minutes) for DNA target
- ✓ Sensitive and accurate
- ✓ Flexible detection method: Endpoint and real-time
- ✓ *Bst* DNA polymerase-based isothermal amplification
- ✓ Applicable to point-of-care molecular diagnostics(POC MDx)

Description

HelixAmp™ FastLAMP Kit (Ver. 2.0) provides simple and fast(within 20 minutes) target DNA amplification using loop-mediated isothermal amplification(LAMP). This kit consists of 5x FastLAMP Buffer V2 (Mg-free), FastLAMP Enzyme V2, 100mM $MgSO_4$ and a D-Solution. The 5x FastLAMP Buffer V2 (Mg-free), optimized for fast amplification, contains buffering reagents, dNTPs, and salts. The FastLAMP Enzyme V2 is composed of a newly engineered *Bst* DNA polymerase that provides improved amplification reaction properties. The novel *Bst* DNA polymerase enhances the DNA polymerization speed and allows the fast isothermal amplification reaction.

Application

- Loop-mediated isothermal amplification (LAMP)

Products

Cat.No.	Product
BFLMP2	HelixAmp™ FastLAMP Kit (Ver. 2.0)

Data

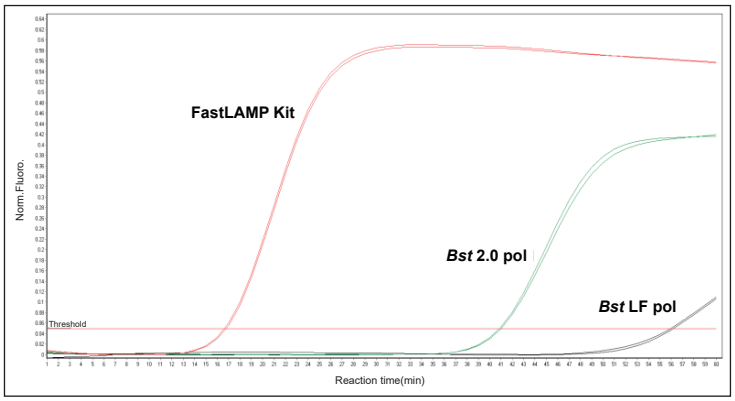


Fig. Real-time fluorescence LAMP assays of HelixAmp™ FastLAMP Kit (Ver. 2.0) compared with other company's products.
20 copies of λ DNA was amplified using 3 type of kit. Reaction were performed using 0.2x EvaGreen intercalating dye on a real-time PCR instrument, Bio-Rad CFX96.

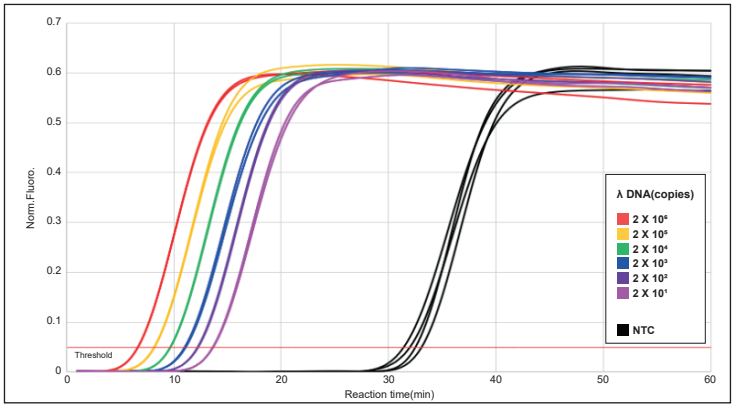


Fig. Sensitivity of HelixAmp™ FastLAMP Kit (Ver. 2.0).
Sensitivity test was performed using λ DNA serially diluted by 10-fold ranging from $2x10^1$ to $2x10^6$ copies. Reactions were performed using 0.2x EvaGreen intercalating dye on a real-time PCR instrument, Bio-Rad CFX96. NTC: No template control.

HelixAmp™ Fast RT-LAMP Kit (Ver. 2.0)

- ✓ Fast detection(< 20 minutes) for RNA target
- ✓ Sensitive and accurate
- ✓ Flexible detection method: Endpoint and real-time
- ✓ *Bst* DNA polymerase-based isothermal amplification
- ✓ Applicable to point-of-care molecular diagnostics(POC MDx)

Description

HelixAmp™ Fast RT-LAMP Kit (Ver. 2.0) provides simple and fast(within 20 minutes) target RNA amplification using loop-mediated isothermal amplification(LAMP). This kit consists of a 5x RT-LAMP Buffer V2 (Mg-free), 100mM $MgSO_4$ and a RT-LAMP Enzyme V2. The 5x RT-LAMP Buffer V2 (Mg-free), optimized for fast amplification, contains buffering reagents, dNTPs, and salts. The RT-LAMP Enzyme V2 is a blend of engineered *Bst* DNA polymerase, thermostable reverse transcriptase(RTase), and RNase inhibitor. The novel *Bst* DNA polymerase enhances the DNA polymerization speed and allows the fast isothermal amplification reaction. The thermostable RTase is fully active at a relatively high temperature (60°C) and it makes possible the one-step RT-LAMP in a constant reaction temperature.

Application

- Reverse transcription loop-mediated isothermal amplification(RT-LAMP)

Products

Cat.No.	Product
BFRLMP2	HelixAmp™ Fast RT-LAMP Kit (Ver. 2.0)

Data

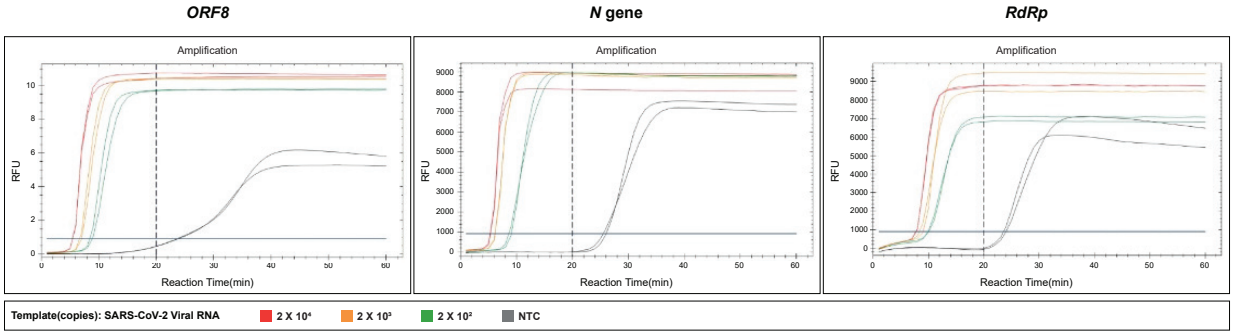


Fig. Real-time RT-LAMP test.
Serially-diluted SARS-CoV-2 RNAs were analyzed using Fast RT-LAMP Kit, each target-specific LAMP primer set at 50°C for 10 minutes and at 60°C for 60 minutes in 25 µl reaction volume. All targets were detected at 2x10² copies by intercalating dye(0.2x EvaGreen) and amplified within 20 minutes including RT incubation time. NTC was not amplified within 20 minutes. NTC: No template control.

HelixAmp™ FastLAMP Kit (Ver. 3.0)

- ✓ Lightning-fast amplification: 8 minutes to threshold
- ✓ Unparalleled sensitivity: As few as 10 to 50 copies of the target DNA in a reaction
- ✓ Unmatched specificity: Guarantee clear differentiation from background amplifications
- ✓ Ensuring accurate and reliable results: Experience next-level isothermal amplifications
- ✓ Applicable to point-of-care molecular diagnostics(POC MDx)

Description

HelixAmp™ FastLAMP Kit (Ver. 3.0) provides simple and fast(within 20 minutes) target DNA amplification using loop-mediated isothermal amplification(LAMP). Especially this kit suppress non-specific product formation in isothermal amplification. Kit contents consists 5x FastLAMP buffer V3 (Mg-free), FastLAMP Enzyme V3, 100mM $MgSO_4$ and a D-Solution. The 5x FastLAMP Buffer V3 (Mg-free), optimized for fast amplification, contains buffering reagents, dNTPs, and salts. The FastLAMP Enzyme V3 is composed of a newly engineered *Bst* DNA polymerase that provides improved amplification reaction properties. The novel *Bst* DNA polymerase enhances the DNA polymerization speed and allows the fast isothermal amplification reaction.

Application

- Loop-mediated isothermal amplification(LAMP)

Products

Cat.No.	Product
BFLMP3	HelixAmp™ FastLAMP Kit (Ver. 3.0)

Data

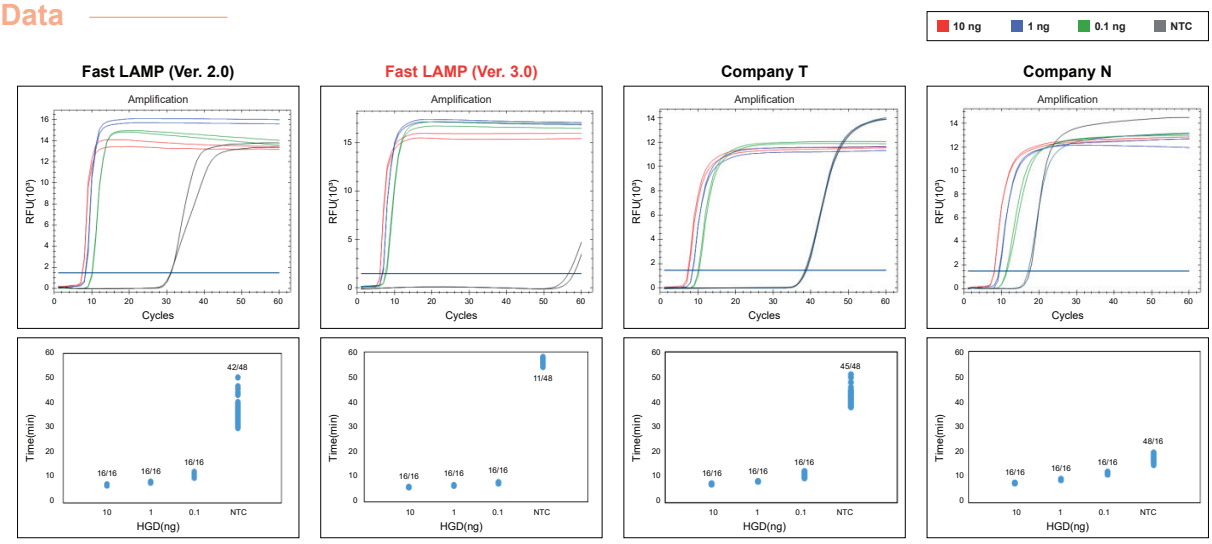


Fig. A comparative analysis of HelixAmp™ FastLAMP Kit (Ver. 3.0) and a competing company's LAMP product.
Real-time isothermal amplifications of the *BRCA* gene were conducted from serially diluted human genomic DNA. The reactions were carried out at 65°C for 60 minutes and analyzed using a real-time instrument(Bio-Rad CFX96) by monitoring fluorescence signals. The kit exhibited exceptional results, demonstrating both the fastest amplification and the highest level of specificity. NTC: No template control.

HelixAmp™ Fast RT-LAMP Kit (Ver. 3.0)

- ✓ The fastest one-step RNA amplification: 8 minutes to threshold
- ✓ Unparalleled sensitivity: As few as 10 to 50 copies of the target RNA in a reaction
- ✓ Unmatched specificity: Guarantee clear differentiation from background amplifications
- ✓ Ensuring accurate and reliable results: Experience next-level isothermal amplifications
- ✓ Applicable to point-of-care molecular diagnostics(POC MDx)

Description

HelixAmp™ Fast RT-LAMP Kit (Ver. 3.0) provides simple and fast(within 20 minutes) amplification of target RNA/DNA through loop-mediated isothermal amplification(LAMP). Especially, this kit effectively mitigates non-specific product formation during isothermal amplification. The components include a 5x RT-LAMP Buffer V3 (Mg-free), 100mM $MgSO_4$ and a RT-LAMP E.M V3. The 5x RT-LAMP Buffer V3 (Mg-free), optimized for fast amplification, comprises buffering reagents, dNTPs, and salts. The RT-LAMP E.M V3 is a blend of engineered *Bst* DNA polymerase, thermostable reverse transcriptase(RTase), and RNase inhibitor. The novel *Bst* DNA polymerase enhances the DNA polymerization speed and allows the fast isothermal amplification reaction. The thermostable RTase maintains full activity at a relatively high temperature(60°C), enabling one-step RT-LAMP in a constant

Application

- Reverse transcription loop-mediated isothermal amplification(RT-LAMP)

Products

Cat.No.	Product
BFRLMP3	HelixAmp™ Fast RT-LAMP Kit (Ver. 3.0)

Data

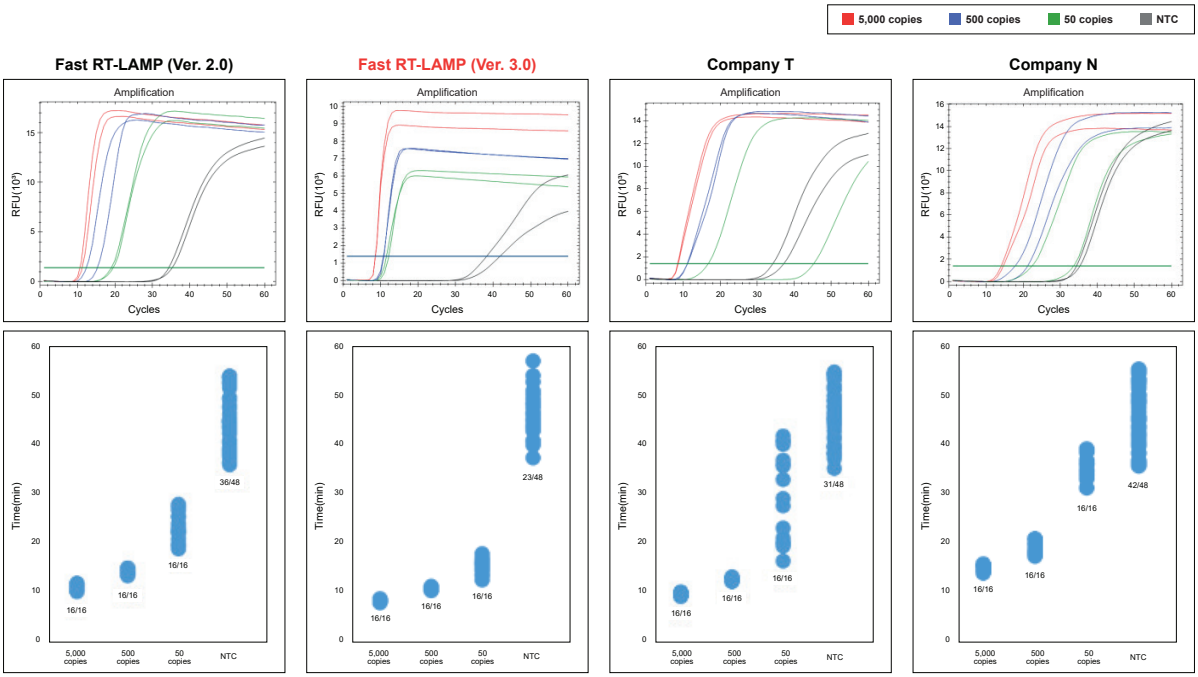


Fig. Comparison of real-time RT-LAMP test.
Serially diluted SARS-CoV-2 RNAs were analyzed using HelixAmp™ Fast RT-LAMP Kit (Ver. 3.0), and other company products. Reactions were incubated at 60°C for 60 minutes and monitored with LAMP fluorescence dye in the SYBR®/FAM channel of Bio-Rad CFX96. NTC: No template control.

HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0)

- ✓ Thermophilic DNA polymerase
- ✓ Strong strand displacement activity
- ✓ Lacks 5' → 3' exonuclease activity
- ✓ A recombinant protein, expressed in *E. coli*

Description

HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0) is the genetically engineered form of the *Bacillus stearothermophilus* DNA polymerase protein that has significantly improved performance. HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0) is prepared from an *E. coli* strain containing the *Bacillus stearothermophilus* DNA polymerase gene, lacking the 5' → 3' exonuclease domain.

Application

- Isothermal amplification
- Strand displacement amplification
- DNA sequencing through high GC content regions

Products

Cat.No.	Product	Feature
B8BST3	HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0)	8 units/μl
B50BST3	HelixAmp™ *Bst* DNA Polymerase, LF (Ver. 3.0)	50 units/μl
B50BST3GF	HelixAmp™ *Bst* DNA Polymerase, (LF, Glycerol-free) (Ver. 3.0)	50 units/μl

07

Lyophilized Premixes

Lyophilized qPCR Premix

Lyophilized qRT-PCR Premix

Lyophilized LAMP Premix

Lyophilized RT-LAMP Premix

Lyophilized LAMP Premix (V3)

Lyophilized RT-LAMP Premix (V3)

RealHelix™ Lyophilized qPCR Premix

- ✓ Ready-to-use formulation
- ✓ Streamlined setup and workflow
- ✓ Long-term stability and storage
- ✓ Simplified logistics and reduced cost
- ✓ 8-strip tube type
- ✓ UDG System: Prevention of carryover contamination

Description

RealHelix™ Lyophilized qPCR Premixes are freeze-dried master mixes including DNA polymerase, dNTPs, salts, and other essential components. These premixes are offered in two variants tailored to different detection methods: intercalating dye-based and probe-based detection. They are available in cake(Lyo-Cake) or bead(Lyo-Dot) format, allowing for ambient/room temperature shipping and storage prior to use.

Application

- Intercalating dye based qPCR amplification
- Probe based qPCR amplification

Products

Feature		Cat.No.	Product	Size
Probe type	Lyo-Cake	LDFQP-C96	RealHelix™ qPCR Lyo-Cake [Probe]	96 rxns
		LDFQP-C480	RealHelix™ qPCR Lyo-Cake [Probe]	480 rxns
		LDFQPU-C96	RealHelix™ qPCR Lyo-Cake [Probe] [UDG System]	96 rxns
		LDFQPU-C480	RealHelix™ qPCR Lyo-Cake [Probe] [UDG System]	480 rxns
	Lyo-Dot	LDFQP-B96	RealHelix™ qPCR Lyo-Dot [Probe]	96 rxns
		LDFQPU-B96	RealHelix™ qPCR Lyo-Dot [Probe] [UDG System]	96 rxns
Intercalating type	Lyo-Cake	LDFQP-G96	RealHelix™ qPCR Lyo-Cake [Green]	96 rxns
		LDFQP-G480	RealHelix™ qPCR Lyo-Cake [Green]	480 rxns
		LDFQPU-G96	RealHelix™ qPCR Lyo-Cake [Green] [UDG System]	96 rxns
		LDFQPU-G480	RealHelix™ qPCR Lyo-Cake [Green] [UDG System]	480 rxns

Data

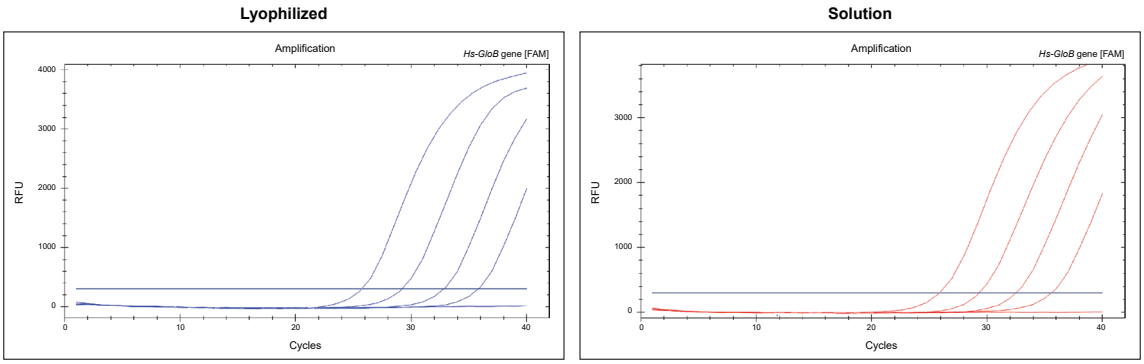


Fig. Comparison of lyophilized qPCR premix and solution type product.
Hs-GloB gene fragment was amplified from 10-fold serial dilutions of human genomic DNA(30 ng ~ 0.03 ng) using lyophilized qPCR premix and solution type qPCR premix under the same condition. Reactions were run on a real-time PCR instrument, Bio-Rad CFX-96.

RealHelix™ Lyophilized qRT-PCR Premix

- ✓ Ready-to-use formulation
- ✓ Streamlined setup and workflow
- ✓ Long-term stability and storage
- ✓ Simplified logistics and reduced cost
- ✓ 8-strip tube type
- ✓ UDG System: Prevention of carryover contamination

Description

RealHelix™ Lyophilized qRT-PCR Premixes are freeze-dried master mixes including antibody-inhibited hot-start *Taq* DNA polymerase, reverse transcriptase, RNase inhibitor, dNTPs, Mg^{2+}, salts, and other essential components. They are available in cake(Lyo-Cake) or bead(Lyo-Dot) format, allowing for ambient/room temperature shipping and storage prior to use.

Application

- Probe based qRT-PCR amplification

Products

Feature	Cat.No.	Product	Size
Lyo-Cake	LDFQR-C96	RealHelix™ qRT-PCR Lyo-Cake [Probe]	96 rxns
	LDFQR-C480	RealHelix™ qRT-PCR Lyo-Cake [Probe]	480 rxns
	LDFQRU-C96	RealHelix™ qRT-PCR Lyo-Cake [Probe] [UDG System]	96 rxns
	LDFQRU-C480	RealHelix™ qRT-PCR Lyo-Cake [Probe] [UDG System]	480 rxns
Lyo-Dot	LDFQR-B96	RealHelix™ qRT-PCR Lyo-Dot [Probe]	96 rxns
	LDFQRU-B96	RealHelix™ qRT-PCR Lyo-Dot [Probe] [UDG System]	96 rxns

Data

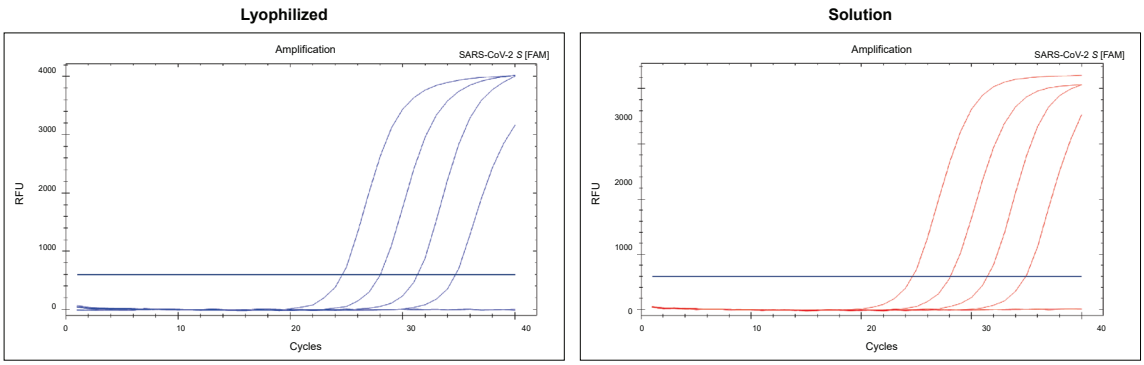


Fig. Comparison of lyophilized qRT-PCR premix and solution type product.
SARS-CoV-2 *S* gene fragment was amplified from 10-fold serially diluted SARS-CoV-2 viral RNA($3x10^4$ to $3x10^1$ copies) using lyophilized qRT-PCR premix and solution type qRT-PCR premix under the same condition. Reactions were run on a real-time PCR instrument, Bio-Rad CFX-96.

HelixAmp™ Lyophilized LAMP Premix

- ✓ Ready-to-use formulation
- ✓ Streamlined setup and workflow
- ✓ Long-term stability and storage
- ✓ Simplified logistics and reduced cost
- ✓ Minimized sample contamination
- ✓ 8-strip tube type

Description

HelixAmp™ Lyophilized LAMP Premixes are lyophilized reagents that provide a one-step approach to loop-mediated isothermal amplification(LAMP) of DNA targets. They contain engineered *Bst* DNA polymerase, dNTPs, Mg^{2+}, salts, and other essential components. This kit allows the fast amplification of the target within 30 minutes with an appropriate LAMP primer set. Available in either cake(Lyo-Cake) or bead(Lyo-Dot) format, these premixes can be shipped and stored at ambient/room temperature, ensuring ease of handling and stability until required for use.

Application

- Loop-mediated isothermal amplification(LAMP)
- Both end-point assay and real-time assay

Products

Feature	Cat.No.	Product	Size
Lyo-Cake	LFLP-C96	HelixAmp™ FastLAMP Lyo-Cake	96 rxns
	LFLP-C480	HelixAmp™ FastLAMP Lyo-Cake	480 rxns
Lyo-Dot	LFLP-B96	HelixAmp™ FastLAMP Lyo-Dot	96 rxns

Data

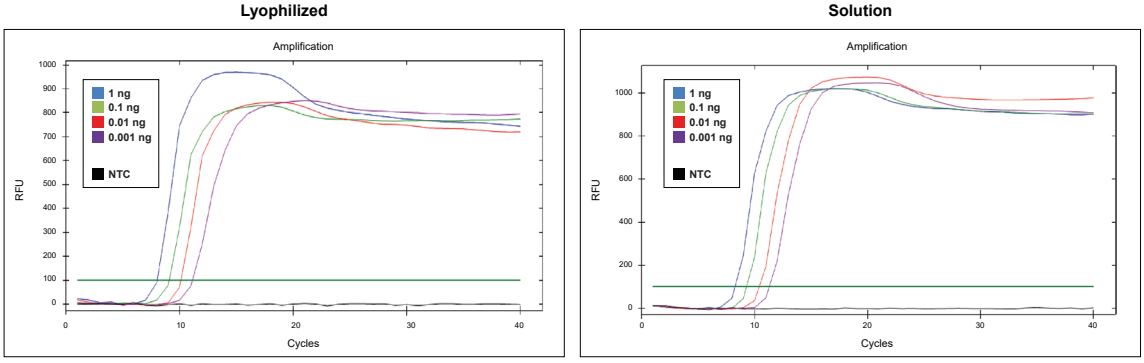


Fig. Comparison of lyophilized FastLAMP premix and solution type product.
Comparison test was performed using λ DNA serially diluted by 10-fold ranging from 1 to 0.001 ng. Reactions were performed using 0.2x EvaGreen intercalating dye on a real-time PCR instrument, Bio-Rad CFX96. NTC: No template control.

HelixAmp™ Lyophilized RT-LAMP Premix

- ✓ Ready-to-use formulation
- ✓ Streamlined setup and workflow
- ✓ Long-term stability and storage
- ✓ Simplified logistics and reduced cost
- ✓ Minimized sample contamination
- ✓ 8-strip tube type

Description

HelixAmp™ Lyophilized RT-LAMP Premixes are lyophilized reagents that provide a one-step approach to loop-mediated isothermal amplification(LAMP) of RNA targets. They contain engineered *Bst* DNA polymerase, thermo-stable reverse transcriptase(RTase), RNase inhibitor, dNTPs, Mg^{2+}, salts, and other essential components.

This kit allows the fast amplification of the target within 30 minutes with an appropriate LAMP primer set. The thermo-stable RTase is fully active at a relatively high temperature(60°C), making the one-step RT-LAMP possible at a constant reaction temperature. Available in either cake(Lyo-Cake) or bead(Lyo-Dot) format, these premixes can be shipped and stored at ambient/room temperature, ensuring ease of handling and stability until required for use.

Application

- Reverse transcription loop-mediated isothermal amplification(RT-LAMP)
- Both end-point assay and real-time assay

Products

Feature	Cat.No.	Product	Size
Lyo-Cake	LFRLP-C96	HelixAmp™ Fast RT-LAMP Lyo-Cake	96 rxns
	LFRLP-C480	HelixAmp™ Fast RT-LAMP Lyo-Cake	480 rxns
Lyo-Dot	LFRLP-B96	HelixAmp™ Fast RT-LAMP Lyo-Dot	96 rxns

Data

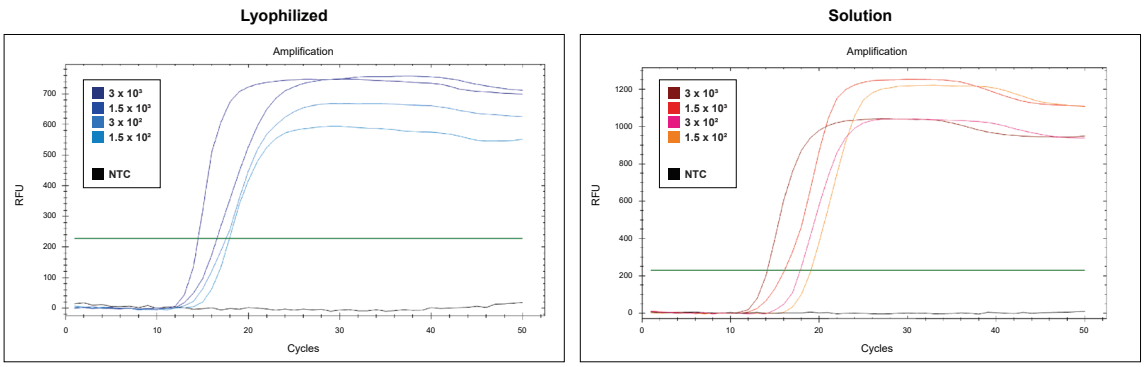


Fig. Comparison of lyophilized Fast RT-LAMP premix and solution type product.
Comparison test was performed using SARS-CoV-2 viral RNA serially diluted to $3x10^3$, $1.5x10^3$, $3x10^2$ and $1.5x10^2$ copies. Reactions were performed using 0.2x EvaGreen intercalating dye on a real-time PCR instrument, Bio-Rad CFX96. NTC: No template control.

HelixAmp™ Lyophilized LAMP Premix (V3)

- ✓ Suppress non-specific amplification
- ✓ Ready-to-use formulation
- ✓ Streamlined setup and workflow
- ✓ Long-term stability and storage
- ✓ Simplified logistics and reduced cost
- ✓ Minimized sample contamination
- ✓ 8-strip tube type

Description

HelixAmp™ Lyophilized LAMP Premix (V3), a lyophilized LAMP reagent, provides a one-step solution for loop-mediated isothermal amplification(LAMP) of DNA targets. Especially this kit suppress non-specific product formation in isothermal amplification. Through the lyophilization method, moisture is removed from the product to facilitate the storing or transporting products at room temperature. The lyophilized LAMP premix can be rehydrated simply by adding the Rehydration Buffer along with primers and templates.

HelixAmp™ Lyophilized LAMP Premix (V3) contains engineered *Bst* DNA polymerase, dNTPs, Mg^{2+}, salts, and stabilizing agents. This kit allows the fast amplification of the target within 30 minutes with an appropriate LAMP primer set.

Application

- Loop-mediated isothermal amplification(LAMP) of DNA

Products

Feature	Cat.No.	Product	Size
Lyo-Cake	LFLP3-C96	HelixAmp™ FastLAMP Lyo-Cake (V3)	96 rxns
	LFLP3-C480	HelixAmp™ FastLAMP Lyo-Cake (V3)	480 rxns
Lyo-Dot	LFLP3-B96	HelixAmp™ FastLAMP Lyo-Dot (V3)	96 rxns

HelixAmp™ Lyophilized RT-LAMP Premix (V3)

- ✓ Suppress non-specific amplification
- ✓ Ready-to-use formulation
- ✓ Streamlined setup and workflow
- ✓ Long-term stability and storage
- ✓ Simplified logistics and reduced cost
- ✓ Minimized sample contamination
- ✓ 8-strip tube type

Description

HelixAmp™ Lyophilized RT-LAMP Premix (V3), a lyophilized RT-LAMP reagent, provides a one-step solution for loop-mediated isothermal amplification(LAMP) of RNA targets. Especially this kit suppress non-specific product formation in isothermal amplification. Through the lyophilization method, moisture is removed from the product to facilitate storing or transporting products at room temperature. The lyophilized RT-LAMP premix can be rehydrated simply by adding the Rehydration Buffer along with primers and templates.

HelixAmp™ Lyophilized RT-LAMP Premix (V3) contains engineered *Bst* DNA polymerase, thermo-stable reverse transcriptase(RTase), RNase inhibitor, dNTPs, Mg^{2+}, salts, and stabilizing agents. This kit allows the fast amplification of the target within 30 minutes with an appropriate LAMP primer set. The thermo-stable RTase is fully active at a relatively high temperature(60°C), making the one step RT-LAMP possible at a constant reaction temperature.

Application

- Loop-mediated isothermal amplification(LAMP) of RNA

Products

Feature	Cat.No.	Product	Size
Lyo-Cake	LFRLP3-C96	HelixAmp™ Fast RT-LAMP Lyo-Cake (V3)	96 rxns
	LFRLP3-C480	HelixAmp™ Fast RT-LAMP Lyo-Cake (V3)	480 rxns
Lyo-Dot	LFRLP3-B96	HelixAmp™ Fast RT-LAMP Lyo-Dot (V3)	96 rxns

08

LyoReady Premixes

2.5x qPCR LyoReady Premix

2.5x qRT-PCR LyoReady Premix

2.5x FastLAMP LyoReady Premix

2.5x Fast RT-LAMP LyoReady Premix

2.5x FastLAMP LyoReady Premix (V3)

2.5x Fast RT-LAMP LyoReady Premix (V3)

RealHelix™ 2.5x qPCR LyoReady Premix [Probe]

- ✓ Ready for lyophilization
- ✓ Glycerol-free mix containing all essential components for qPCR
- ✓ Simply add primers/probes and lyophilize
- ✓ High performance and reproducible
- ✓ UDG system: Prevention of carryover contamination

Description

RealHelix™ 2.5x qPCR LyoReady Premix [Probe] is a glycerol-free master mix for qPCR, designed to be lyophilized directly without requiring additional excipients. Primers and probes can be incorporated into the mix before the lyophilization process. RealHelix™ 2.5x qPCR LyoReady Premix [Probe] contains antibody-inhibited hot-start *Taq* DNA polymerase, dNTPs, Mg^{2+}, salts, and a set of excipients. Carryover contaminated PCR products can be removed by applying the UDG system.

Products

Cat.No.	Product	Size
SDFQP-1ML	RealHelix™ 2.5x qPCR LyoReady Premix [Probe]	1 ml
SDFQP-10ML		10 ml
SDFQP-100ML		100 ml
SDFQPU-1ML	RealHelix™ 2.5x qPCR LyoReady Premix [Probe] [UDG System]	1 ml
SDFQPU-10ML		10 ml
SDFQPU-100ML		100 ml

RealHelix™ 2.5x qRT-PCR LyoReady Premix [Probe]

- ✓ Ready for lyophilization
- ✓ Glycerol-free mix containing all essential components for qRT-PCR
- ✓ Simply add primers/probes and lyophilize
- ✓ High performance and reproducible
- ✓ UDG system: Prevention of carryover contamination

Description

RealHelix™ 2.5x qRT-PCR LyoReady Premix [Probe] is a glycerol-free master mix for qRT-PCR, designed to be lyophilized directly without requiring additional excipients. Primers and probes can be incorporated into the mix before the lyophilization process. RealHelix™ 2.5x qRT-PCR LyoReady Premix [Probe] contains antibody-inhibited hot-start *Taq* DNA polymerase, reverse transcriptase, RNase inhibitor, dNTPs, Mg^{2+}, salts, and a set of excipients. Carryover contaminated PCR products can be removed by applying the UDG system.

Products

Cat.No.	Product	Size
SDFQR-1ML	RealHelix™ 2.5x qRT-PCR LyoReady Premix [Probe]	1 ml
SDFQR-10ML		10 ml
SDFQR-100ML		100 ml
SDFQRU-1ML	RealHelix™ 2.5x qRT-PCR LyoReady Premix [Probe] [UDG System]	1 ml
SDFQRU-10ML		10 ml
SDFQRU-100ML		100 ml

HelixAmp™ 2.5x FastLAMP LyoReady Premix

- ✓ Ready for lyophilization
- ✓ Glycerol-free mix containing all essential components for LAMP
- ✓ Simply add primers/probes and lyophilize
- ✓ High performance and reproducible

Description

HelixAmp™ 2.5x FastLAMP LyoReady Premix is a glycerol-free master mix for LAMP, designed to be lyophilized directly without requiring additional excipients. Primers and probes can be incorporated into the mix before the lyophilization process. HelixAmp™ 2.5x FastLAMP LyoReady Premix contains *Bst* DNA polymerase, dNTPs, Mg^{2+}, salts, and excipients.

Products

Cat.No.	Product	Size
SFLP-1ML	HelixAmp™ 2.5x FastLAMP LyoReady Premix	1 ml
SFLP-10ML		10 ml
SFLP-100ML		100 ml

HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix

- ✓ Ready for lyophilization
- ✓ Glycerol-free mix containing all essential components for RT-LAMP
- ✓ Simply add primers/probes and lyophilize
- ✓ High performance and reproducible

Description

HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix is a glycerol-free master mix for RT-LAMP, designed to be lyophilized directly without requiring additional excipients. Primers and probes can be incorporated into the mix before the lyophilization process. HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix contains *Bst* DNA polymerase, thermo-stable reverse transcriptase(RTase), RNase inhibitor, dNTPs, Mg^{2+}, salts, and a set of excipients.

Products

Cat.No.	Product	Size
SFRLP-1ML	HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix	1 ml
SFRLP-10ML		10 ml
SFRLP-100ML		100 ml

HelixAmp™ 2.5x FastLAMP LyoReady Premix (V3)

- ✓ Ready for lyophilization
- ✓ Glycerol-free mix containing all essential components for LAMP
- ✓ Simply add primers and lyophilize
- ✓ High performance and reproducible

Description

HelixAmp™ 2.5x FastLAMP LyoReady Premix (V3) is a glycerol free master mix for LAMP, designed to be lyophilized directly without requiring additional excipients. Especially this premix suppress non-specific product formation in isothermal amplification. Primers and intercalating dye can be incorporated into the mix before the lyophilization process. HelixAmp ™ 2.5x FastLAMP LyoReady Premix (V3) contains *Bst* DNA polymerase, dNTPs, Mg^{2+}, salts, and excipients.

Products

Cat.No.	Product	Size
SFLP3-1ML	HelixAmp™ 2.5x FastLAMP LyoReady Premix (V3)	1 ml
SFLP3-10ML		10 ml
SFLP3-100ML		100 ml

HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix (V3)

- ✓ Ready for lyophilization
- ✓ Glycerol-free mix containing all essential components for RT-LAMP
- ✓ Simply add primers and lyophilize
- ✓ High performance and reproducible

Description

HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix (V3) is a glycerol-free master mix for RT-LAMP, designed to be lyophilized directly without requiring additional excipients. Especially this premix suppress non-specific product formation in isothermal amplification. Primers and intercalating dye can be incorporated into the mix before the lyophilization process. HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix (V3) contains *Bst* DNA polymerase, thermo-stable reverse transcriptase(RTase), RNase inhibitor, dNTPs, Mg^{2+}, salts, and a set of excipients.

Products

Cat.No.	Product	Size
SFRLP3-1ML	HelixAmp™ 2.5x Fast RT-LAMP LyoReady Premix (V3)	1 ml
SFRLP3-10ML		10 ml
SFRLP3-100ML		100 ml

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