PCR Enzymes and Kits

Enzymes, optimized PCR mixes and other reagents for human, animal, plant and environmental applications

meridian BIOSCIENCE®
LIFE DISCOVERED. LIFE DIAGNOSED.

Choosing the Right DNA Polymerase

Four basic properties of DNA Polymerases define the best enzyme for your particular research needs: thermal stability, extension rate, fidelity and processivity. Different configurations of these properties have produced different classes of DNA polymerases, namely...

Standard DNA polymerases

Suitable for routine PCR, such as detection of amplified product and estimation of product size, producing a single-based 'A' overhang, enabling direct insertion into T/A cloning vectors.

Hot-Start (HS) polymerases

Used to suppress non-specific product amplification during setup and to increase yield of the desired product. Hot-Start is useful when DNA template amounts are low, DNA templates are highly complex, or several pairs of primers are used, as in multiplex PCR.

High-fidelity polymerases

These remove erroneous bases incorporated in the growing DNA strand, increasing the accuracy of DNA synthesis from template DNA. For cloning and expression of amplified product, mutagenesis studies and related applications, proofreading enzymes should be used.

Polymerases for amplification of long amplicons

Amplification of long amplicons combines the processivity of standard DNA polymerases with the accuracy of a proofreading polymerase. This is achieved by blending two polymerases with an optimized buffer, to give amplicons as long as 25 kb from genomic DNA.

	MyTaq	MyTaq HS	MyFi	IMMOLASE	VELOCITY	ACCUZYME	SimpliFi	RANGER
Properties								
Template Length	≤ 5 kb	≤ 5 kb	≤ 10 kb	≤ 5 kb	≤ 10 kb	≤ 5 kb	≤ 5 kb	≤ 25 kb
Hot-Start		✔	✔	✔			✔	✔
High Fidelity / Fidelity Rate (xTaq)			✔ 3.5x		✔ 40x	✔ 30x	✔ 130x	
High Processivity			✔		✔			✔
Format								
Pre Mix available	✔	✔	✔	✔		✔	✔	✔
Direct Gel Loading	✔	✔						
Applications								
Routine PCR	○	✔						
Fast PCR	○	✔	✔		○			
Long Range PCR (over 5 kb)			○					✔
High Specificity PCR		✔	○	✔			✔	○
Blunt End Cloning					✔	✔	✔	
Multiplex PCR		✔	○				✔	
TA Cloning	✔	✔	✔	✔				✔
GC-Rich PCR		○	✔				✔	
Low-Copy PCR		✔	○	✔	○			
Colony PCR		✔						
Crude Sample PCR			✔		✔		✔	
Genotyping	○	✔	○					
Bisulfite Modified PCR		✔						
High-Fidelity PCR					✔	✔	✔	
High-Yield PCR	○	✔						
NGS Library Amplification					○	○	✔	

✔ Recommended choice for application

○ Suitable

MyTaq™ DNA Polymerase and Mixes

A new generation polymerase that delivers improved yield, sensitivity, speed and robustness when amplifying targets from any template.

- Sensitive -

Exhibits increased affinity for DNA. Thereby improving amplification of even limiting amounts of template

- Efficient -

Novel buffer system maximizes efficiency of PCR amplification, delivering improved yield of any PCR product

- Robust -

Reliable amplification in the presence of inhibitors and with even the most challenging DNA targets

- Flexible -

Ideal for amplifying any target up to 5 kb, including DNA extracted from human, animal and plant samples

- Fast -

Developed to give sensitive, reproducible and robust amplification of a broad range of targets under fast thermal cycling conditions

- Convenient -

Includes all of the components necessary for high performance PCR amplification

MyTaq is recommended for all standard PCR applications. MyTaq DNA Polymerase and MyTaq Reaction Buffer are a unique combination of next-generation polymerase and novel buffer system that deliver very high yield PCR amplification over a wide range of templates. MyTaq has increased affinity for DNA, enabling reliable amplification from very low amounts of template.

MyTaq DNA Polymerase is a high-performance enzyme giving robust amplification, making it the perfect choice for complex templates (Fig. 1). The combination of MyTaq and optimized buffer system allow for faster PCR reactions compared with other polymerases, therefore reducing overall run time from approximately 1 hour to under 30 minutes. This is achieved without compromising specificity or yield (Fig. 2), reducing the reaction time allows for increased throughput and faster time to results.

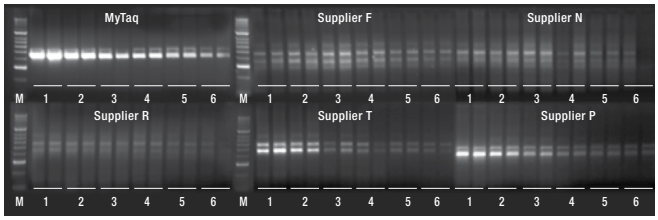


Fig. 1 Robust amplification of GC-rich human genomic DNA (61% GC content)
MyTaq was compared with DNA polymerases from other suppliers for the amplification of a 450 bp fragment of the human myc gene, using a serial dilution of genomic DNA (1 µg to 12.5 ng, lanes 1-6 respectively, HyperLadder 1 kb (M)). The results illustrate that MyTaq delivers higher yield and sensitivity as compared with all five competing products.

APPLICATIONS

STANDARD PCR · HIGH-YIELD PCR · FAST PCR · COLONY PCR · TA CLONING

"We use MyTaq DNA Polymerase for our mouse colony PCR screening. My established PCR protocols almost always work, and the run is shorter. Even new PCR protocols are much easier to establish since this polymerase is more robust than many others. We found that in several instances, if nothing works... this polymerase does." *Monica Kiela, University of Arizona, Tuscon, US*

MyTaq Mix contains all the reagents required for easy-PCR set-up, MyTaq Mix is conveniently supplied in one tube, reducing the number of pipetting steps required, facilitating greater efficiency, reproducibility and ease for automation.

MyTaq is also supplied as MyTaq Red DNA Polymerase and MyTaq Red Mix, which includes a 5x MyTaq Red Reaction Buffer that increases the visual contrast between the reagent and the reaction vessel for improved convenience and pipetting accuracy. The red dye also enables samples to be loaded directly on to a gel after the PCR without the need to add loading buffer.

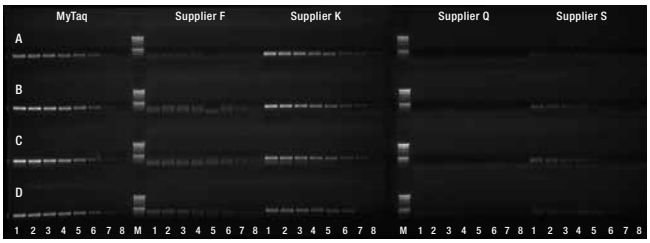


Fig. 2 Fast amplification of human genomic DNA (performed in 27.5 minutes) Comparative amplification of a 450 bp fragment of the human myc gene (61% GC) was used to examine MyTaq with another polymerase. The PCR was performed using a serial dilution of genomic DNA (200 ng to 30 pg, lanes 1-8 respectively. HyperLadder 1 kb (M)) and under fast cycling conditions. In contrast to other polymerases, MyTaq readily copes with the faster reaction times, resulting in higher yield without the need for optimization.

Product	Size	Cat No.
MyTaq DNA Polymerase	500 Units	BIO-21105
	2500 Units	BIO-21106
	5000 Units	BIO-21107
MyTaq Red DNA Polymerase	500 Units	BIO-21108
	2500 Units	BIO-21109
	5000 Units	BIO-21110
MyTaq Mix, 2x	200 Reactions	BIO-25041
	1000 Reactions	BIO-25042
MyTaq Red Mix, 2x	200 Reactions	BIO-25043
	1000 Reactions	BIO-25044

MyTaq™ HS Polymerase and Mixes

A new generation of hot-start polymerase that delivers improved specificity, yield, speed and robustness when amplifying targets from any DNA template.

- Sensitive -

Exhibits increased affinity for DNA. Thereby improving amplification of even limiting amounts of template

- Efficient -

Novel buffer system maximizes efficiency of PCR amplification, delivering improved yield of any PCR product

- Specific -

An antibody-mediated hot-start enzyme that remains completely inactive during PCR set-up to prevent non-specific amplification

- Flexible -

Ideal for amplifying any target up to 5 kb, including DNA extracted from human, animal and plant samples

- Fast -

Developed to give sensitive, reproducible and robust amplification of a broad range of targets under fast conditions

- Convenient -

MyTaq HS Mix and MyTaq HS Red Mix are all-in-one-tube master mixes that improve the speed, convenience and accuracy of PCR set-up

MyTaq HS is a new generation of antibody-mediated hot-start enzyme, engineered for highly specific and efficient amplification from even the most challenging templates. MyTaq HS remains inactive at room temperature allowing for convenient reaction set-up, thereby reducing non-specific amplification that can hinder PCR assays from the start.

MyTaq HS only requires one-minute activation and allows fast cycling conditions to be used, reducing the reaction time to under 30 minutes, without compromising PCR specificity or yield (Fig. 1). This makes MyTaq HS suitable for both routine and high-throughput PCR.

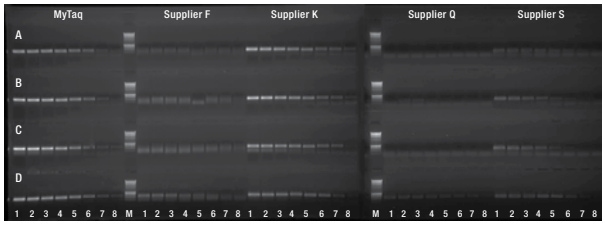


Fig. 1 Fast amplification was carried out on a range of human genomic targets
Using a 3-fold serial dilution of human genomic DNA (100 ng - 3 pg, lanes 1-8 respectively, HyperLadder 1 kb (M)), a 340 bp (A) and 450 bp (B) fragment of the myc gene, a 525 bp (C) fragment of the EGFR gene and a 530 bp (D) fragment of the AGTR1 gene, was amplified using MyTaq HS DNA Polymerase and polymerases from other suppliers according to the manufacturers' protocols. The results illustrate the ability of MyTaq to perform well across all four human genes.

APPLICATIONS

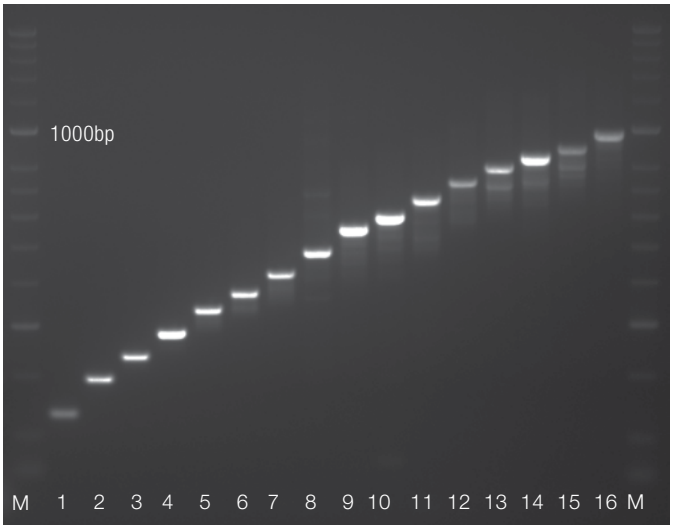
FAST PCR · MULTIPLEX PCR · GENOTYPING · COMPLEX TEMPLATES (E.G. GC-RICH) · COLONY PCR · LOW COPY NUMBER PCR ASSAYS · HIGH-THROUGHPUT ASSAYS WITH PROLONGED SET-UP

"Certain PCR can be problematic if the Taq is not top quality. We had barely any signal with other Taq. When we switched to MyTaq HS, the bands were there and clean! Nice product!" *University of California, San Francisco (UCSF), US*

MyTaq HS Mix is based on the latest technology in PCR enzyme preparation, the pre-configured reaction mix contains a unique combination of salts and additives to ensure comparable efficiencies for annealing and extension of all primers in the reaction. This makes MyTaq HS Mix ideal for multiplex PCR (Fig. 2).

MyTaq HS is also supplied as MyTaq HS Red DNA Polymerase and MyTaq HS Red Mix, which includes a 5x MyTaq Red Reaction Buffer that increases the visual contrast between the reagent and the reaction vessel for improved convenience and pipetting accuracy. The red dye also enables samples to be loaded directly on to a gel after the PCR without the need to add loading buffer.

A



B

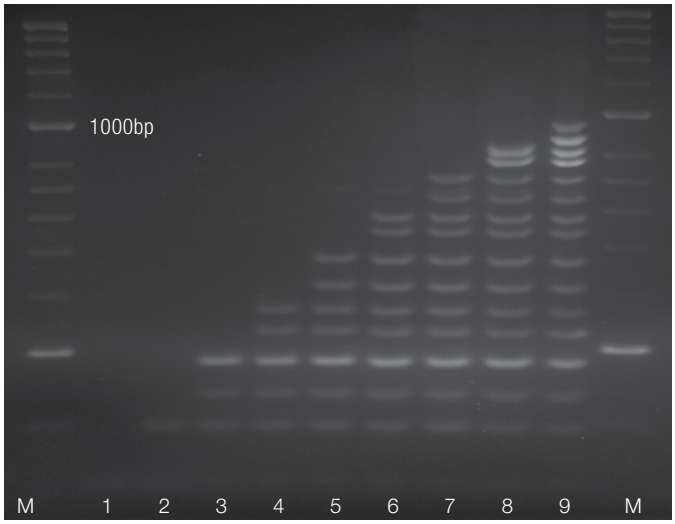


Fig. 2 Successful 16-plexing using MyTaq HS Mix
50 ng of human genomic DNA was used as a template in 25 µL PCR reactions, with primers to amplify A) individual amplicons of 135 bp up to 961 bp (lanes 1-16 respectively) and B) 1-16 plex reaction (lanes 1-9 respectively). The cycling was performed under the recommended multiplex conditions: 95 °C for 2 min, followed by 25 cycles of 95 °C for 30 s, 65 °C for 4 min. These results illustrate that MyTaq HS Mix can be used successfully for multiplex PCR without the need for extensive optimization.

Product	Size	Cat No.
MyTaq HS DNA Polymerase	250 Units	BIO-21111
	1000 Units	BIO-21112
	2500 Units	BIO-21113
MyTaq HS Red DNA Polymerase	1000 Units	BIO-21115
	2500 Units	BIO-21116
MyTaq HS Mix, 2x	200 Reactions	BIO-25045
	1000 Reactions	BIO-25046
MyTaq HS Red Mix, 2x	200 Reactions	BIO-25047
	1000 Reactions	BIO-25048

MyFi™ DNA Polymerase and Mix

A unique blend of highly-efficient MyTaq HS DNA Polymerase and a proprietary proofreading enzyme, that combine to give increased target affinity, for use with challenging templates and inhibitor-rich samples.

- Robust -

Enzyme blend and buffer system promotes reliable amplification of the most challenging and complex targets, even in the presence of inhibitors

- Sensitive -

Improved target affinity and high processivity ensure successful amplification in low-copy number assays

- Efficient -

High-yield amplification of a broad range of targets up to 10 kb including complex DNA extracted from human, animal and plant samples

- Specific -

An antibody-mediated hot-start blend that remains completely inactive during PCR et-up to prevent non-specific amplification

- Convenient -

Advanced buffer system minimizes the requirements for PCR optimization thereby reducing time to results and eliminating the cost of unnecessary repeats

- Accurate-

Proofreading component delivers 3.5x higher fidelity than Taq DNA Polymerase, enabling cloning of PCR products

MyFi has been developed to give reliable amplification of targets up to 10 kb from challenging and complex samples. MyFi shows improved tolerance to PCR inhibitors, thereby enabling reliable detection from samples from which DNA is difficult to purify. Furthermore, a unique buffer system and enzyme blend promote highly sensitive amplification, ideal for low-copy number targets.

The inclusion of MyTaq HS means MyFi generates PCR products with 3' -A overhangs making it suitable for TA cloning. MyFi has the added convenience of room temperature reaction assembly to avoid non-specific amplification and primer-dimer formation.

An advanced buffer system and enzyme blend to give increased target affinity, ideal for amplification of cDNA libraries, complex genomic fragments (Fig. 1) and GC-rich targets.

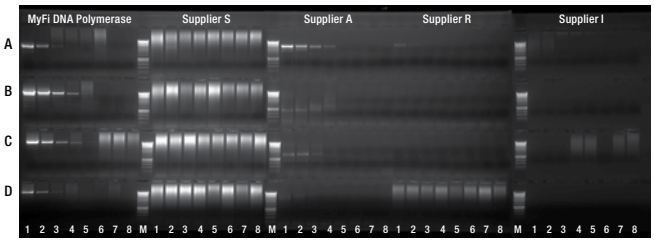


Fig. 1 Amplification of complex DNA up to 10 kb
A 3.9 kb (A) fragment of α-1-antitrypsin (AT-R3) gene, a 7 kb (B), a 9 kb (C) and a 10 kb (D) fragment (respectively) of human (ß-globin) HbG gene, were amplified using MyFi DNA Polymerase and the results were compared with amplifications using other high-fidelity hot-start DNA polymerases. A 5-fold serial dilution of human genomic DNA (5 ng - 0.32 pg, lanes 1-8 respectively, HyperLadder 1 kb (M)), was amplified according to the manufacturers' protocol. The results illustrate that MyFi can be used to amplify products up to 10 kb, in contrast to competing high-fidelity hot-start DNA polymerases.

APPLICATIONS

AMPLIFICATION OF CHALLENGING AND COMPLEX TEMPLATES
LONGER PCR (UP TO 10 KB) · ROBUST PCR · LOW-COPY PCR · TA CLONING

"We commonly use the Meridian MyFi polymerase and it works better than any other polymerase. MyFi polymerase could amplify complicated short tandem repeat sequences (STR or SSR/microsatellite) better than any other kit."

Hiroshi Shinozuka, AgriBio, Bandoora Australia

MyFi Mix is supplied as a master mix that requires the addition of only template and primers, thereby reducing the number of pipetting steps during PCR set-up, for improved speed, throughput and assay reproducibility (Fig. 2). The inclusion of dNTPs, MgC_{l2} and enhancers at optimal concentrations, helps eliminate the need for optimization, thereby saving on time, cost and making MyFi Mix well suited to automation.

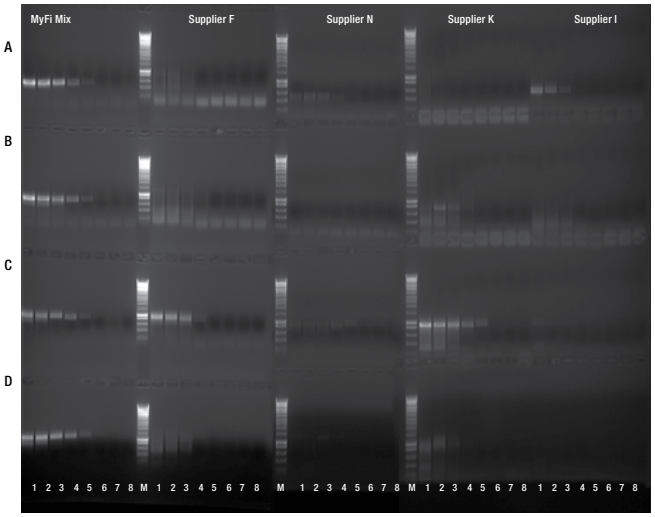


Fig. 2 Efficiency and sensitivity of high-fidelity polymerase mixes
A 525 bp (A) fragment of human epidermal growth factor receptor (EGFR) gene, a 750 bp (B) fragment of translation factor p64 (myc) gene, a 900 bp (C) fragment of angiotensin II receptor type I (AGTR1) gene, a 1.2 kb (D) fragment of EGFR gene, were amplified using MyFi Mix and the results were compared with amplifications using high-fidelity hot-start mixes from other suppliers. A serial dilution of human genomic DNA (5 ng - 0.32 pg, lanes 1-8 respectively, HyperLadder 1 kb (M)), was amplified according to the manufacturers' protocol. The results illustrate that MyFi Mix out-performed alternative high-fidelity mixes giving higher efficiency and sensitivity over a wide range of sizes.

Product	Size	Cat No.
MyFi DNA Polymerase	250 Units	BIO-21117
	500 Units	BIO-21118
	2500 Units	BIO-21119
MyFi Mix	100 Reactions	BIO-25049
	500 Reactions	BIO-25050

RANGER DNA Polymerase and Mix

A unique blend of high-performance hot-start MyTaq HS DNA Polymerase and a proprietary proofreading enzyme, specifically developed for long PCR applications.

- Efficient -

Specifically developed to give reliable amplification of fragments between 10 kb and 25 kb in length

- Specific -

Incorporates an antibody-mediated hot-start enzyme blend that remains completely inactive during PCR set-up to prevent non-specific amplification

- Fast -

Rapid enzyme activation and highly efficient amplification support reduced time to results

- Flexible -

Ideal for amplifying a broad range of large fragments even from complex targets, including human genomic DNA

- Accurate -

Possesses 3' - 5' proofreading exonuclease activity for increased fidelity, thereby enabling cloning of long PCR products

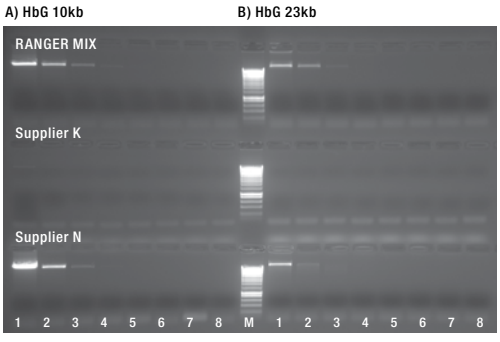


Fig. 1 Efficiency and sensitivity of RANGER Mix
Using a 5-fold serial dilution of human genomic DNA (5 ng - 6 pg, lanes 1-8 respectively, HyperLadder 1 kb (M)), a 10 kb fragment A) and a 23 kb fragment B) of human ß-globin (HbG) gene, was amplified using RANGER Mix and high-fidelity hot-start DNA mixes from supplier K and supplier N, according to the manufacturers' protocols. The results illustrate that RANGER Mix is more sensitive than mixes from other suppliers, particularly with larger fragments.

APPLICATIONS

LONG PCR · TA CLONING

RANGER is an easy-to-use, high-performance enzyme blend, specifically developed to amplify fragments up to 25 kb in length. RANGER contains a unique combination of highly-efficient DNA polymerase and novel buffer system that deliver the improved efficiency necessary for reliable amplification of longer amplicons.

RANGER is an antibody-mediated hot-start enzyme blend that eliminates non-specific amplification during reaction set-up. The inactivated enzymes do not possess polymerase activity, thereby preventing non-specific amplification, such as primer-dimer formation, that often hinder long PCR reactions from the start.

RANGER DNA Polymerase includes a novel buffer system containing dNTPs, MgC_{l2} and enhancers at optimal concentrations, which deliver increased processivity, sensitivity and specificity, thereby enabling successful amplification of long human genomic DNA fragments.

RANGER Mix is an all-in-one master mix containing dNTPs, MgC_{l2} and enhancers at optimal concentrations, minimizing the requirement for PCR optimization and driving greater sensitivity (Fig. 1). RANGER Mix also improves reproducibility and minimizes the requirement for assay repeats, by reducing the number of pipetting steps, and therefore the risk of manual error, during reaction set-up.

Product	Size	Cat No.
RANGER DNA Polymerase	250 Units	BIO-21121
	500 Units	BIO-21122
RANGER Mix	500 reactions	BIO-25052

IMMOLASE™ DNA Polymerase and Mix

IMMOLASE™ is a heat-activated thermostable DNA polymerase that eliminates all non-specific priming and the formation of primer-dimers, thereby delivering improved specificity when compared to standard polymerases.

- Specific -

Chemical hot-start eliminates non-specific amplification

- High-performance -

Robust amplification with challenging DNA targets

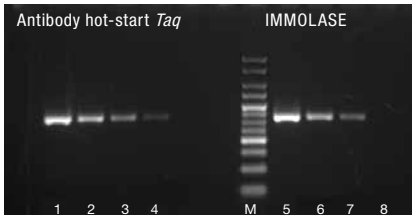
- Efficient -

Optimized buffer system maximizes efficiency of PCR amplification

- Convenient -

ImmoMix and ImmoMix Red are all-in-one master mixes that improve the speed and convenience of PCR set-up

10 Minute Heat Activation



No Heat Activation

Fig. 1 Heat-activation property of IMMOLASE
A 200 bp fragment from pGEM3zf (+) was amplified with IMMOLASE DNA Polymerase and the results were compared with PCR reactions using an antibody-mediated hot-start Taq. A 2-fold serial dilution of pGEM (1 ng – 125 pg) was amplified using the hot-start Taq (lanes 1 – 4) and IMMOLASE (lanes 5 – 8), with and without a 10-minute heat-activation step. Unlike the antibody-mediated hot-start polymerase, amplification was detected without full heat-activation of IMMOLASE. Illustrating that IMMOLASE can be kept at room temperature without exhibiting polymerase activity resulting in non-specific PCR products.

APPLICATIONS

MULTIPLEX PCR · TA CLONING · LOW-COPY NUMBER PCR

Assembling PCR reaction mixtures at room temperature can result in increased formation of non-specific product ultimately resulting in decreased yield in the desired amplicon and impaired gel analysis. IMMOLASE is inactive at room temperature allowing for convenient reaction set-up and requires heat treatment for 10 minutes at 95 °C prior to PCR cycling to be activated (Fig. 1). Subsequently the reaction can be handled according to preferred protocols for thermostable DNA polymerases.

IMMOLASE leaves an A' overhang making it suitable for TA cloning and has been optimized for a wide variety of templates. Additional $MgCl_2$ solution is included should any fine adjustments be required.

ImmoMix™ is a complete, ready-to-use, heat-activated 2x reaction mix, which simply requires the user to add template and primers. ImmoMix decreases the number of pipetting steps required for reaction set-up, reducing the risk of contamination, delivering high-yield PCR amplification (Fig. 2) and increased reproducibility.

ImmoMix Red combines all the advantages of ImmoMix with the inclusion of a red dye. The red dye increases the visual contrast between the reagent and the reaction vessel for improved convenience and to improve pipetting accuracy. The red dye also enables completed PCR reactions to be loaded directly on to a gel without the need for an additional loading buffer.

Product	Size	Cat No.
IMMOLASE DNA Polymerase	250 Units	BIO-21046
	500 Units	BIO-21047
ImmoMix	500 Reactions	BIO-25020
ImmoMix Red	500 Reactions	BIO-25022

ACCUZYME™ DNA Polymerase and Mix

ACCUZYME is a robust, efficient, proofreading enzyme that gives increased fidelity in high-yield PCR, for use in all routine cloning applications.

- Efficient -
Highly-productive target amplification and removal of 3' A overhangs

- Accurate -
Possesses 3' to 5' proofreading exonuclease activity that delivers an error rate of 3.0 x 10^6 for increased PCR fidelity versus Taq DNA polymerase

- Sensitive -
High-yield amplification from limiting amounts of human, animal and plant template DNA

- Robust -
Developed for reliable amplification of even the most challenging targets, including genomic DNA and GC-rich targets

- Flexible -
Ideal for amplifying any target up to 5 kb with DNA extracted from mammalian tissue samples

- Convenient -
Advanced buffering system minimizes the requirements for PCR optimization, thereby reducing time-to-results and eliminating the cost of unnecessary repeats

ACCUZYME is a proprietary proofreading enzyme that offers increased fidelity and higher PCR yield, even in demanding applications. ACCUZYME has an error-rate of 3.0 x 106 and results in blunt ended amplicons up to 5 kb in length, making it ideal for use in cloning and site-directed mutagenesis.

ACCUZYME is supplied with a buffering system that provides ideal conditions for most PCR assays. Consequently, the cost and effort typically associated with optimizing assay performance is often eliminated. In circumstances where further optimization is required to improve PCR speciality and/or yield, ACCUZYME includes an additional vial of $MgCl_2$.

ACCUZYME Mix dramatically reduces the time needed to set up reactions, thereby minimizing the risk of contamination. Greater efficiency and reproducibility (Fig. 1) are achieved by reducing the number of pipetting steps that often leads to variation in reaction set-up.

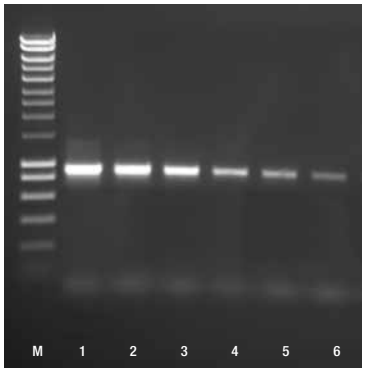


Fig. 1 Robust amplification with low template concentrations
Using a 10-fold serial dilution of human genomic DNA (500 ng - 5 pg, lanes 1-6 respectively, HyperLadder 1 kb (M)) an 800 bp fragment of the human angiotensin receptor II gene was amplified using ACCUZYME Mix, containing 2.5 mM $MgCl_2$. The results illustrate the high sensitivity of ACCUZYME Mix with low concentrations of input DNA.

Product	Size	Cat No.
ACCUZYME DNA Polymerase	500 Units	BIO-21052
ACCUZYME Mix	500 Reactions	BIO-25028

APPLICATIONS

HIGH-FIDELITY PCR · BLUNT-END CLONING · SITE-DIRECTED MUTAGENESIS

SimpliFi HS Mix

SimpliFi HS Mix is a high-fidelity polymerase mix using aptamer-based hot-start technology, highly suited to amplification of DNA from crude samples, for fast, inexpensive target enrichment, NGS library amplification and cloning applications.

- Robust -

Optimized enzyme/buffer mix promotes reliable amplification of a broad range of targets, including complex DNA extracted from human, animal and plant samples

- Specific -

The aptamer-based hot-start remains completely inactive during PCR set-up and after amplification, to prevent non-specific products

- Optimized -

High yields with minimal optimization, regardless of a template's GC content, reducing time to results and eliminating the cost of unnecessary repeats

- Enhanced accuracy -

Higher than 130x Taq fidelity, reducing errors for next generation sequencing (NGS) library amplification

SimpliFi HS Mix is a combination of the latest advances in buffer chemistry and PCR enhancers and stabilizers, together with an aptamer-mediated hot-start polymerase, dNTPs and $MgCl_2$. It has been designed for highly reproducible, accurate assay results in the presence of inhibitors. The advanced buffer chemistry and enhancers has been developed for fast PCR and is designed for superior sensitivity and specificity, making SimpliFi HS Mix perfect for NGS library amplification

Fidelity vs Taq Polymerase

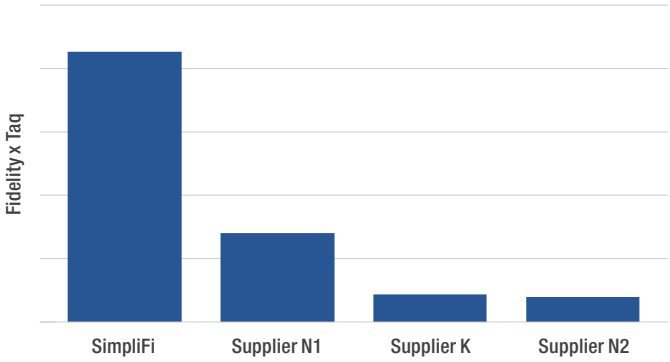


Fig.1 Fidelity comparison across commercially available high-fidelity polymerases. Purified plasmid DNA was extended using SimpliFi, the complementary strands were synthesized using a standard high-fidelity polymerase, in both cases using primers containing a partial Illumina adapter, a random product barcode and a condition barcode. Primers complementary to the partial Illumina adapter are used to PCR amplify the complementary strands, forming the sequencing library. After next-generation sequencing, reads are grouped according to condition barcode and product barcode. Sequences are aligned to the correct sequence and errors are called. Errors are only kept if they are present in all copies, otherwise they are discarded as sequencing error. Exactly the same method was used to determine the error rate for supplier N1, Supplier K and Supplier N2 and the fidelity values were normalized to Taq polymerase fidelity.

Product	Size	Cat No.
SimpliFi HS Mix (2x)	100 Reactions	BIO-25060
SimpliFi HS Mix (2x)	500 Reactions	BIO-25061

APPLICATIONS

GENE EXPRESSION · VIRAL AND BACTERIAL DETECTION · ROBUST PCR · HIGH-SPECIFICITY PCR · HIGH-FIDELITY PCR · GC/AT-RICH PCR

VELOCITY DNA Polymerase

VELOCITY DNA Polymerase is an ultra-fast thermostable enzyme possessing 3' - 5' exonuclease activity that delivers exceptional fidelity and outstanding PCR yield even under fast PCR conditions.

- Accurate -

Possesses 3' - 5' proofreading exonuclease activity that delivers an error rate of 4.4 x 10^7 for excellent PCR fidelity

- Efficient -

Highly processive enzyme and advanced buffering system for increased PCR yield from even the most challenging templates

- Fast -

Extension rate of 15 s/ kb for ≤ 5 kb amplicons giving increased yield under fast thermal cycling conditions

- Robust -

Highly processive nature of the enzyme confers an increased tolerance to impurities and ability to amplify complex templates

- Flexible -

Ideal for high-fidelity amplification of targets up to 10 kb from human, animal and plant DNA

VELOCITY DNA Polymerase is recommended for high-fidelity PCR amplification. The enzyme possesses 3' – 5' proofreading exonuclease activity that provides an exceptional error rate of 4.4 x 10^7 (or 40 x greater fidelity than standard Taq), for highly accurate amplification from a very broad range of human, animal and plant targets. Furthermore, VELOCITY is a highly processive enzyme with extension rates as fast as 15 s/kb, thereby enabling a reduction in PCR turnaround times.

VELOCITY delivers exceptional fidelity with outstanding PCR yield even from low template concentrations. The increased processivity of VELOCITY, results in shorter extension times for fast PCR, increased product yield and the ability to amplify longer fragments. VELOCITY also offers robust and reliable product yields, even in assays where PCR conditions are challenging, including the presence of impurities (Fig. 1) or GC-rich targets.

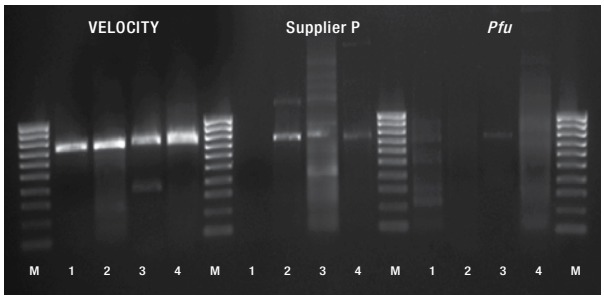


Fig. 1 Amplification of GC-rich fragments from human genomic DNA
Amplification of a 728 bp, fragment (76.9 % GC), a 724 bp fragment gene (68 % GC), a 723 bp fragment (66.9% GC) and 788 bp fragment (70.9 % GC) (Lanes 1-4 respectively (HyperLadder 100 bp (M)), was used to compare VELOCITY, a polymerase from another supplier (P) and wild-type Pfu. The results illustrate that VELOCITY is reliable even with GC-rich templates, giving the highest product yield.

Product	Size	Cat No.
VELOCITY DNA Polymerase	250 Units	BIO-21098
	500 Units	BIO-21099

APPLICATIONS

HIGH-FIDELITY PCR · SITE DIRECTED MUTAGENESIS · LONG PCR · BLUNT-END CLONING

FAST PCR · HIGH-YIELD PCR · AMPLIFICATION OF CHALLENGING TEMPLATES

Reverse Transcription PCR

MyTaq One-Step RT-PCR Kit has been formulated for highly reproducible first-strand cDNA synthesis and subsequent PCR in a single tube.

- Sensitive -

Incorporates a blend of high-affinity RT and novel MyTaq HS DNA Polymerase, enabling amplification of low-copy number targets from ≥ 3 pg total RNA

- Efficient -

Novel one-step buffer system maximizes the efficiency of both the reverse transcription and PCR steps, delivering improved yield of any target

- Robust -

RT tolerates the higher reaction temperatures required to overcome secondary structure, giving reliable detection of even challenging and GC-rich targets

- Specific -

MyTaq HS DNA Polymerase is an antibody-mediated hot-start enzyme that remains completely inactive during PCR set-up to prevent non-specific amplification

- Flexible -

Utilizes gene-specific primers for full length reverse transcription and subsequent PCR amplification of any RNA target

- Convenient -

An all-in-one-tube master mix that improves the speed, convenience and accuracy of RT-PCR

MyTaq One-Step RT-PCR Kit has been formulated for highly reproducible first-strand cDNA synthesis and subsequent PCR in a single tube. A combination of the latest advances in buffer chemistry together with a proprietary reverse transcriptase and MyTaq HS DNA Polymerase ensure ultra-sensitive (Fig. 1) and highly-specific amplification of a broad range of RNA targets.

MyTaq One-Step Kit consists of a proprietary reverse transcriptase, 2x MyTaq HS Mix and the potent RNase inhibitor, RiboSafe, that are blended to create a simple to use all-in-one mix. The kit is ideal for determining the presence or absence of RNA templates and quantifying expression through qualitative or semi-quantitative analysis of RNA transcription levels. The one-step format is also perfect for the synthesis of double-stranded cDNA products for subsequent gene expression analysis.

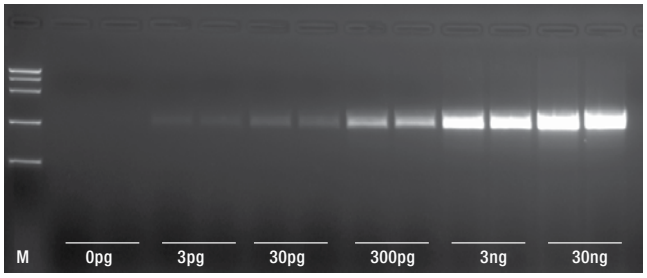


Fig.1 High-sensitivity
A 10-fold serial dilution of mouse total RNA in duplicate (30 ng - 3 pg respectively including HyperLadder 50 bp (M)) was reverse transcribed at 45 °C for 40 min, followed by 95 °C for 5 min. The cDNA was amplified using RN18S-1000 primers to produce a 1 kb fragment. The results illustrate that MyTaq One-Step RT-PCR Kit was able to amplify low-copy number samples.

Product	Size	Cat No.
MyTaq One-Step RT-PCR Kit	25 Reactions	BIO-65048
	100 Reactions	BIO-65049

APPLICATIONS

GENE-EXPRESSION ANALYSIS · TRANSCRIPTION ANALYSIS · CDNA CLONING · MULTIPLEX RT-PCR

Direct PCR Kits

MyTaq™ Direct PCR kits offer outstanding convenience for DNA amplification, by allowing PCR directly from unpurified samples. Smaller amounts of sample can be used in the PCR reaction without the need for purification steps, that can be expensive, laborious and time consuming or involve the use of hazardous chemicals.

"I've tested a number of products and by far the best one was MyTaq Blood-PCR Kit. The major advantage is that it works on blood samples and crude lysates. This product will also amplify larger amplicons than other products tested, even in a multiplex scenario. Other key advantages include the hot-start and its ability to withstand 30 freeze-thaw cycles"

Markus Zeller AutoGenomics, California, US

"When we compared the performance of our routine supplier's RTase against Meridian's MyTaq One-Step RT-PCR, the other supplier's RTase gave two false negatives in five different grapevine samples tested for Grapevine rupestris stem-pitting-associated Foveavirus. We were convinced to immediately switch"

University of Adelaide, Australia

Sensitive

Incorporates MyTaq HS DNA Polymerase that exhibits increased affinity for DNA, thereby improving yield of even the most challenging targets

Fast

Short protocol times

Simple

Few protocol steps greatly reduce the risk of sample loss and contamination and minimizes manual effort

Robust

Novel buffer systems allow amplification of targets from mammalian tissue, blood and plant samples

MyTaq™ Extract-PCR Kit

MyTaq Extract-PCR Kit provides quick and easy extraction and amplification of DNA from a variety of tissue types. This kit maximizes sensitivity while simultaneously minimizing contamination risks, to deliver greater experiment success rates.

- Fast -

Single-tube protocol that eliminates wash steps, giving high-yield, PCR-ready DNA in just 15 minutes

- Simple -

Few protocol steps greatly reduce the risk of sample loss and contamination and minimizes manual effort

- Sensitive -

Incorporates MyTaq HS DNA Polymerase that exhibits increased affinity for DNA, thereby improving yield of even the most challenging targets

- Specific -

MyTaq HS DNA Polymerase is an antibody- mediated hot-start enzyme that remains completely inactive during PCR set-up to prevent non-specific amplification

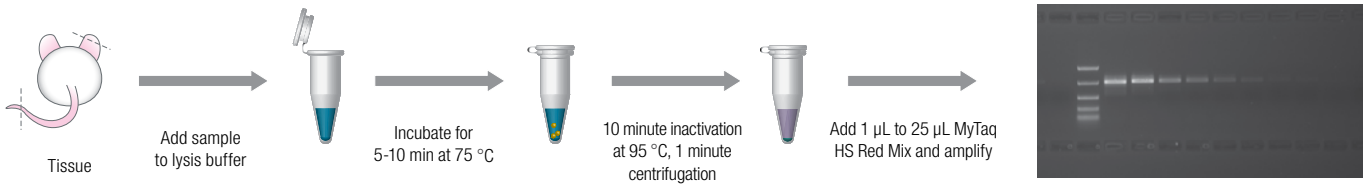
- Flexible -

Ideal for amplifying any target up to 5 kb from DNA extracted from mammalian tissue samples

Many DNA extraction methods can be laborious and time-consuming or involve the use of hazardous chemicals. MyTaq Extract-PCR Kit offers a rapid, easy and safer alternative for the extraction and amplification of DNA from a variety of tissue types. MyTaq Extract-PCR Kit is particularly suited to solid tissues such as mouse tail or mouse ear.

The extracted DNA is amplified in a proprietary buffer system using MyTaq HS Red Mix, the latest generation of very high-performance polymerase unique to Meridian. The advanced formulation of MyTaq HS Red Mix allows fast cycling conditions to be used, greatly reducing the reaction time without compromising PCR specificity or yield.

Biopsy samples for molecular genotyping techniques using PCR can be problematic owing to the presence of bone, cartilage and blood contaminants. MyTaq Extract-PCR Kit's superior extraction capabilities were demonstrated by subjecting a 3 mg snip of mouse tail to a rapid extraction and amplification protocol (Fig. 1).



Overview of the workflow, tissues can be ready for PCR in only 15 min

APPLICATIONS

HIGH-THROUGHPUT GENOTYPING · DETECTION OF TRANSGENES · KNOCKOUT ANALYSIS

"We tested the MyTaq Extract-PCR Kit for genotyping mice. The extraction was fast, easy to handle and the PCR reactions worked very well. We also used the kit for performing multiplex PCR and we obtained better results than with our conventional method"

Michael Mitterer, MPI for Immunology and Epigenetics

When processing these mouse tissue samples under the manufacturers' recommended reaction conditions, MyTaq Extract-PCR Kit consistently demonstrated greater sensitivity and higher yield than equivalent kits from other suppliers.

MyTaq Extract PCR-Kit uses a novel protease and buffer system that provides fast, simple and efficient lysis in a single tube. To demonstrate the quality of the DNA produced by MyTaq Extract-PCR Kit using a fast protocol, DNA was extracted and amplified from mouse tail using MyTaq Extract-PCR Kit and an equivalent kit from Supplier S. A 1 kb and 2 kb fragment of the same gene were amplified using the manufacturers' recommended reaction conditions, with the results demonstrating that MyTaq Extract-PCR Kit consistently generated superior yields under fast conditions (Fig. 2).

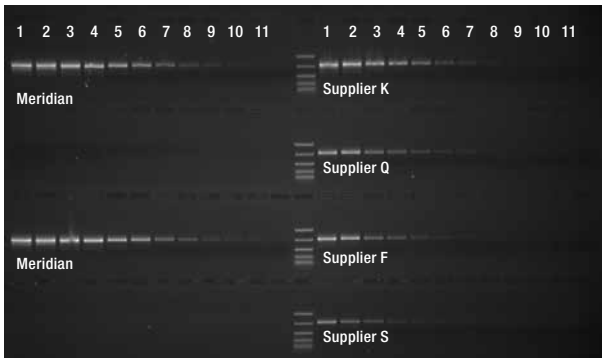


Fig. 1 Consistently High Yield
MyTaq Extract-PCR Kit and kits from other suppliers were used to extract and amplify genomic DNA from 3 mg of mouse tail according to the manufacturers' instructions. After extraction, a 2-fold serial dilution of the sample was amplified using primers for a 1 kb fragment from mouse γ-actin (Lanes 1-12, (EasyLadder I (M)). The results illustrate that the MyTaq Extract-PCR results in reproducibly high yields from these crudely extracted samples and was more sensitive than competing extraction and amplification kits tested.

Fig. 2 Fast Protocol
Genomic DNA was extracted from mouse tails using a 5 minute digestion at 75 °C, followed by a 10 minute neutralization at 95 °C (as specified in the manufacturers' instructions). After extraction, a two-fold serial dilution (Lanes 1—12, (EasyLadder I (M)) was used for the amplification of a 1 kb fragment (A) and a 2 kb fragment (B) from the mouse CTXN1 gene under fast PCR conditions. The results illustrate that the MyTaq Extract-PCR kit results in high yields with both small and larger fragments even under fast PCR conditions unlike alternative extraction and amplification kits tested.

Product	Size	Cat No.
MyTaq Extract-PCR Kit	100 Reactions	BIO-21126
	500 Reactions	BIO-21127

MyTaq™ Blood-PCR Kit

MyTaq Blood-PCR Kit offers very fast, highly-specific, direct PCR from a wide range of human and animal whole blood samples, including those preserved with anticoagulants.

- Fast -
eliminates complex, slow and costly DNA extraction steps, thereby reducing time to results

- Simple -
fewer protocol steps greatly reduce the risk of sample loss and contamination and minimizes manual effort

- Robust -
novel buffer system developed to overcome PCR inhibitors in blood

- Sensitive -
incorporates MyTaq HS DNA Polymerase that exhibits increased affinity for DNA, thereby improving yield of even the most challenging targets

- Flexible -
developed for a wide range of blood samples, including samples containing EDTA, citrate and heparin

- Versatile -
suitable for a range of PCR applications, including multiplexing, amplification of GC-rich templates and long amplicons

MyTaq Blood-PCR Kit is recommended for fast, specific and direct PCR from human and animal blood samples. The combination of a unique, inhibitor-tolerant buffer system and MyTaq HS DNA Polymerase, ensures MyTaq Blood-PCR Kit overcomes the PCR inhibitors typically present in blood samples, including anticoagulants (EDTA, citrate and heparin). This leads to significantly increased sensitivity and PCR success rates even with demanding applications such as long amplicons and GC-rich templates. In addition to supporting robust PCR amplification, the novel buffer system replaces the need for complicated extraction and purification steps or the use of additives.

The speed and high specificity of MyTaq Blood-PCR Kit makes it highly suited for multiplex PCR and high-throughput genotyping assays. The advanced formulation of MyTaq Blood-PCR Kit allows fast cycling conditions to be used, without compromising PCR specificity and yield.

Fig. 1 Amplification from human whole blood
An 844 bp fragment of the EGFR gene was amplified from human whole blood preserved with the anticoagulant lithium heparin. A 2-fold serial dilution from 20% blood was amplified in reactions using MyTaq Blood-PCR Kit and blood kits from suppliers K, T and N (lanes 1-12, HyperLadder 1 kb (M)), according to the manufacturers' standard protocol. The results illustrate the significantly improved yield at both higher and lower concentrations with MyTaq Blood-PCR Kit.

Product	Size	Cat No.
MyTaq Blood-PCR Kit	250 Reactions	BIO-25054

APPLICATIONS

GENOTYPING · GENETIC TESTING · PATHOGEN DETECTION · BLOOD SCREENING · PATERNITY TESTING

MyTaq™ Plant-PCR Kit

MyTaq Plant-PCR Kit offers fast, highly-specific, direct PCR from a wide range of plant leaf samples. The novel buffer system circumvents the need for additional PCR stabilizers and traditional purification steps, thereby avoiding complex extraction process.

- Fast -

Eliminate complex, slow and costly DNA extraction steps, thereby reducing time to results

- Sensitive -

Incorporates MyTaq HS DNA Polymerase that exhibits increased affinity for DNA, improving yield even the most challenging targets

- Robust -

Specially developed to overcome common plant-derived PCR inhibitors such as polyphenolics and polysaccharides for highest PCR success rates and improved sensitivity

- Versatile -

Perfect for a wide range of plant species, avoiding the need for further optimization, thereby minimizing setup time and reducing cost

- Simple -

Ideal for fast genotyping in plant genetic studies, mutation detection, confirming transgenic plant and knockout analysis

The presence of inhibitors in plant tissues such as complex polysaccharides, polyphenols and humic acids, as well as template/primer inaccessibility or degradation in the crude sample means that native DNA polymerases are inhibited by relatively small amounts of plant tissue, making direct PCR from plants a challenge. MyTaq Plant-PCR Kit features a novel, proprietary buffer system that has been specifically developed to overcome these PCR inhibitors (Fig. 1), offering significant improvements in yield and sensitivity.

MyTaq Plant-PCR Kit streamlined workflow and highly optimized buffer system result in reproducible higher yields, even with plant leaves rich in PCR inhibitors such as anthocyanin, flavonol and phenolic acids (found in tomato leaves), or with tough leaves (rice and sugarcane leaves), that normally require complex reaction processes (Fig. 1).

Product	Size	Cat No.
MyTaq Plant-PCR Kit	250 Reactions	BIO-25055
	500 Reactions	BIO-25056

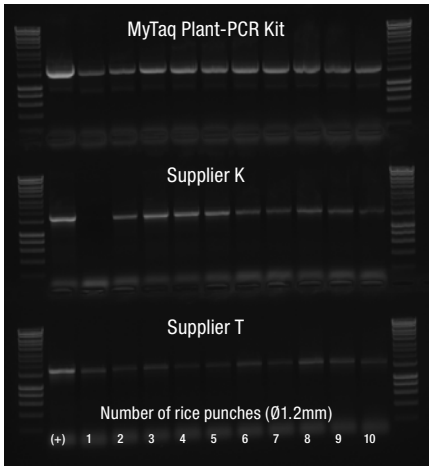


Fig. 1 Increasing concentration of inhibitors in a reaction
Amplification of 0.5 kb fragments, from between 1 and 10 rice leaf punches (1.2 mm). 50 µL PCR reactions were set up using the MyTaq Plant-PCR Kit and kits from supplier K and T. The thermal cycling conditions were set according to the manufacturers' recommendations. Increasing the number of leaf punches also increases the concentration of inhibitors in the reaction. The results illustrate that MyTaq Plant-PCR Kit is better at coping with increasing inhibition than other kits, without compromising the PCR efficiency. (+) Control reaction with purified DNA. MW marker HyperLadder 1 kb.

APPLICATIONS

GENOTYPING FOR PLANT GENETIC STUDY · MUTATION DETECTION · TRANSGENIC DETECTION · KNOCKOUT ANALYSIS

Product	Size	Cat No.
DNA Polymerases for Routine Applications		
MyTaq DNA Polymerase	500 Units	BIO-21105
	2500 Units	BIO-21106
	5000 Units	BIO-21107
MyTaq Red DNA Polymerase	500 Units	BIO-21108
	2500 Units	BIO-21109
	5000 Units	BIO-21110
MyTaq Mix, 2x	200 Reactions	BIO-25041
	1000 Reactions	BIO-25042
MyTaq Red Mix, 2x	200 Reactions	BIO-25043
	1000 Reactions	BIO-25044
Hot-Start DNA Polymerases		
MyTaq HS DNA Polymerase	250 Units	BIO-21111
	1000 Units	BIO-21112
	2500 Units	BIO-21113
MyTaq HS Red DNA Polymerase	1000 Units	BIO-21115
	2500 Units	BIO-21116
MyTaq HS Mix, 2x	200 Reactions	BIO-25045
	1000 Reactions	BIO-25046
MyTaq HS Red Mix, 2x	200 Reactions	BIO-25047
	1000 Reactions	BIO-25048
MyFi DNA Polymerase	250 Units	BIO-21117
	500 Units	BIO-21118
	2500 Units	BIO-21119
MyFi Mix	100 Reactions	BIO-25049
	500 Reactions	BIO-25050
IMMOLASE DNA Polymerase	250 Units	BIO-21046
	500 Units	BIO-21047
ImmoMix	500 Reactions	BIO-25020
ImmoMix Red	500 Reactions	BIO-25022

Product	Size	Cat No.
High Fidelity Polymerases		
VELOCITY DNA Polymerase	250 Units	BIO-21098
	500 Units	BIO-21099
SimpliFi HS Mix, 2x	100 Reactions	BIO-25060
	500 Reactions	BIO-25061
ACCUZYME DNA Polymerase	500 Units	BIO-21052
ACCUZYME Mix	500 Reactions	BIO-25028
DNA Polymerases for Longer Amplicons		
RANGER DNA Polymerase	250 Units	BIO-21121
	500 Units	BIO-21122
RANGER Mix	500 reactions	BIO-25052
Reverse Transcription PCR		
MyTaq One-Step RT-PCR Kit	25 Reactions	BIO-65048
	100 Reactions	BIO-65049
Direct PCR Kits		
MyTaq Extract-PCR Kit	100 Reactions	BIO-21126
	500 Reactions	BIO-21127
MyTaq Blood-PCR Kit	250 Reactions	BIO-25054
MyTaq Plant-PCR Kit	250 Reactions	BIO-25055
	500 Reactions	BIO-25056

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