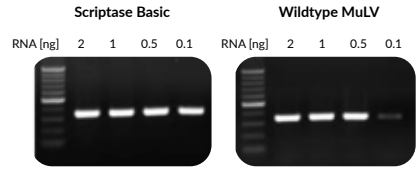
(q)PCR ENZYMES

FastGene® Scriptase Basic

Perfect Enzymes for Reverse Transcription

- **Reverse transcriptase for the quantification of gene expression**
- **RNase inhibitor included**
- **For high DNA concentrations**
- **Enzyme only or cDNA Synthesis Kit**



The FastGene® Scriptase Basic shows higher sensitivity when compared to wildtype MuLV. The Scriptase Basic is able to produce a template from RNA concentrations as low as 0.1 ng.

Enzyme only or cDNA Synthesis Kit

The FastGene® Scriptase Basic is available in two forms: Enzyme only contains the enzyme, buffer and dNTPs. The cDNA Synthesis Kit, additionally comes with Oligo dTs, random hexamers and RNase inhibitor.

Designed for endpoint RT-PCR

The FastGene® Scriptase Basic was designed for large RNA quantities, typically used in an endpoint RT-PCR. Nonetheless, it is also able to process lower RNA concentrations.

Optimized for better performance

The FastGene® Scriptase Basic is an enhanced version of the Murine Leukemia Virus (MuLV) reverse transcriptase. Like the wildtype, it has the ability to synthesize a cDNA strand, with a reduced RNase H activity and processivity. The robustness of the enzyme was greatly increased. It is perfectly suited for large RNA quantities and easy templates.

No inhibition - Even at large RNA concentration

The special buffer formulation permits a high RNA concentration. Other reverse transcriptases are not able to process such large quantities.

Ordering information

Cat. No.	Product	Content
LS52	FastGene® Scriptase Basic (20,000 units at 200 U/µl) (Includes: enzyme, buffer, dNTPs and sterile water)	100 rxn
LS62	FastGene® Scriptase Basic cDNA Synthesis Kit (Kit includes: enzyme, buffer, dNTPs, sterile water, RNase inhibitor, oligo dTs and random hexamers)	100 rxn

FastGene® Scriptase II

Perfect Enzymes for Reverse Transcription

- **Reverse transcriptase for the quantification of gene expression**
- **Very low RNase H activity**
- **High yield of full-length cDNA**
- **Synthesis of cDNA from very low amounts of RNA**

Everything you need for your reverse transcription

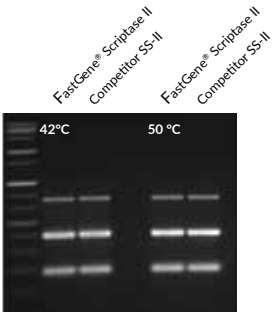
The FastGene® Scriptase II cDNA Synthesis Kit includes all necessary components to perform a reverse transcription. The kit contains the Scriptase II enzyme, buffer, DTT, dNTPs, RNase inhibitor, random hexamer and oligo dTs.

The Scriptase II is also available in two 5x ready-to-use mixes!

Have a look on the next page!

Engineered enyzme for better performance

The reverse transcriptase Scriptase II from FastGene® allows the synthesis of cDNA from very low RNA quantities. The FastGene® Scriptase II contains mutations within the RNase H domain of the MuLV's reverse transcriptase. By reducing the degradation of the RNA during the first-strand synthesis, a higher yield of full-length cDNA is obtained.
The FastGene® Scriptase II delivers superior cDNA templates for downstream applications, e.g. qPCR and NGS. The resulting full length cDNA gives a complete picture of the gene and is able to show modifications, e.g. splicing variants.

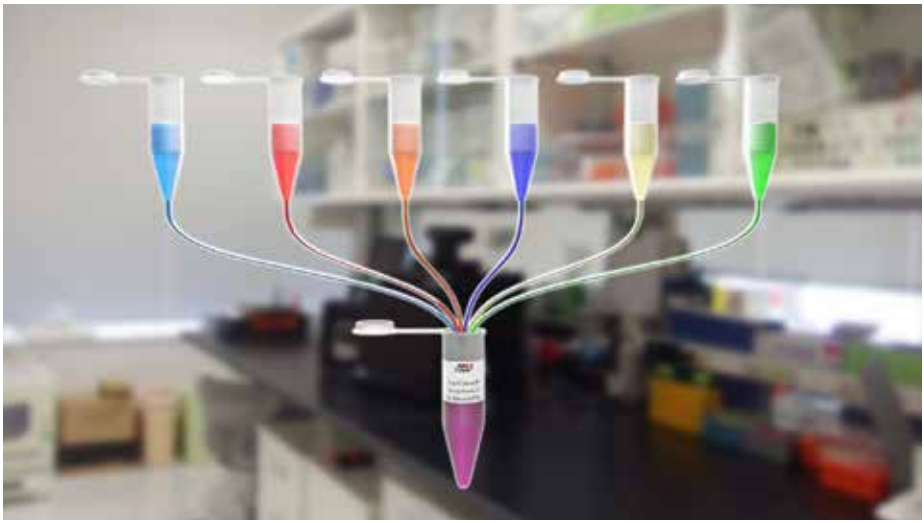


Comparison of multiplex PCR using cDNA produced by Competitor SS-II enzyme and FastGene® Scriptase II at 42°C and 50 °C.

Ordering information

Cat. No.	Product	Content
LS53	FastGene® Scriptase II (20.000 units at 200 U/µl) (Includes: enzyme, buffer, DTT, dNTPs and sterile water)	100 rxn
LS63	FastGene® Scriptase II cDNA Synthesis Kit (Kit includes: enzyme, buffer, DTT, dNTPs, sterile water, RNase inhibitor, oligo dTs and random hexamers)	100 rxn

FastGene® Scriptase II ReadyMix

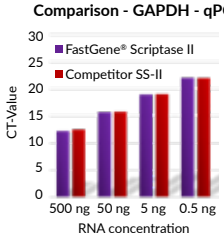


Reverse transcription: Ready-to-use

The FastGene® Scriptase II cDNA Synthesis 5x ReadyMix is ready-to-use with all necessary ingredients in just one vial. Just add the Scriptase II ReadyMix to your template and start the reaction.

Mixes with or without oligo dTs

The FastGene® Scriptase II ReadyMix is available in two variants. LS64 contains random hexamers and is suitable for prokaryotic systems. The LS65 mix additionally contains oligo dT primers that are able to bind to poly(A) tails of mRNA. This makes the mix perfectly suitable for eukaryotic systems.



Comparison of qPCR results using primers for GAPDH produced by using different RNA starting concentration by FastGene® Scriptase II and competitor SS-II enzyme at 42°C.

Customer Testimonial

"I especially like that the Scriptase II leads to stable results. As a result of performing RT-PCR using tumor derived RNA, we were able to detect the expression of genes, where the amplification was unstable with other RT reagents. The amplification of full-length cDNA has also been confirmed. I would love to also try the 5x ReadyMix."

Haruko Hayasaka
Department of Bioscience and Biotechnology,
Kinki University, Osaka, Japan

★★★★★

Ordering information

Cat. No.	Product	Content
LS64	FastGene® Scriptase II cDNA Synthesis 5x ReadyMix (Mix contains: enzyme, buffer, dNTPs, RNase inhibitor, random hexamers and helper protein)	100 rxn
LS65	FastGene® Scriptase II cDNA Synthesis 5x ReadyMix OdT (Mix contains: enzyme, buffer, dNTPs, RNase inhibitor, random hexamers, helper protein and oligo dTs)	100 rxn

Technical Data

Very fast reverse transcription reactions

Purpose

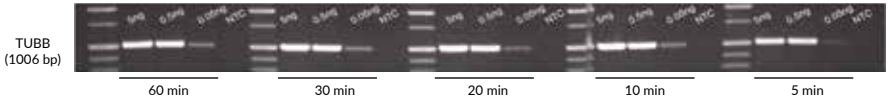
FastGene® Scriptase II is an engineered reverse transcriptase, able to deliver highest quality cDNA from a small amount of RNA. Optimization of enzymatic design has led to one of the most reactive RT-enzymes. This technical note shows the investigation of the minimum time possible of a reverse transcription. We were able to shorten time to 5 minutes with different concentrations of RNA. The resulting cDNA was used in endpoint PCR as well as in qPCR experiments.

Method

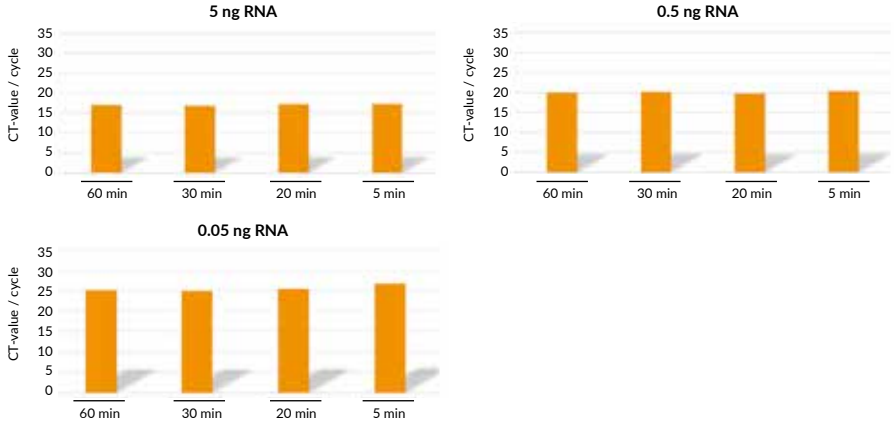
- FastGene® Scriptase II cDNA Synthesis Kit (LS63)
- RNA: Universal Human Reference RNA (Agilent Technologies) Input RNA amount: 5 ng, 0.5 ng, 0.05 ng
- Primer:
    - TUBB (1006 bp): Endpoint PCR
    - GAPDH (138 bp): qPCR

Result

1 Endpoint PCR



2 Quantitative PCR



Conclusion

FastGene® Scriptase II was able to produce cDNA in 5 minutes.
Result 1: For large PCR products, the band of 0.05 ng RNA after 5 min was slightly weaker. Hence, for products of 1000 bp a 10 min RT step is recommended for low RNA amounts.
Result 2: No difference in CT-value exceeding ± 1 cycle was detected.
FastGene® Scriptase II can therefore be recommended for short-term reverse transcripton reactions.

FastGene® HiFi DNA Polymerase

Deal with the most challenging PCRs

New

- **Extremely accurate and fast**
- **For challenging GC or AT rich sequences**
- **Generates high yields with blunt ends**
- **Amplifies up to 17.5 kb**
- **Master Mix with advanced buffer system**

Perfect for challenging PCRs

The FastGene® HiFi Polymerase is the high fidelity enzyme for precise PCR amplifications. The enzyme was engineered in a way that it can amplify particularly long templates (up to 17.5 kb) with a high sequence accuracy. Furthermore, it shows a significant improvement in extension times (10-30 sec per kb), while generating high yields, even with difficult templates.

Save time with the master mix

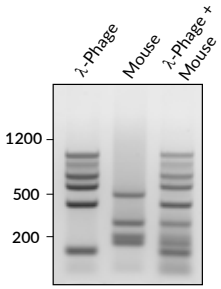
The FastGene® HiFi Polymerase is provided in a 2x Master Mix, which significantly speeds up the preparation of a PCR. It contains an advanced buffering system with dNTPs, Mg2+, reaction enhancers and the polymerase enzyme.

High fidelity is key

The high fidelity of the FastGene® HiFi polymerase is based on the improved 3`-5` exonuclease activity, which significantly reduces the error rate of the enzyme and makes it around 100 times more accurate than a Taq DNA polymerase.

Made for precise applications

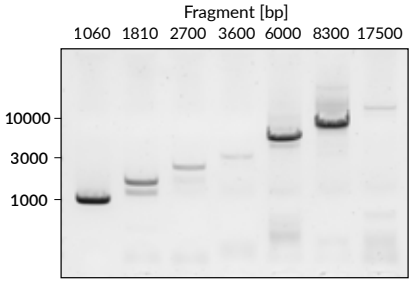
The FastGene® HiFi polymerase is working extremely accurate and fast. This is ideal for applications where high fidelity is essential, such as sequencing, cloning and site-directed mutagenesis.



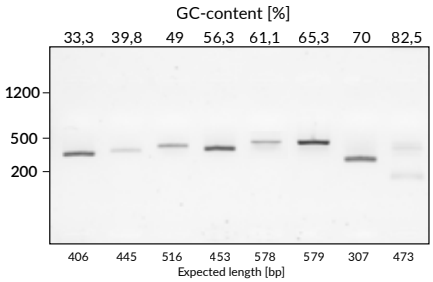
The FastGene® HiFi Polymerase Mix can be used for multiplexing PCR. In this experiment, 6 phage DNA fragments, 4 mouse DNA fragments and a combination of both were successfully amplified in a single reaction mix.

FastGene® HiFi DNA Polymerase

Deal with the most challenging PCRs



The FastGene® HiFi Polymerase Mix is capable of amplifying a long range of fragments, even up to 17,500 bp.

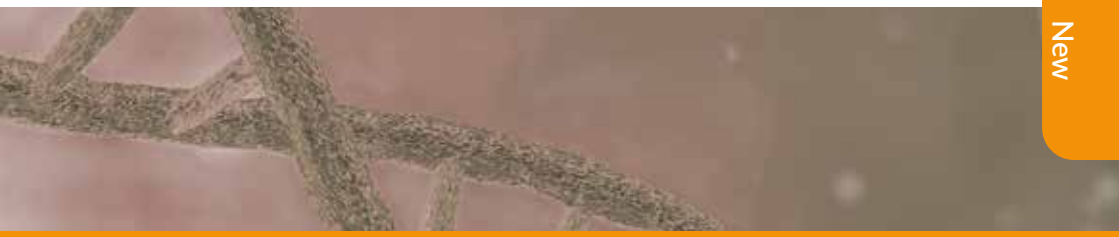


Templates with varying GC-contect, ranging from ~30 % to ~80 % can be successfully amplified with the FastGene® HiFi Polymerase Mix.

Ordering information

Cat. No.	Product	Content
LS36	FastGene® HiFi 2x HS Master Mix	100 rxn

New



Enhance your PCR with HiFi

You would like to test our DNA polymerase? No problem! Just give us a call or write us an email and get your free sample very soon.

+49 2421 554960

info@nippongenetics.de

www.nippongenetics.eu

FastGene® Optima HotStart ReadyMix

- **Proofreading DNA polymerase**
- **ReadyMix - Just add your template and primer**
- **For complex templates**
- **HotStart enzyme for highest specificity**
- **Problem solver**

Processivity, fidelity and big fragments

The FastGene® Optima polymerase is a mixture of two different types of PCR enzymes – a Taq polymerase and a modified type-B polymerase with excellent proof-reading abilities. Each enzyme is purified using three different chromatography technologies. This results in very high enzyme purity and activity. Optima is extremely robust, making it ideal for a broad range of PCR applications. Standard PCR, challenging PCR, and very long amplicons (over 7.5 kb) are easily handled by this enzyme mixture.

Optimal efficiency for GC-rich templates

Most polymerases have a low amplification efficiency, if the template DNA is GC-rich. As seen in Fig. 2, the FastGene® Optima has an excellent amplification efficiency even with GC rich templates. The efficiency of the FastGene® Optima is even higher than the efficiency of polymerases specially designed for GC-rich templates (Fig. 2).

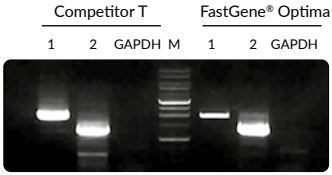


Fig. 2: Comparing the ability of Competitor T and FastGene® Optima polymerase mixture to amplify GC-rich DNA fragments. Two fragments with 60.7% GC and 64.3% GC were amplified, resulting in two products of 1839 bp and 1260 bp, respectively. FastGene® Optima had a higher efficiency compared to Competitor T's polymerase mixture.

Optimal robustness for very complex samples

The FastGene® Optima can easily handle very complicated templates. The highly purified Taq polymerase gives great efficiency while the proof-reading polymerase guarantees the fidelity. The robustness of both enzymes makes the amplification of complex tissue, such as liver tissue (Fig. 1), possible.

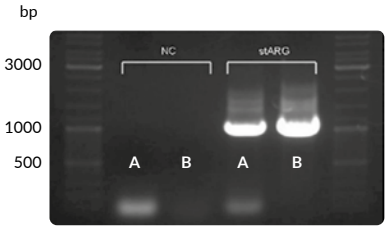


Fig. 1: The comparison between (A) the "best-selling" blended Taq mix and (B) FastGene® Optima polymerase mixture uses with catshark liver DNA (hard to amplify) as a template. The PCR product with a size of 1030 bp was separated on a 1.2% agarose gel. The FastGene® Optima produces less primer dimers and has a higher amplification efficiency.

Robustness "of a Rhino" is the key advantage of the Optima DNA polymerase. Do you have any problems with your PCR? Just try the Optima - you will get reliable and reproducible results. Anytime!

Ordering information

Cat. No.	Product	Content
LS29	FastGene® Optima HotStart ReadyMix	500 x 25 µl reactions (6.25 ml total volume)

FastGene® Optima HotStart ReadyMix

Optimal for SNP-typing

The detection of single nucleotide polymorphism (SNP) requires extreme fidelity, which is guaranteed by the proof-reading activity of the FastGene® Optima (Fig. 3).

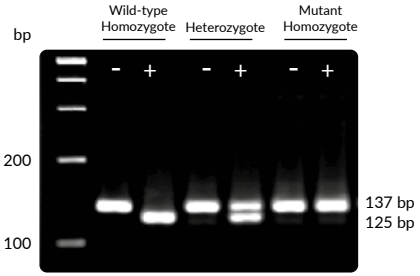


Fig. 3: SNP typing of the ALDH gene using FastGene® Optima polymerase. The ALDH gene, classified as human sensitivity to alcohol, was analysed for presence of SNP by digesting the amplification of homo- and heterozygotes using MboII.

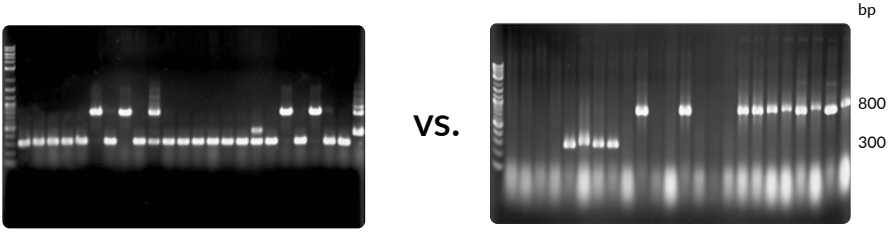
HotStart - It is your decision when to start

For labs preferring low primer-dimers and an easy room temperature set-up, the HotStart-version of the FastGene® Optima is the best choice. Designed as a master mix, the Optima HotStart ReadyMix combines the superb efficiency and robustness of the Optima enzyme mix with a proprietary antibody that inhibits a preliminary unspecific reaction. This antibody is permanently denatured during the primary PCR activation step. The HotStart ReadyMix comes with all the necessary ingredients for an optimal PCR. Just add your template and primers. Additionally, the ReadyMix includes a loading dye, so that the PCR sample can be directly loaded onto an agarose gel.

Applications

- RT-PCR
- Very complex templates
- GC-rich templates
- SNP Analysis
- Multiplex PCR
- Any standard PCR application

Direct PCR from E. coli colonies



Direct PCR from E. coli colonies using FastGene® Optima HotStart ReadyMix (left gel) or "best-selling" blended Taq mix (right gel). The ReadyMixes were used to determine the presence or absence of inserts. The Optima HotStart ReadyMix yielded a clear electrophoretic pattern without smearing. In addition, Optima was able to amplify clean product from EVERY colony. The competitor was not able to amplify 10 colonies.

Customer Testimonial

"We tested very successfully the HotStart ReadyMix for duplex-PCR of cDNAs from our knock-down mutants. The PCR reactions show no unspecific products. Additionally this product has an excellent price performance ratio"

Dr. Matthias Schmidt
Institute for Molecular Life Science
Goethe University, Frankfurt, Germany

★★★★★

FastGene® BAC-free Taq

- **DNA polymerase with no bacterial contamination**
- **Prevents false positive PCR results from bacterial DNA**
- **Perfect for bacterial genome analysis**

Free of any bacterial contamination

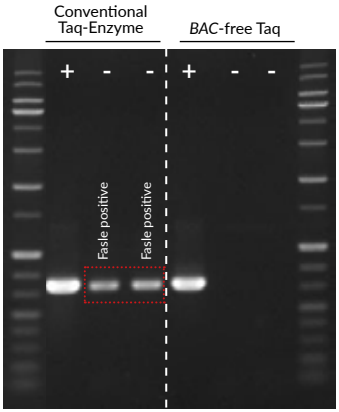
The FastGene® BAC-free HotStart Taq DNA polymerase is based on the single-subunit, wild-type Taq DNA polymerase of the thermophilic bacterium Thermus aquaticus, but is purified from an eukaryotic recombinant expression system. Contaminating DNA, present in most other polymerase preparations, often precludes the accurate interpretation of results, especially when targeting conserved sequences (e.g. the bacterial 16S rRNA region).

Eukaryotic expression system - No more false positive

Performing PCR with bacterial templates could lead to a false positive result, when using Taq enzymes purified from E. coli expression systems due to a contamination of the Taq enzyme with prokaryotic genomes. The FastGene® BAC free HotStart Taq DNA Polymerase is produced using eukaryotic cells. Hence, no bacterial genome is present.

Applications

- Bacterial genome analysis
- Pathogen detection
- Amplification of low copy DNA templates
- Multiplex PCR
- Specific amplification of complex templates
- RT-PCR



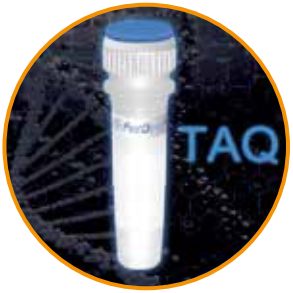
Amplification of a non-ribosomal gene using E. coli DNA (+) or no template control. The no template control (-) was amplified with standard Taq and FastGene® BAC-free HS Taq. The conventional Taq produced a PCR-product despite no tempate being present, while no product was detected using the FastGene® BAC-free HS Taq. This indicates a bacterial genomic DNA contamination of the conventional Taq polymerase.

Best choice for 16S/23S microbial screening, E. coli contamination and forensic studies.

Ordering information

Cat. No.	Product	Content
LS33	FastGene® BAC-free HotStart Taq Polymerase	500 Units

FastGene® Taq DNA Polymerase



Taq polymerase with a high purity

The FastGene® DNA Polymerase is based on the single subunit, wild-type Taq DNA polymerase of the thermophilic bacterium Thermus aquaticus. The enzyme is purified using three different chromatography technologies and results in a very high purity and activity.

Two different reaction buffers

The enzyme comes with 2 different reaction buffers. Buffer A is a "high yield" buffer, for most amplicons. Buffer B is a standard KCl-based Taq buffer with a higher sensitivity.

Customer Testimonial

"We are happily using the FastGene® Taq DNA polymerase for over 12 months for routine SNP-analysis. We have chosen FastGene® Taq DNA polymerase since we needed a robust and reliable polymerase. We are very happy with it and the price-performance ratio is excellent!"

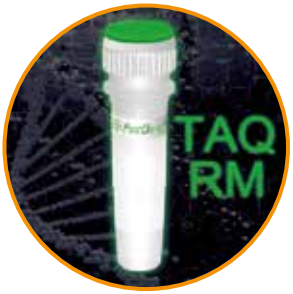
Dr. J. Wagner
PlantaLyt GmbH, Hannover, Germany

★★★★★

Ordering information

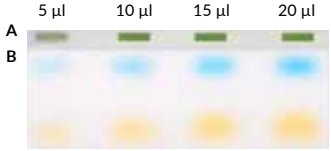
Cat. No.	Product	Content
LS21	FastGene® TAQ DNA polymerase	500 Units
LS22	FastGene® TAQ DNA polymerase	2000 Units

FastGene® Taq Ready Mix



Everything you need for your PCR

The FastGene® Taq ReadyMix (2X) is a ready-to-use cocktail with two inert tracking dyes and containing all components for PCR, except for primers and template. The 2X ReadyMix contains FastGene® Taq DNA polymerase, Taq buffer, dNTPs, $MgCl_2$ and stabilizers.



FastGene® Taq reactions with 1X loading dye reaction buffer. (A) Volumes above wells indicate the volume of the PCR reaction loaded on the gel. (B) On a 1% agarose gel, the blue dye migration corresponds to a 5 kb DNA fragment, and the yellow dye migrates at 75 bp.

Ordering information

Cat. No.	Product	Content
LS26	FastGene® Taq Ready Mix PCR Kit	50 x 50 µl reactions
LS27	FastGene® Taq Ready Mix PCR Kit	250 x 50 µl reactions

DNAreleasy Advance

- **PCR done the easy way**
- **Successful lysis of different biological material**
- **Very easy-to-use**

From cells to PCR in 15 minutes

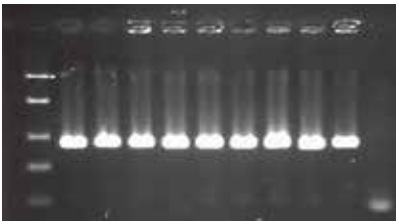
Are you tired of the time-consuming extraction processes and costly spin columns that you've been using to prepare samples for DNA amplification? With the DNAreleasy Advance Direct Lysis Kit, we now offer a better solution. The new cell lysing reagent only requires a 15 minutes incubation in a thermal cycler before the DNA is ready-to-use directly for your PCR – without any further sample processing!

Successfully used samples

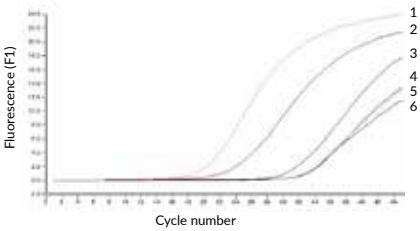
- Saliva
- Hair roots
- Animal tissue (horse, pig liver, etc.)
- Mouse tails and ears
- Plants (leaf, blossom, pollem): Cabbage, maize, canola, soy, sugar beet, etc.
- Drosophila
- Yeast
- Mollusca

Easy procedure

Using DNAreleasy Advance is really easy. Just mix cells with 20 µl of the reagent, place in a a thermal cycler or incubator and heat at 65°C for 5 minutes, followed by 96°C for 5 minutes before holding at 20 °C for 5 minutes. After the lysis, a part or all of the lysate can be added directly to your PCR mix or it can be stored at -20 °C for future use.



Genomic DNA from scallops was isolated with DNAreleasy Advance, and a part of the supernatant was directly added to the PCR reaction. The agarose gel shows the high yield obtained.



Genomic DNA was isolated using DNAreleasy Advance and analyzed by qPCR: (1) positive control human DNA, (2) saliva, (3) hair root, (4) pig liver, (5) drosophila melanogaster, (6) horse meat.

Ordering information

Cat. No.	Product	Content
LS05	DNAreleasy Advance	300 µl, 10 reactions
LS06	DNAreleasy Advance	1.5 ml, 50 reactions

FastGene® IC Green qPCR Universal Kit

No inhibition - For highest sensitivity

It is well-known that SYBR® Green is extensively inhibiting the qPCR. This fact led to the development of SYBR® resistant enzymes. An alternative approach is to develop a dye that does not inhibit the reaction. This dye is named FastGene® IC Green. FastGene® IC Green is an intercalating dye, only detecting double stranded DNA. By not inhibiting the reaction, the FastGene® IC Green Kit is able to detect genes at a lower CT-value, creating a higher sensitivity!

The superior buffer chemistry enables the detection of low copy number genes, which could not be detected with other dyes. The comparison to competitors shows that FastGene® IC Green is one of the best qPCR mixes available. This has been confirmed by customers analysing various genes.

Universal - for any qPCR instrument

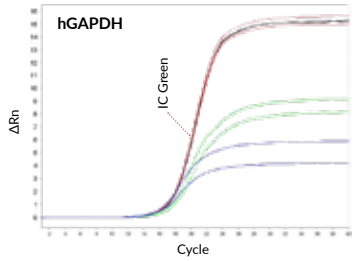
The FastGene® IC Green Kit is universal. The reference dyes come in a separate vial and can be added to the master mixes once. Hence, this kit can be used with qPCR instruments which need a high ROX™ concentration as well as instruments that need a low concentration or no ROX™. A special version with fluorescein is also available

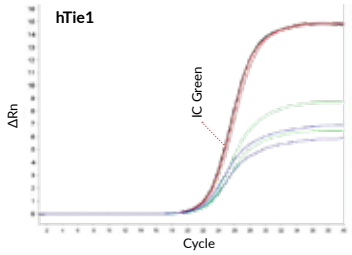
Robust chemistry for faster results

The FastGene® IC Green buffers were designed to have a superior robustness. This guarantees the linearity of the qPCR and creates a better accuracy, essential for reproducible results. Additionally, qPCRs can be performed at shorter amplification times, for example using fast protocols.

Applications

- Quantification of gene expression
- Quantification of gene copy number
- Melt-curve analysis
- Detection of gene expression (knock-out analysis)





Comparison of FastGene® IC Green (black & red) with the market leading competitors KB (green) and T (blue). The differences of the C_T-values were under 1 cycle.

Ordering information

Cat. No.	Product	Content
LS4001	FastGene® 2x IC Green Universal (ROX™)	100 reactions
LS4005	FastGene® 2x IC Green Universal (ROX™)	500 reactions
LS4050	FastGene® 2x IC Green Universal (ROX™)	5000 reactions
LS4101	FastGene® 2x IC Green Universal (Fluorescein)	100 reactions
LS4105	FastGene® 2x IC Green Universal (Fluorescein)	500 reactions
LS4150	FastGene® 2x IC Green Universal (Fluorescein)	5000 reactions

FastGene® Probe qPCR Universal Kit

Save time with fast protocols

The unique buffer composition enables a faster reaction: apply a fast protocol, available on many modern qPCR instruments, and save plenty of time.

Perfect efficiency

For the FastGene® Probe qCPR, use hydrolysis probes, enabling multiplex, and leading to very specific signal and low to none background fluorescence. The buffer chemistry, combined with optimal primer design, is the most important part of a Probe assay based reaction. Here we present the superior buffer system of the FastGene® Probe Universal Kit.

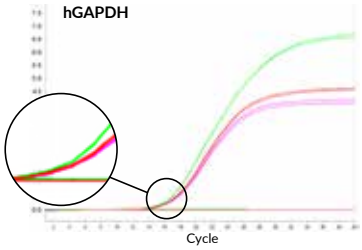
Get a very high dynamic range and reproducible results by using the FastGene® Probe Universal mix. Achieve higher efficiencies and more accurate results.

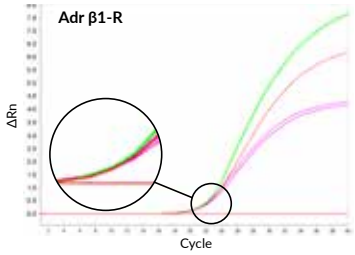
Robust chemistry for multiplexing

The robustness of the buffer ensures the ability to perform multiplex qPCR. Get the highest sensitivity for multiple targets using the FastGene® Probe Universal Kit. The FastGene® Probe Universal Kit is compatible with all real time PCR instruments.

Applications

- Quantification of gene expression
- Quantification of gene copy number
- Multiplex qPCR
- SNP genotyping
- NGS validation





Reactions (25 µl) were set up according to manufacturer's instructions, with 25 ng of hgDNA as template, and 0.5 µM of each primer. PCR was performed for a total of 35 cycles. Green: Competitor KB. Red: Competitor T. Pink: Probe qPCR Universal Kit.

Ordering information

Cat. No.	Product	Content
LS4501	FastGene® 2x Probe Universal (ROX™)	100 reactions
LS4505	FastGene® 2x Probe Universal (ROX™)	500 reactions
LS4550	FastGene® 2x Probe Universal (ROX™)	5000 reactions

FastGene® IC Green 1-Step RT-qPCR

Robust chemistry for 2 reactions in one tube

The FastGene® IC Green 1-Step mix contains a reverse transcriptase and a DNA polymerase. Having a 1-tube reaction setup for the reverse transcription and for the quantitative PCR has many advantages: 1) The 2x master mix ensures the same concentration of buffer and enzyme when performing the experiment multiple times, 2) it is less prone to wrong mixtures of the reaction mix contents, 3) higher convenience due to less preparation time, and many more.

Applications

- Quantification of gene expression
- Quantification of gene copy number
- Melt-curve analysis
- Detection of gene expression (knock-out analysis)

Ordering information

Cat. No.	Product	Content
LS4301LR	2x FastGene® IC Green 1-Step Mix (low ROX™)	1 ml (100 reactions)
LS4305LR	2x FastGene® IC Green 1-Step Mix (low ROX™)	5 x 1 ml (500 reactions)
LS4301HR	2x FastGene® IC Green 1-Step Mix (high ROX™)	1 ml (100 reactions)
LS4305HR	2x FastGene® IC Green 1-Step Mix (high ROX™)	5 x 1 ml (500 reactions)

FastGene® Probe 1-Step RT-qPCR

High-performance enzymes for incredible sensitivity

The FastGene® Probe 1-Step Mix was developed for the rapid detection of multiple gene expressions using multiplex qPCR directly from RNA. The optimal conditions for the reverse transcription as well as for the DNA polymerisation ensures highest sensitivity and the detection of low copy genes.

Applications

- Quantification of gene expression
- Quantification of gene copy number
- Multiplex qPCR
- SNP genotyping
- NGS validation

Ordering information

Cat. No.	Product	Content
LS4701LR	2x FastGene® Probe 1-Step Mix (low ROX™)	1 ml (100 reactions)
LS4705LR	2x FastGene® Probe 1-Step Mix (low ROX™)	5 x 1 ml (500 reactions)
LS4701HR	2x FastGene® Probe 1-Step Mix (high ROX™)	1 ml (100 reactions)
LS4705HR	2x FastGene® Probe 1-Step Mix (high ROX™)	5 x 1 ml (500 reactions)