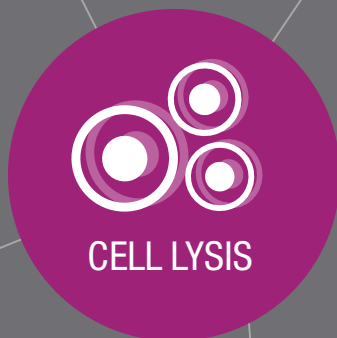




Amplification Reagents and Plastics

BIO-RAD

PCR AND GENE EXPRESSION WORKFLOW



1

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- One-Step and Two-Step SYBR® Green or Probes Formats



2

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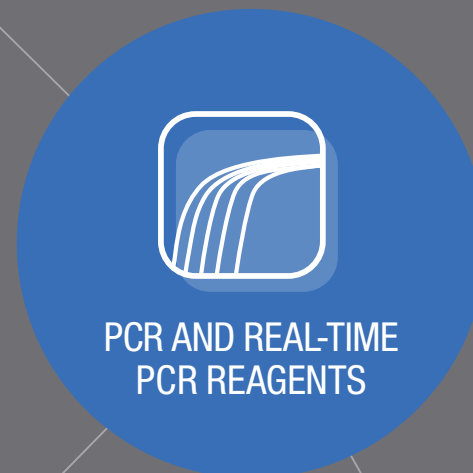
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- Aurum™ Sample Preparation Kits and PureZOL™ RNA Isolation Reagent
- Ordering Information



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- cDNA Synthesis Reagents
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1 CELL LYSIS

SingleShot™ Cell Lysis RT-qPCR Kits provide a complete and fast solution for generation of lysates from cell cultures. These lysates are optimized for downstream one- or two-step quantitative PCR (qPCR) reactions, and do not require an RNA purification step.

- Ready-to-use cell lysate up to 100,000 cells in 20 minutes
- Simple protocol for automated, high-throughput reverse transcription qPCR (RT-qPCR) experiments
- Available in one- or two-step SYBR® Green or probes kits

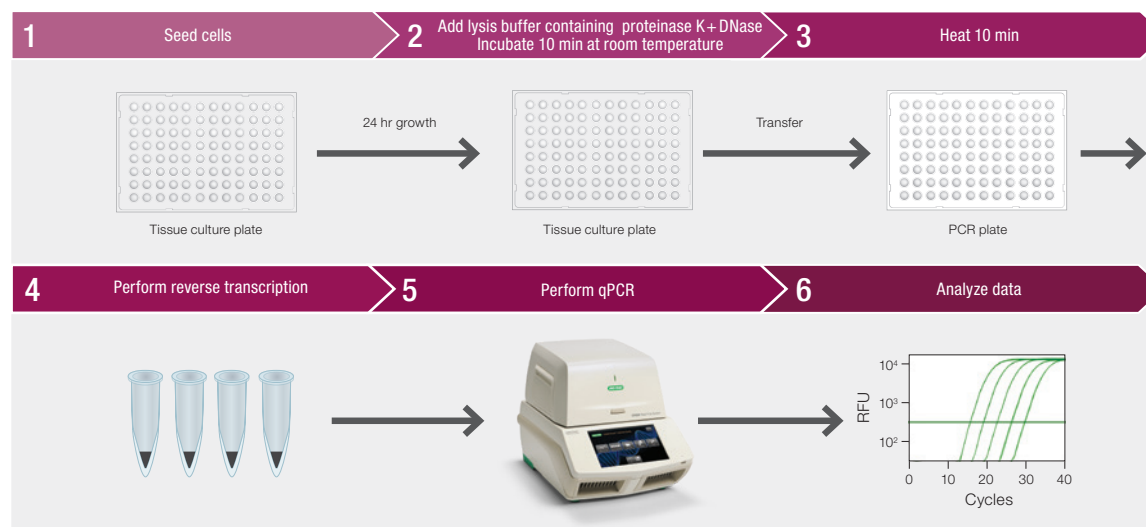
SingleShot™ Cell Lysis RT-qPCR Kits

All SingleShot Cell Lysis RT-qPCR Kits feature:

- Complete removal of genomic DNA (gDNA) without the need for purification
- Preservation of RNA integrity by our potent blend of RNase inhibitors
- No loss of rare transcripts from column purification
- Optimal accuracy and high sensitivity of qPCR data
- Validated to be compatible with PrimePCR™ Assays and Panels in preamplification workflows using PrimePCR PreAmp Assays
- Comparable results to those obtained when using purified RNA

SingleShot Kits are available in the following formats:

- SingleShot Cell Lysis Kits
- SingleShot Cell Lysis Two-Step RT-qPCR Kits
- SingleShot Cell Lysis One-Step RT-qPCR Kits



SingleShot workflow.

SingleShot Kit	Features	Product Options
Cell Lysis Kits	<ul style="list-style-type: none"> ▪ Cell lysis for RT-qPCR ▪ RT-qPCR reagents sold separately ▪ No RNA purification needed 	100 reactions, catalog #1725080 500 reactions, catalog #1725081
Cell Lysis Two-Step RT-qPCR Kits	<ul style="list-style-type: none"> ▪ Cell lysis, reverse transcription, and qPCR ▪ iScript™ Advanced cDNA Synthesis Kit for RT-qPCR included ▪ SsoAdvanced™ Universal Supermix included ▪ No RNA purification needed 	SYBR® Green, 100 reactions, catalog #1725085 Probes, 100 reactions, catalog #1725090
Cell Lysis One-Step RT-qPCR Kits	<ul style="list-style-type: none"> ▪ Cell lysis, reverse transcription, and qPCR ▪ iTaq™ Universal One-Step Kit included ▪ No RNA purification needed 	SYBR® Green, 100 reactions, catalog #1725095 Probes, 100 reactions, catalog #1725070

1 CELL LYSIS

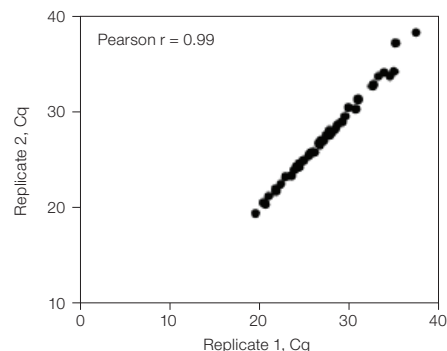
One-Step and Two-Step SYBR® Green or Probes Formats

One-Step and Two-Step SYBR® Green or Probes Formats

SingleShot™ Cell Lysis Kits

- Kits rapidly generate cell lysates that are optimized for RT-qPCR analysis without RNA purification
- Superior gDNA removal while preserving RNA integrity
- Minimal hands-on protocol provides a high-throughput solution

Reproducibility of Cell Lysates



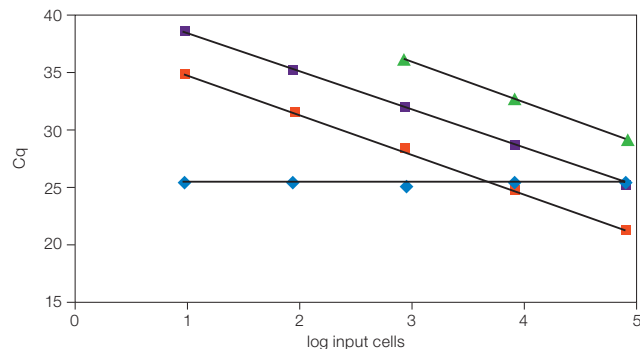
The SingleShot™ SYBR® Green Kit demonstrates high reproducibility between technical lysate replicates. Two technical lysate replicates of four neuroblastoma cell lines (SH-EP, SK-N-AS, NGP, and IMR-32) were examined using ten SYBR® Green qPCR Assays to evaluate the reproducibility of the SingleShot™ SYBR® Green Kit. A Pearson correlation of 0.99 was observed, thus demonstrating highly reproducible data between lysis reactions. Cq, quantification cycle.

Data used with permission from Gert Van Peer, Pieter Mestdagh, and Jo Vandesompele, Center for Medical Genetics, Ghent University, Ghent, Belgium.

SingleShot Cell Lysis Two-Step RT-qPCR Kits

- Kits yield high-performance RT-qPCR data directly from cell culture lysates in less than 2 hours after cell lysis
- Available with SYBR® Green or probe chemistry
- SingleShot RNA Control is included to ensure optimal input cells and lysates

PCR Efficiency across Expression Levels



SingleShot Probes Kit maintains high PCR efficiencies across all expression levels.

Accurate gene expression studies require that PCR efficiencies be within 90–110%, per the minimum information for publication of quantitative real-time PCR experiments (MIQE) guidelines. Using the SingleShot Probes Kit, three targets of varying expression levels were analyzed using input cell numbers ranging from 10 to 100,000 HeLa cells. Greater than 98% PCR efficiencies were maintained regardless of the expression levels (*TBP* ▲, 99.6%; *HPRT* ■, 98.6%; *B2M* ■, 99.2%) and sensitivity down to 10 cells was observed. The SingleShot RNA Control (◆) was used to monitor PCR inhibition. As the control quantification cycle (Cq) values remained constant, no inhibition was noted.

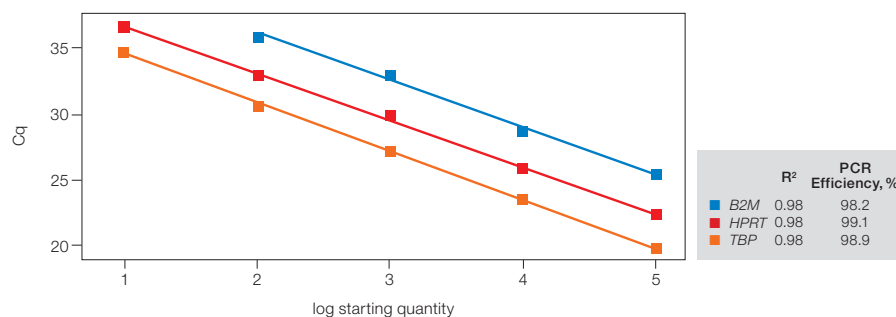
One-Step and Two-Step SYBR® Green or Probes Formats

SingleShot™ Cell Lysis One-Step RT-qPCR Kits

- Within 1.5 hr after cell lysis, yields high-performance RT-qPCR data directly from cell culture lysates
- Cell lysate up to 100,000 cells ready in 20 min
- Linear dynamic range across genes
- Available with SYBR® Green or probe chemistry
- SingleShot RNA Control is included to ensure optimal input cells and lysates



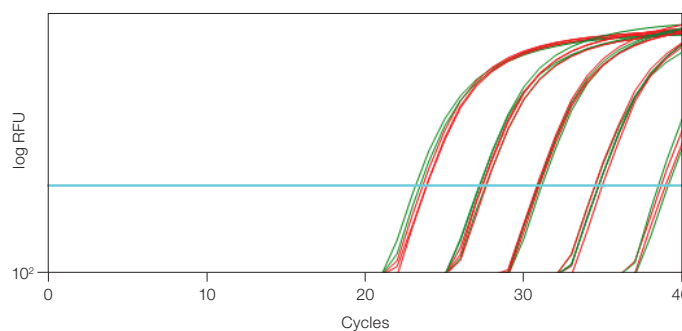
Dynamic Range across Expression Ranges



SingleShot™ SYBR® Green One-Step Kit enables a large dynamic range.

Two technical lysate replicates were examined across three differentially expressed genes (*B2M*, *HPRT*, *TBP*) using a human kidney tumor (HKT) cell line to evaluate the linear dynamic range of the SingleShot™ SYBR® Green One-Step Kit. The kit showed a large dynamic range across all assayed expression levels. Cq, quantification cycle.

Dynamic Range Similar to Purified RNA



SingleShot™ SYBR® Green One-Step Kit lysates yield a dynamic range similar to that of purified RNA. Gene expression data generated using SingleShot™ SYBR® Green One-Step Kit (■) lysates and isolated RNA (Aurum™ Total RNA Mini Kit, ■) were compared using a human cell line (K652) and from 10 to 100,000 input cells. *B2M* expression was assessed using a PrimePCR™ qPCR Assay. SingleShot™ SYBR® Green One-Step Kit lysates showed a dynamic range similar to that of the RNA generated using the Aurum Total RNA Mini Kit without the need for RNA isolation. RFU, relative fluorescence units.



Visit bio-rad.com/SingleShot or download or request bulletins 6572 and 6604 for more information.

2 RNA ISOLATION



Bio-Rad provides two distinct technologies for isolating total RNA. Silica membrane–based kits, available in 96-well plate and spin column formats, and PureZOL™ RNA Isolation Reagent, which is ideal for scaling up isolation protocols.

- Kits are designed and formulated to assist in the isolation of highly pure and intact RNA from different starting materials
- RNA is compatible with a variety of downstream applications
 - Real-time qPCR
 - Northern blotting
 - Microarray analysis
 - cDNA library construction
- DNase treatment ensures gDNA removal

RNA Isolation Kits Selection Guide

	Aurum™ Total RNA Kits			PureZOL™ RNA Isolation Reagent
	Mini	Fatty and Fibrous Tissue	96	
Description	Guanidine isothiocyanate and β -mercaptoethanol efficiently lyse samples and quickly inactivate RNases	Kit combines PureZOL, which effectively lyses tissues and cells, with the speed of silica membrane technology in a spin column format to yield high-quality, intact RNA	Kit is composed of guanidine isothiocyanate and β -mercaptoethanol for efficient lysis and quick RNase inactivation, followed by purification in a 96-well plate	PureZOL efficiently lyses cells and tissues, deproteinates RNA, and inactivates endogenous nucleases in a single step
Format	Mini column Filtration (vacuum or spin)	Mini column Filtration (vacuum or spin)	96-well plate Filtration (vacuum or spin)	Single solution organic extraction
Maximum starting material amounts				
Cultured cells	2 x 10 ⁶	1 x 10 ⁷	1 x 10 ⁶	1 x 10 ⁷
Bacterial cells	2.4 x 10 ⁹	2.4 x 10 ⁹	8 x 10 ⁸	2.4 x 10 ⁹
Yeast cells	3 x 10 ⁷	3 x 10 ⁷	2 x 10 ⁷	3 x 10 ⁷
Hard animal tissue	20 mg	100 mg	—	100 mg
Soft to moderately hard animal tissue	40 mg	100 mg	—	100 mg
Plant tissue	40 mg	100 mg	—	100 mg
Isolation method	Silica membrane	Lysis with PureZOL reagent, purification on silica membrane	Silica membrane	Organic extraction
Number of preps	50 mini preps	50 mini preps	2 x 96-well plate	50 or 100 (1 ml/prep)
Number of washes	3	3	3	—
DNase I included*	Yes	Yes	Yes	No
DNase I digest time	15 min (animal tissue, 25 min)	15 min	10 min	—
Total preparation time**	<50–80 min (with DNase I digest)	<50–80 min (with DNase I digest)	<60 min (with DNase I digest)	<60 min
Binding capacity	>100 μ g	>100 μ g	>40 μ g	—
Elution volume	2 x 40 μ l	2 x 40 μ l	80 μ l	30–100 μ l

* Removal not required.

** Total preparation time will vary depending on the tissue or cell type and which format is used (vacuum or spin).



For sample-specific yield information, visit [bio-rad.com/RNAselection](https://www.bio-rad.com/RNAselection) and click the RNA Isolation Selection Guide.

2 RNA ISOLATION

Aurum™ Sample Preparation Kits and PureZOL™ RNA Isolation Reagent

Aurum™ Sample Preparation Kits and PureZOL™ RNA Isolation Reagent

Aurum Total RNA Kits

Aurum Total RNA Kits are a family of isolation kits that provide a high yield of intact RNA from a wide range of starting materials, including cultured cells, bacteria, and yeast, as well as plant and animal tissues.

- PCR-ready RNA in less than 60 min
- RNase-free reagents and plastic consumables ensure the integrity of isolated RNA
- Kit includes DNase I provided for removal of gDNA contamination
- Easy-to-use spin or vacuum protocol

Aurum Total RNA Isolation Products come in:

- Aurum Total RNA Fatty and Fibrous Tissue Kit
- Aurum Total RNA Mini Kit
- Aurum Total RNA 96 Kit



7326830, 50 preps
Aurum Total RNA Fatty and Fibrous Tissue Kit



7326820, 50 preps
Aurum Total RNA Mini Kit



7326800, 2 x 96-well preps
Aurum Total RNA 96 Kit



7326890, 100 ml
PureZOL RNA Isolation Reagent

PureZOL RNA Isolation Reagent

- Single-solution format permits recovery of RNA from small quantities of tissues or cells, making it ideally suited for gene expression studies
- Efficient RNA purification from cultured cells, yeast, viruses, and bacteria, as well as plant and animal tissues
- PureZOL efficiently lyses cells and tissues, deproteinates RNA, and inactivates endogenous nucleases in a single step
- Scalable starting sample amount
- Convenient isolation of RNA, DNA, and protein from the same sample



For more information, download
bulletins **2919**, **2920**, and **5282**.

Ordering Information

Catalog #	Description
7326830	Aurum Total RNA Fatty and Fibrous Tissue Kit
7326870*	Aurum Total RNA Fatty and Fibrous Tissue Module
7326820	Aurum Total RNA Mini Kit
7326800	Aurum Total RNA 96 Kit
7326880	PureZOL RNA Isolation Reagent, 50 ml
7326890	PureZOL RNA Isolation Reagent, 100 ml

* Not provided with PureZOL RNA Isolation Reagent (see catalog #7326880 or #7326890 to order separately).

3 REVERSE TRANSCRIPTION

Bio-Rad's reverse transcription kits provide easy setup and high reproducibility for first-strand cDNA synthesis. Bio-Rad's reverse transcription reagents cover a range of priming strategies, including primer blends.

- Formulated for efficient reverse transcription across a broad linear dynamic range
- Potent RNase A inhibitors protect RNA during setup and reverse transcription
- Flexible input RNA capacity to suit different experimental needs
- Optimized for gene expression analysis using real-time qPCR



iScript™ Kit Selector



iScript Reverse Transcription Supermix for RT-qPCR



iScript gDNA Clear cDNA Synthesis Kit



iScript Advanced cDNA Synthesis Kit for RT-qPCR



iScript Select cDNA Synthesis Kit



iScript cDNA Synthesis Kit

Features	Minimum reaction setup time	Effective gDNA removal before reverse transcription	Maximum input RNA for high cDNA yields	Flexible priming options and high fidelity	Reliable value solution
Applications	<ul style="list-style-type: none"> Gene expression RNA quantification 	<ul style="list-style-type: none"> Gene expression RNA quantification 	<ul style="list-style-type: none"> Gene expression RNA quantification 	<ul style="list-style-type: none"> Cloning Sequencing and next-generation sequencing Gene expression RNA quantification 	<ul style="list-style-type: none"> Gene expression RNA quantification
Total Input RNA Range	1 µg–1 pg	1 µg–1 pg	7.5 µg–100 fg	1 µg–1 pg	1 µg–100 fg
Kit Format	1 tube	3 tubes	2 tubes	5 tubes	2 tubes
Kit Contents	<ul style="list-style-type: none"> 5x iScript RT Supermix No-RT control supermix 	<ul style="list-style-type: none"> 5x iScript RT Supermix No-RT control supermix DNase DNase buffer 	<ul style="list-style-type: none"> iScript Reverse Transcriptase 5x iScript Advanced Reaction Mix 	<ul style="list-style-type: none"> iScript Reverse Transcriptase 5x iScript Reaction Mix 3 priming options 	<ul style="list-style-type: none"> iScript Reverse Transcriptase 5x iScript Reaction Mix
Time to Produce cDNA	26 min	36 min	21 min	15–65 min	26 min
RNase H+ Activity	✓	✓	✓	✓	✓



Go to [bio-rad.com/PCRReagentSelector](https://www.bio-rad.com/PCRReagentSelector) and use our interactive selection tool to find the right reverse transcriptase for your needs.

3 REVERSE TRANSCRIPTION

cDNA Synthesis Reagents

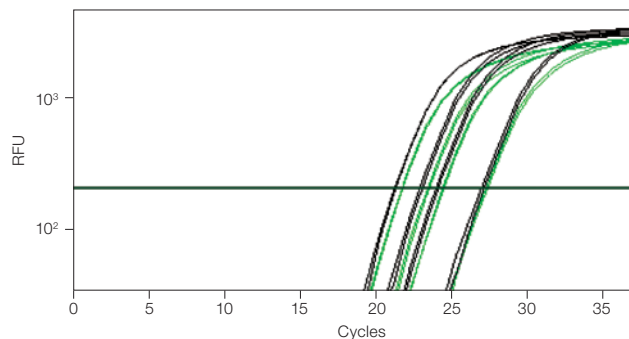
cDNA Synthesis Reagents

iScript™ Performance

iScript Reverse Transcription Kits were designed for easy setup, high reproducibility, and bias-free cDNA synthesis. iScript reagent features include:

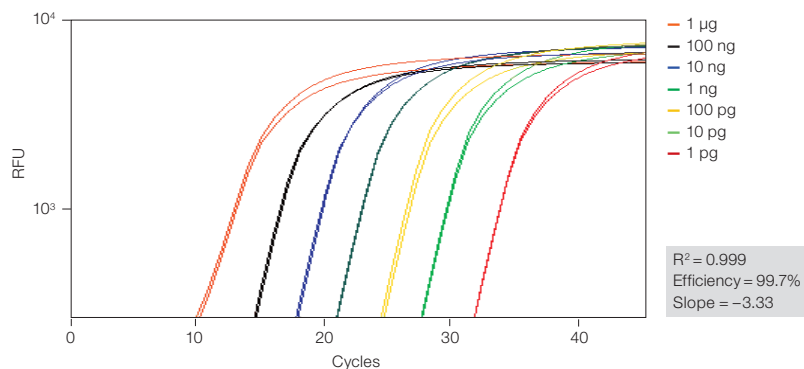
- RNase H⁺ activity of the reverse transcriptase ensures 1:1 RNA:cDNA conversion, resulting in greater sensitivity and more accurate data
- Optimal blend of oligo(dT) and random primers for complete and unbiased coverage
- Potent blend of RNase inhibitors prevents RNA degradation during reaction setup and cDNA synthesis steps

Superior 5' to 3' Coverage



Total RNA (7.5, 2, 1, and 0.1 µg) from HeLa cells was reverse transcribed using the iScript Advanced cDNA Synthesis Kit for RT-qPCR in a 20 µl reaction. One-tenth of the generated cDNA was used as template to amplify the *APC* gene in a 10 µl qPCR reaction with iTaq™ Universal SYBR® Green Supermix on a CFX384™ Real-Time PCR Detection System. Primer pairs were designed at the 5' end (■, 91 bp amplicon) and 3' end (■, 69 bp amplicon). There was no significant difference between the two primer pairs. This demonstrates superior coverage of the 5' and 3' regions of target mRNA. RFU, relative fluorescence units.

Broad Dynamic Range



iScript Reverse Transcription Supermix for RT-qPCR efficiently reverse transcribes RNA over a broad linear dynamic range for reliable gene expression analysis data. Different amounts of HeLa cell RNA (amounts shown in inset) were reverse transcribed and one-tenth of the resulting cDNA was used as a template to amplify β -actin gene (~90 bp) in 20 µl qPCR reactions with iTaq™ Universal SYBR® Green Supermix. RFU, relative fluorescence units.



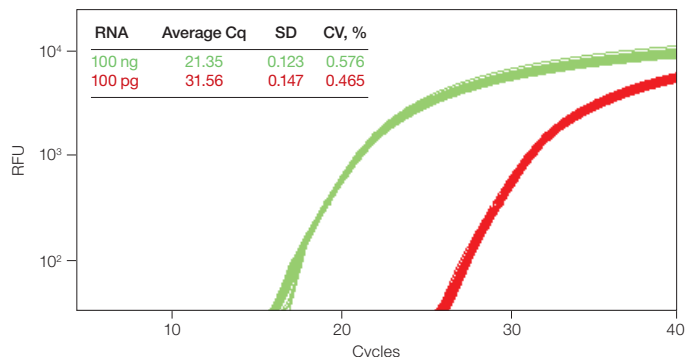
For more information, download bulletins **6031**, **6125**, and **6742**.

Watch the tutorial!
Understanding Reverse Transcription
bio-rad.com/RT-tutorial



cDNA Synthesis Reagents

iScript™ Reproducibility

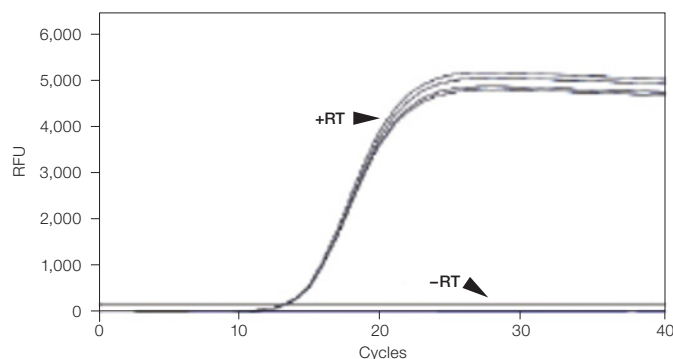


Excellent data reproducibility. *PGK-1* mRNA (~160 bp), a gene that encodes a glycolytic enzyme, was quantified using iScript Reverse Transcription Supermix for RT-qPCR, both with 100 ng (■) and 100 pg (■) of input RNA. For each input RNA, 48 individual RT reactions were performed and one-tenth of the resulting cDNA was used in the qPCR reaction with SsoFast™ Probes Supermix. The gene expression analysis data show excellent reproducibility, with both high and low levels of input target mRNA. The ~10 quantification cycle (Cq) difference for the 1,000-fold dilution of RNA (100 ng–100 pg) demonstrates good reverse transcription efficiencies across different input RNAs. CV, coefficient of variation; RFU, relative fluorescence units; SD, standard deviation.

Ordering Information

Catalog #	Description
cDNA Synthesis Reagents	
1725037	iScript Advanced cDNA Synthesis Kit for RT-qPCR, 25 x 20 µl reactions
1725038	iScript Advanced cDNA Synthesis Kit for RT-qPCR, 100 x 20 µl reactions
1725038BUN	iScript Advanced cDNA Synthesis Kit for RT-qPCR, 500 x 20 µl reactions
1708890	iScript cDNA Synthesis Kit, 25 x 20 µl reactions
1708891	iScript cDNA Synthesis Kit, 100 x 20 µl reactions
1725034	iScript gDNA Clear cDNA Synthesis Kit, 25 x 20 µl reactions
1725035	iScript gDNA Clear cDNA Synthesis Kit, 100 x 20 µl reactions
1725035BUN	iScript gDNA Clear cDNA Synthesis Kit, 500 x 20 µl reactions

Effective Removal of Genomic DNA



iScript gDNA Clear cDNA Synthesis Kit eliminates contaminating genomic DNA.

HeLa RNA (1 µg) was spiked in with 300 ng gDNA. Contaminating gDNA was cleared and cDNA synthesis was then performed with (+RT) and without (–RT) reverse transcriptase using iScript gDNA Clear cDNA Synthesis Kit. qPCR was performed using the human *TUBA* assay, an exonic assay that detects both mRNA and gDNA. Complete removal of gDNA is demonstrated by the absence of amplification in the –RT sample. RFU, relative fluorescence units.

Catalog #	Description
1708840	iScript Reverse Transcription Supermix for RT-qPCR, 25 x 20 µl reactions
1708841	iScript Reverse Transcription Supermix for RT-qPCR, 100 x 20 µl reactions
1708841BUN	iScript Reverse Transcription Supermix for RT-qPCR, 500 x 20 µl reactions
1708896	iScript Select cDNA Synthesis Kit, 25 x 20 µl reactions
1708897	iScript Select cDNA Synthesis Kit, 100 x 20 µl reactions

4 PCR AND REAL-TIME PCR REAGENTS



Bio-Rad's PCR and real-time PCR reagents and kits feature advanced enzyme technology and buffer formulation for robust amplification and detection with maximum sensitivity, specificity, and efficiency.

- Patented Sso7d fusion enzyme technology delivers higher processivity and inhibitor tolerance
- High performance obtained on any instrument, under any condition
- Antibody-mediated hot-start technology enables instant polymerase activation and superior specificity
- Time to results decreased without compromising qPCR data quality

Real-Time PCR Reagents Selection Guide

Use this selection guide to choose an appropriate reagent for your application.

	qPCR (DNA to Cq)			One-Step RT-qPCR (RNA to Cq)
	SsoAdvanced™ Universal Supermixes	SsoAdvanced Universal Inhibitor-Tolerant Supermix	iTaq™ Universal Supermixes	iTaq Universal One-Step Kits
Features	Sso7d-driven robust performance with demanding templates and under challenging conditions	Sso7d-driven optimal performance for samples containing PCR inhibitors	Advanced formulation for reliable, reproducible performance	Fast and convenient solution for sensitive one-step RT-qPCR from RNA or cell lysate
Sensitive detection of low-abundance targets	••••	••••	••••	••••
Efficient amplification of difficult targets	••••	••••	••	••
Specific amplification of targets	••••	••••	••••	••••
Robust performance under varying PCR conditions*	••••	••••	••	••
Tolerance to PCR inhibitors	••••	••••	••	••
Fast cycling compatibility	Yes	Yes	Yes	Yes
Available detection chemistry	SYBR® Green and probes	SYBR® Green	SYBR® Green and probes	SYBR® Green and probes
Compatibility with any qPCR instrument	Any instrument	Any instrument	Any instrument	Any instrument
Samples	<ul style="list-style-type: none"> Blood spot Cell lysate Crude extraction FFPE LCM Plant extract Plant tissue Plasmid Purified gDNA and cDNA 	<ul style="list-style-type: none"> Blood spot Cell lysate Crude extraction FFPE LCM Plant extract Plant tissue Plasmid Purified gDNA and cDNA 	<ul style="list-style-type: none"> Plasmid Purified gDNA and cDNA 	<ul style="list-style-type: none"> Cell lysate Purified RNA

••• Fair •••• Good ••••• Excellent

cDNA, complementary DNA; Cq, quantification cycle; FFPE, formalin-fixed, paraffin-embedded; gDNA, genomic DNA; LCM, laser capture microdissection; RT-qPCR, reverse transcription quantitative PCR.

* Primer concentrations, annealing temperatures, salt concentrations, and/or cycling protocol (standard or fast).



View the Universal Real-Time PCR Reagents App for more information.



Go to bio-rad.com/PCRReagentSelector and use our interactive selection tool to find the right product for your needs.

4 PCR AND REAL-TIME PCR REAGENTS

SsoAdvanced™ Universal Supermixes

SsoAdvanced™ Universal Supermixes

Innovative Sso7d Fusion Enzyme Technology for Robust qPCR

SsoAdvanced Universal Supermixes are exclusive high-performance real-time PCR reagents based on Bio-Rad's patented* Sso7d fusion protein polymerase technology and advanced buffer formulation.

The supermixes are uniquely formulated to provide higher processivity, increased PCR inhibitor tolerance, and robust performance with challenging templates and targets in SYBR® Green– or probe-based qPCR. They deliver superior performance for a wide range of applications on any qPCR platform and are validated to ensure optimal results with Bio-Rad's PrimePCR™ Gene Expression Assays.

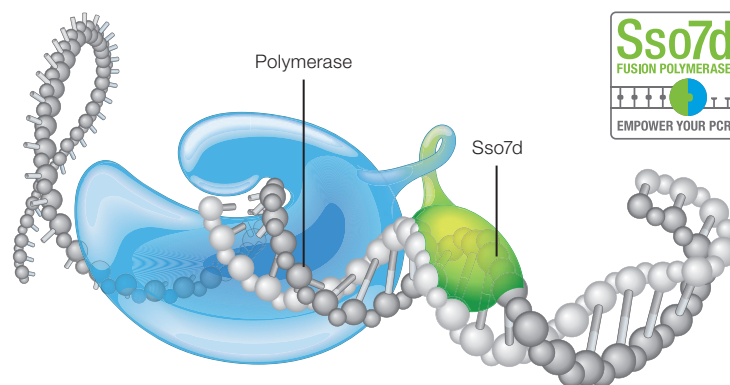
SsoAdvanced Universal Supermixes allow you to:

- **Achieve superior real-time PCR results under various experimental conditions** — our robust formulation delivers consistent performance in fast and standard cycling across a broad range of reaction conditions, primer concentrations, and temperature ranges
- **Increase qPCR sensitivity and efficiency of detection from compromised samples** — the highly processive Sso7d fusion polymerase exhibits increased resistance to a wide variety of PCR inhibitors, enhancing sensitivity and overall performance
- **Shorten time to results while maintaining qPCR data quality** — the Sso7d fusion polymerase and optimized buffer provide rapid polymerization kinetics and instant polymerase activation
- **Carry out high-performance singleplex and duplex reactions** — the Sso7d fusion polymerase and advanced formulation enable robust performance in singleplex or duplex real-time PCR reactions, providing the highest data precision and allowing cost and time savings

- **Use any real-time PCR system** — the universal reference dye in these supermixes enables ROX normalization of qPCR data regardless of the ROX requirements of the qPCR system

SsoAdvanced Universal Supermixes include:

- SsoAdvanced™ Universal SYBR® Green Supermix
- SsoAdvanced Universal Probes Supermix
- SsoAdvanced™ Universal Inhibitor-Tolerant SYBR® Green Supermix



The dsDNA binding protein, Sso7d, stabilizes the polymerase-template complex, increases processivity, and provides greater speed and reduced reaction times compared to conventional DNA polymerases. Sso7d fusion polymerases are significantly more resistant to PCR inhibitors, making the SsoAdvanced Supermixes ideal choices for challenging applications, such as direct qPCR, without the need for sample preparation.

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.

Watch the tutorial! Understanding Real-Time PCR Supermixes
bio-rad.com/RTsmxTutorial



Visit bio-rad.com/Supermixes or download or request bulletin 6773 for more information.

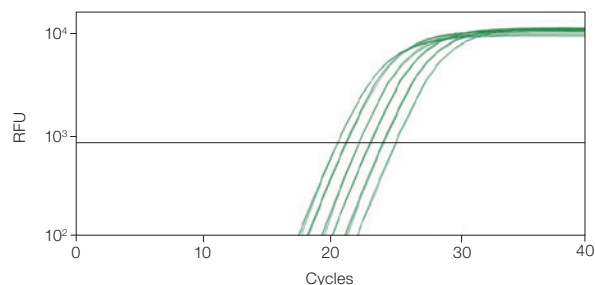
SsoAdvanced™ Universal Supermixes

SsoAdvanced™ Universal SYBR® Green and Probes Supermixes

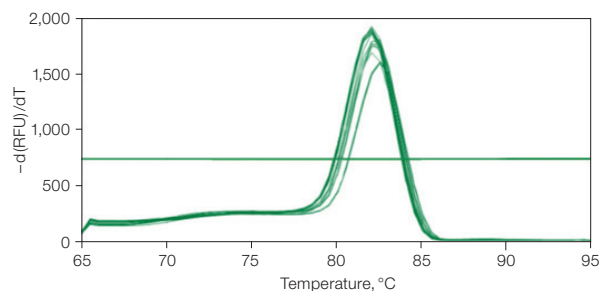
SsoAdvanced Universal Supermixes employing our patented* Sso7d fusion enzyme technology provide higher processivity, increased PCR inhibitor tolerance, and robust performance with challenging templates and target sequences in real-time PCR.

SYBR SsoAdvanced™ Universal SYBR® Green Supermix

A. Optimal PCR Sensitivity



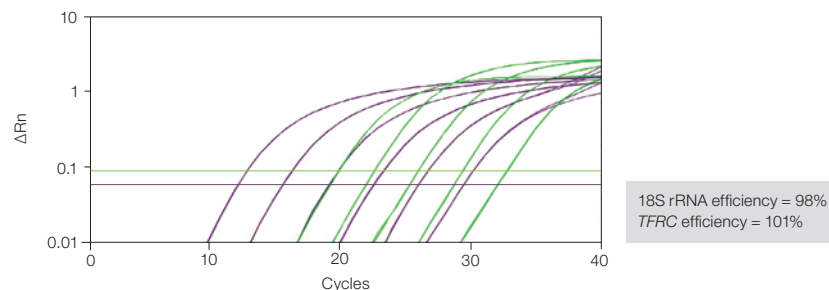
B. Superior PCR Specificity



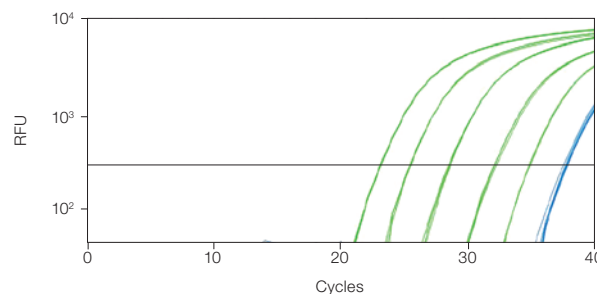
Optimal PCR sensitivity and specificity with SsoAdvanced™ Universal SYBR® Green Supermix. **A**, a PrimePCR™ Assay targeting β_2 microglobulin, using 250, 125, 62.5, 31.25, 15.625, and 7.8125 cells/20 μ l reaction, was performed on a CFX96™ Real-Time PCR Detection System and yielded optimal PCR sensitivity; **B**, melt curve analysis displays enhanced PCR. RFU, relative fluorescence units.

Probe SsoAdvanced Universal Probes Supermix

A. Superior Multiplex qPCR Performance



B. Single-Copy Detection



Superior qPCR performance in a duplex reaction (A) and single-copy detection (B) with SsoAdvanced Universal Probes Supermix. **A**, predesigned TaqMan Gene Expression Assays in a duplex reaction with 10 ng–100 fg cDNA using an 18S rRNA assay (■) and 100 ng–10 pg cDNA using a *TFRC* assay (■) were performed on an Applied Biosystems Viia 7 System; **B**, a gDNA assay targeting *IL-1 β* , with gDNA serially diluted to a calculated single copy (■), was performed on a CFX96 Real-Time PCR Detection System. RFU, relative fluorescence units; ΔRn , baseline-corrected normalized reporter.

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.

4 PCR AND REAL-TIME PCR REAGENTS

SsoAdvanced™ Universal Supermixes

SsoAdvanced™ Universal Supermixes



SsoAdvanced™ Universal Inhibitor-Tolerant SYBR® Green Supermix

SsoAdvanced™ Universal Inhibitor-Tolerant SYBR® Green Supermix is a high-performance real-time PCR supermix specifically formulated for use with difficult target sequences in a wide range of challenging samples, including crude lysates.

- **Power through PCR inhibitors** — delivers unrivaled performance with common PCR inhibitors, such as heparin, polysaccharides, culture media, and more
- **Skip RNA and DNA extraction by using crude samples** — lysates from plants, seeds, cells, bacteria, or FFPE samples
- **Increase cDNA loading** — add up to 20% cDNA from our iScript™ Advanced cDNA Synthesis Kit for RT-qPCR or iScript Reverse Transcription Supermix for RT-qPCR

Applications and Uses

- Environmental monitoring
- Gene expression
- Genetically modified organism (GMO) testing
- Mutation detection
- Pathway analysis
- Single nucleotide polymorphism (SNP) genotyping
- Viral and bacterial detection

Sample	Assay	SsoAdvanced™ Universal Inhibitor- Tolerant SYBR® Green Supermix	Quanta Bioscience's PerfeCTa® SYBR® Green FastMix	Clontech's Terra™ qPCR Direct SYBR® Premix
		Challenging Target Assay (hsGAPDH [226 bp]; 5 ng hgDNA)		
Bile salts	Cholic acid	0.5 µg/µl	0.25 µg/µl	0.5 µg/µl
	Deoxycholic acid	0.25 µg/µl	0.125 µg/µl	0.25 µg/µl
Polysaccharides	Polygalacturonic acid	0.625 µg/µl	0.1563 µg/µl	0.3125 µg/µl
Lipids	Cholesterol hydrochloride	0.125 µg/µl	0.0625 µg/µl	0.01563 µg/µl
Algae	Alginate acid	0.25 µg/µl	0.125 µg/µl	0.25 µg/µl
Clay	Montmorillonite	20 ng/µl	20 ng/µl	20 ng/µl
Blood	Heparin	5 ng/µl	0 ng/µl	2.5 ng/µl
	Hematin	1.5625 µM	0.7813 µM	0.7813 µM
	EDTA	0.7813 mM	0.7813 mM	0.3907 mM
	Serum	0.63%	—	—
Soil	Humic acid	0.625 ng/µl	0.1563 ng/µl	0.3125 ng/µl
Textile	Indigo	5 mM	5 mM	2.5 mM
Wine	Tannic acid	0.6250 ng/µl	0.3125 ng/µl	0.3125 ng/µl
Plants	Cellulose	2%	1%	1%
	Pectin (for fiber control)	0.125 µg/µl	0.125 µg/µl	0.25 µg/µl
Hair, tissues	Melanin	20 ng/µl	10 ng/µl	10 ng/µl
Bones, teeth	CaCl ₂	1.25 mM	0.3125 mM	0.6250 mM

Sample	Assay	SsoAdvanced™ Universal Inhibitor- Tolerant SYBR® Green Supermix	Quanta Bioscience's PerfeCTa® SYBR® Green FastMix	Clontech's Terra™ qPCR Direct SYBR® Premix
		Challenging Target Assay (hsGAPDH [226 bp]; 5 ng hgDNA)		
Cell lysates	MEM+FBS	5%	5%	5%
	PBS	10%	10%	5%
	Trypsin	0.000094%	0.000094%	0.00%
Sample preparation	NaAc	25 mM	25 mM	12.5 mM
	NaCl	12.5 mM	6.25 mM	6.25 mM
	EtOH	2.50%	1.25%	1.25%
	Isopropanol	2.50%	1.25%	1.25%
	TRIzol	0.30%	0.30%	0.15%
	InstaGene™ Matrix	0.30%	0.15%	0.02%
Miscellaneous	Green tea	0.50%	—	—
	Chocolate	0.13%	—	—
	Dust	0.18 µg/µl	—	—
	SDS	0.003%	0.003%	0.006%
	DMSO	3%	1.50%	1.50%
	DTT	2 mM	2 mM	No amplification
Body fluids	Spermidine	1.25 mM	1.25 mM	1.25 mM
	Urea	80 mM	80 mM	80 mM

PCR inhibitor tolerance testing with SsoAdvanced™ Universal Inhibitor-Tolerant SYBR® Green Supermix against Quanta's PerfeCTa® SYBR® Green FastMix and Clontech's Terra™ qPCR Direct SYBR® Premix. Each qPCR reaction was performed using a challenging long (226 bp) human gDNA assay targeting *GAPDH* and 5 ng of human gDNA. The values represent the maximum percentage and concentration for which a ≤1 quantification cycle (Cq) delay was noted. Any delay >1 Cq was deemed unacceptable for inhibitor tolerance. —, not tested.

4 PCR AND REAL-TIME PCR REAGENTS

iTaq™ Universal Supermixes

iTaq™ Universal Supermixes

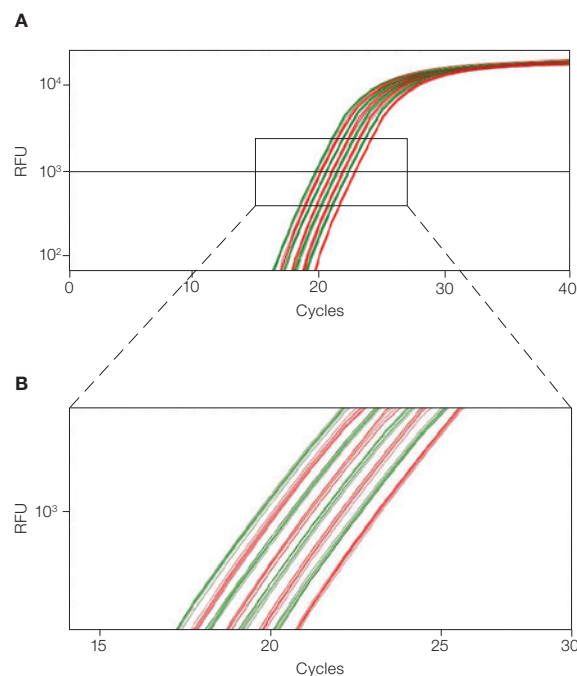
iTaq Universal Supermixes are ready-to-use, 2x reaction master mixes for SYBR® Green– or probe-based qPCR. These supermixes contain an advanced buffer formulation for optimal qPCR performance.

- Quickly start your experiment within 30 sec with antibody-mediated hot-start iTaq DNA Polymerase for rapid activation
- Obtain reliable and reproducible gene expression analysis results
- Achieve consistent results across real-time instrument platforms under fast or standard conditions
- Utilize any real-time PCR system, with its blend of passive reference dyes
- Employ PrimePCR™ Assays and Panels — validated for use with iTaq Universal Supermixes

SYBR iTaq™ Universal SYBR® Green Supermix

- Contains an advanced buffer formulation with SYBR® Green I for optimal qPCR performance
- Provides a way to amplify gDNA and difficult amplicons with superior efficiency
- Applications and uses include gene expression analysis, genotyping, detection, and pathogen detection

Matchless Precision and Accuracy



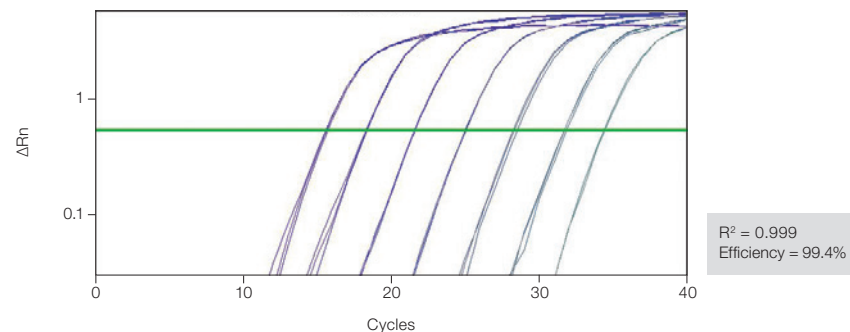
Superior accuracy and precision with iTaq™ Universal SYBR® Green Supermix ensures production of high-quality data. An *ACTB* cDNA assay was performed on a CFX96™ Real-Time PCR Detection System using iTaq™ Universal SYBR® Green Supermix, which produced 1.33-fold discrimination. RFU, relative fluorescence units.

iTaQ™ Universal Supermixes

Probe iTaq Universal Probes Supermix

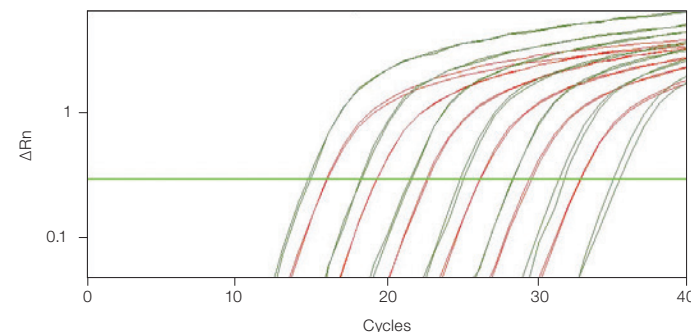
- **Carry out high-performance singleplex and duplex reactions** — robust performance in singleplex or duplex real-time PCR reactions enables increased data precision and saves samples, reagents, and time
- **Achieve superior results under various conditions** — broad range of cycling conditions, primer concentrations, temperature ranges, sample types, and target sequences can be applied
- **Decrease run times and time to results without compromising qPCR data quality** — provides rapid polymerization kinetics and instant polymerase activation for run times less than 40 minutes

Maximum Dynamic Range for Complete Gene Expression Detection



Dynamic range of iTaq Universal Probes Supermix. An *ACTB* cDNA assay was performed on an Applied Biosystems 7900 System and produced standard curve $R^2 = 0.999$ and efficiency = 99.4% with a 6-log dynamic range. ΔR_n , baseline-corrected normalized reporter.

Advantageous Sensitivity Compared to TaqMan Master Mix



Comparison of dynamic range using iTaq Universal Probes Supermix vs. TaqMan Fast Universal PCR Master Mix (Thermo Fisher Scientific). An *ACTB* cDNA assay was performed on an Applied Biosystems 7900 System. iTaq Universal Probes Supermix (■) demonstrates a 6-log dynamic range with earlier Cq values and greater sensitivity compared to TaqMan Fast Universal PCR Master Mix (■), which demonstrates a 5-log dynamic range and delayed Cq values. ΔR_n , baseline-corrected normalized reporter.

4 PCR AND REAL-TIME PCR REAGENTS

iTaq™ Universal One-Step Kits

iTaq™ Universal One-Step Kits

iTaq Universal One-Step Kits are a fast and convenient solution for real-time RT-qPCR, using the powerful combination of iScript™ RNase H+ Moloney Murine Leukemia Virus (MMLV) Reverse Transcriptase and hot-start iTaq DNA Polymerase in one reaction. Select from SYBR® Green– or probe-based assays for flexibility.

- **Achieve superior gene expression results under various cycling conditions** — our robust formulation delivers consistent performance in standard or fast cycling conditions, primer concentrations, sample and target types, and temperature ranges, allowing cost and time savings
- **Improve PCR efficiency and obtain wider dynamic range, superior sensitivity and specificity, and inhibitor tolerance** — even with cell lysates — without affecting performance
- **Use any ROX dependent or independent real-time PCR system** — the universal reference dye in these supermixes enables ROX normalization of qPCR data regardless of the ROX requirements of the qPCR system
- **Minimize handling and contamination risk** — perform cDNA synthesis and qPCR in 1 tube

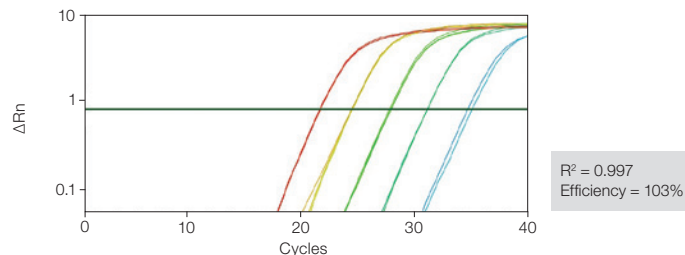
SYBR iTaq™ Universal SYBR® Green One-Step Kit

- **Benefit from enhanced efficiency, specificity, and sensitivity** — our patented* inhibitor reducer prevents the interference of the RT enzyme with the DNA polymerase during the replication of cDNA
- **Obtain better results with qPCR assays** — simplify your workflow and experimental design using our wet-lab validated PrimePCR™ Assays; each assay for the human, mouse, and rat genomes was experimentally tested for optimal efficiency, specificity, sensitivity, and linear dynamic range

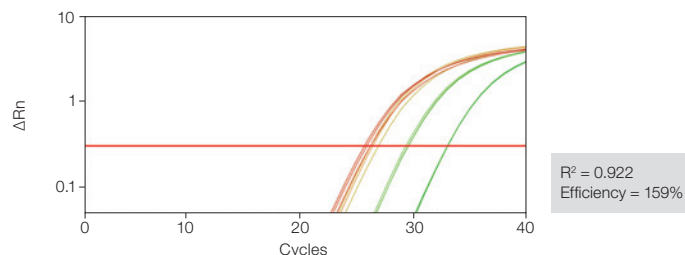
* U. S. patent 8,338,094.

Superior Dynamic Range and Sensitivity

A. Bio-Rad



B. Thermo Fisher Scientific



Superior dynamic range and sensitivity with iTaq™ Universal SYBR® Green One-Step Kit. A 120 bp human *FAS* assay with an input of 500 ng–50 pg total RNA was performed on a ViiA 7 Real-Time PCR System (Thermo Fisher Scientific). **A**, iTaq™ Universal SYBR® Green One-Step Kit; **B**, *Power SYBR® Green RNA-to-C_T 1-Step Kit* (Thermo Fisher Scientific). Note the delayed threshold cycle (C_T) values, loss of dynamic range, and compression of input 500 ng total RNA using the *Power SYBR® Green RNA-to-C_T 1-Step Kit*. This demonstrates RT-qPCR inhibition with higher input RNA and lack of low-level target expression detection. ΔR_n , baseline-corrected normalized reporter.

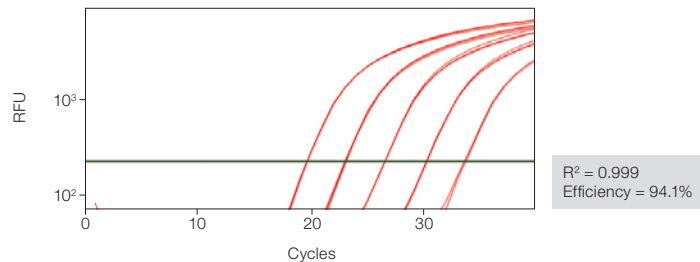
iTaQ™ Universal One-Step Kits

Probe iTaQ Universal Probes One-Step Kit

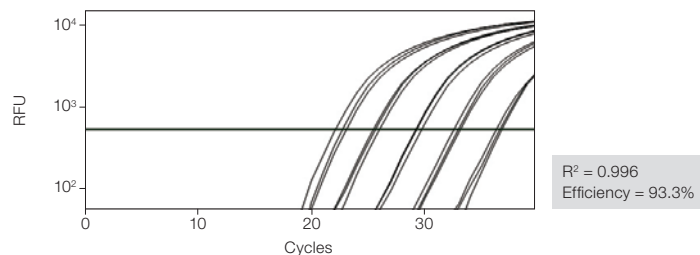
- **Obtain superior results with singleplex and multiplex reactions** — advanced formulation enables the simultaneous amplification of up to 3 targets, resulting in higher data precision with fewer pipetting steps and reduced sample usage
- **High-throughput real-time PCR screening and validation** — simplified workflow and reduced cycling times enable screening and validation of the greatest number of samples and targets in the shortest period of time

Optimal RT-qPCR Efficiency and Sensitivity with an AT-Rich and Long Amplicon

A. Bio-Rad



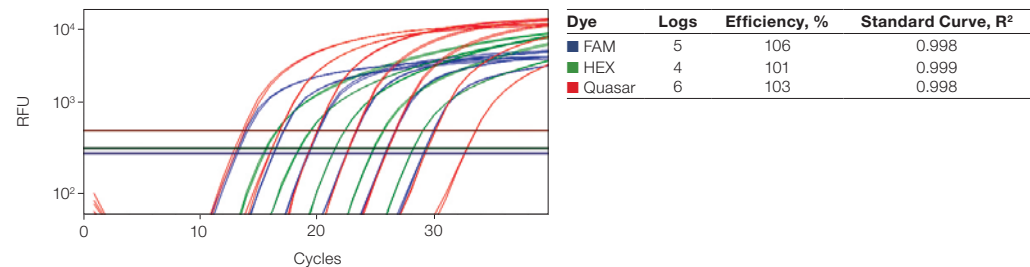
B. Thermo Fisher Scientific



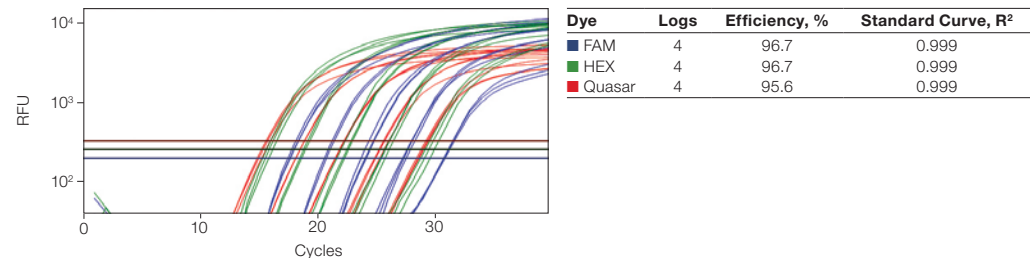
Optimal RT-qPCR efficiency and sensitivity with iTaq Universal Probes One-Step Kit. A 61% AT-rich, long, 248 bp *HPRT* assay with an input of 100 ng–10 pg RNA was performed on a CFX96™ Real-Time PCR Detection System. **A**, iTaq Universal Probes One-Step Kit; **B**, TaqMan RNA-to-C_t 1-Step Kit (Thermo Fisher Scientific) produced delayed C_q values with less than optimal data precision for the technical replicates. RFU, relative fluorescence units.

Superior RT-qPCR Performance in a Triplex Reaction

A. Bio-Rad



B. Thermo Fisher Scientific



Superior RT-qPCR performance in a triplex reaction with iTaq Universal Probes One-Step Kit. An *XPO* (FAM), *TUB* (HEX), and *GAPDH* (Quasar) assay set with an input of 100 ng–100 fg RNA was performed on a CFX96 Real-Time PCR Detection System. **A**, iTaq Universal Probes One-Step Kit exhibited the greatest dynamic range across all three assays, which indicates a high degree of sensitivity. In addition, the iTaq Kit demonstrated the lowest standard deviations for technical replicates. **B**, TaqMan RNA-to-C_t 1-Step Kit from Thermo Fisher Scientific did not perform as well, exhibiting 4 logs of dynamic range for each assay (lower sensitivity) and higher standard deviations for technical replicates (lower data precision). RFU, relative fluorescence units.

4 PCR AND REAL-TIME PCR REAGENTS

iQ™ Supermixes

iQ™ Supermixes

iQ Supermixes contain hot-start iTaq™ DNA Polymerase, deoxynucleoside triphosphates (dNTPs) qualified for qPCR, and buffer at concentrations optimal for real-time PCR assays. These supermixes can be used across a wide dynamic range of human genomic and plasmid DNA concentrations.

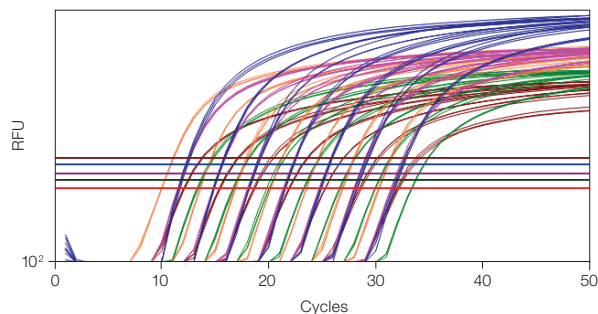
Probe iQ Multiplex Powermix

- Robust supermix formulated for sensitive and efficient multiplex qPCR
- Reliable quantification of up to 4 targets (expression levels can vary up to 10⁶-fold between target genes) or up to 5 targets
- Linearity over 6 orders of magnitude of input cDNA and 4 orders of magnitude of input genomic DNA
- Suitable for a wide variety of applications, including gene expression analysis, SNP genotyping, SNP analysis, GMO detection, and viral load detection

SYBR iQ™ SYBR® Green Supermix

- Analysis of low-, medium-, and high-abundance target genes with superior sensitivity and efficiency
- Formulated for maximum SYBR® Green I stability and performance in a wide variety of real-time PCR instruments

Accurate and Precise 5-Plex qPCR Results



Dye	Efficiency, %	Standard Curve, R ²
FAM	97.8	1.000
HEX	98.9	1.000
Texas Red	99.7	1.000
Cy5	98.1	1.000
Quasar	99.8	1.000

iQ Multiplex Powermix produces highly accurate and precise 5-plex qPCR results in a single well reaction across 6 logs of dynamic range. RFU, relative fluorescence units.



For more information, download bulletins [2764](#) and [5348](#).

Precision Melt Supermix

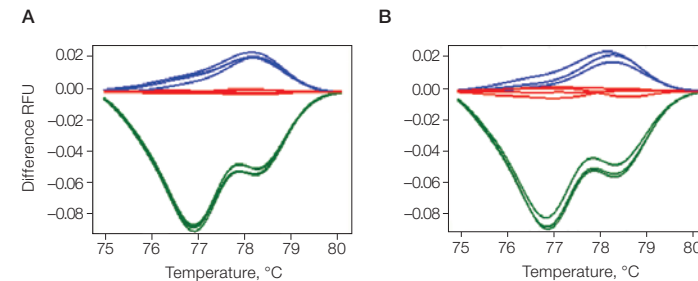
Precision Melt Supermix is a superior high resolution melt (HRM) supermix that delivers optimal discrimination for numerous applications.

- Sensitive and specific discrimination of class I–IV SNPs across a broad range of amplicons
- Ideal solution for insertions or deletions >6 base pairs
- Accurate detection of the percentage of CpG methylation status for epigenetic studies
- Ideal for mutation screening of small mutations or using a primer walking approach for larger regions
- Cost-saving application for upstream and downstream next-generation sequencing (NGS) prescreens and postvalidations
- Exceptional room temperature stability for high-throughput HRM studies
- Optimized formulation containing EvaGreen® Dye delivers robust PCR and HRM performance

Applications and Uses

- Genotyping
- Methylation studies
- Mutation detection
- NGS screening
- Species identification

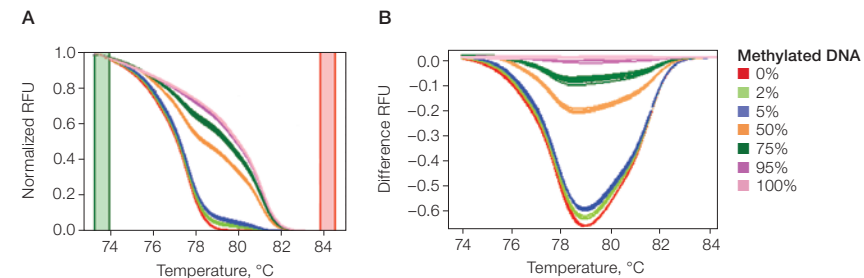
Exceptional Stability



Exceptional stability enables high-throughput genotyping analysis with Precision Melt Supermix.

Specific amplification and accurate discrimination of a class IV SNP (84 bp amplicon) from mouse gDNA was performed on a CFX384™ Real-Time PCR Detection System either 0 hr (A) or 48 hr (B) after reaction setup. Wild type (■), heterozygote (■), and homozygous mutant (■) are shown in the difference plots normalized to wild-type samples. Total run time including melt curve = 150 min. RFU, relative fluorescence units.

Accurate Methylation Detection



Accurate methylation detection with Precision Melt Supermix. A, normalized melt curve; B, difference curve. Mixtures of methylated and unmethylated human gDNA of varying ratios were analyzed using HRM analysis on a CFX384 Real-Time PCR Detection System. Increasing amounts of methylated DNA were analyzed for methylation of the human *RARB2* gene. The genomic region contains seven CpG sites and is 88 bp in length. Total run time including melt curve = 190 min. RFU, relative fluorescence units.



For more information,
download bulletin **6137**.

4 PCR AND REAL-TIME PCR REAGENTS

Precision Blue™ Real-Time PCR Dye

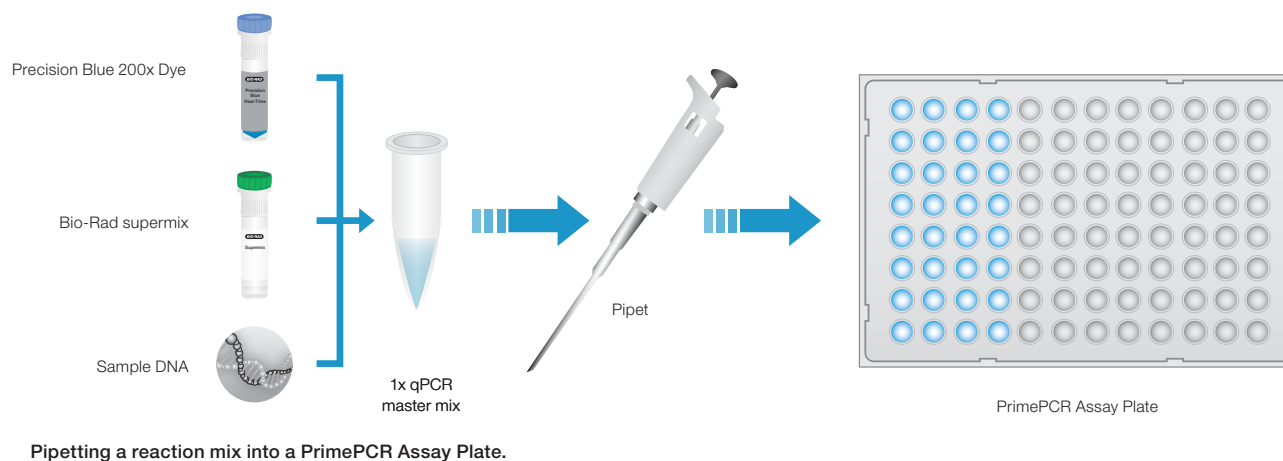
Precision Blue™ Real-Time PCR Dye

Precision Blue Real-Time PCR Dye is a concentrated, ready-to-use reagent that enhances the visibility of real-time PCR reactions. This robust, versatile reagent is formulated for a wide range of real-time PCR applications.

- Facilitates precise pipetting and accurate reaction tracking when loading tubes or plates
- Helps increase qPCR accuracy and reproducibility
- Decreases setup time without compromising qPCR data quality
- Useful for loading white or 384-well plates

Precision Blue Dye performs well and is compatible with:

- All PrimePCR™ Assays and Arrays
- Bio-Rad's universal real-time supermixes and one-step kits
- Fluorogenic probes and SYBR® Green chemistries



High-Fidelity and Standard PCR Reagents

Bio-Rad offers reagents for both high-fidelity and standard PCR applications. Use the selection guide to choose an appropriate DNA polymerase for your application.

High-Fidelity and Standard PCR Reagents Selection Guide

Features	iProof™ High-Fidelity DNA Polymerase	iTaq™ DNA Polymerase
Sso7d fusion enzyme technology	Yes	No
Hot-start enzyme activation	No	Yes, antibody-mediated
5'→3' exonuclease	No	Yes
3'→5' exonuclease	Yes	No
Blunt or 3'-A ends	Blunt	3'-A
Fidelity (vs. Taq)	52x	—
Long amplification	Yes, up to 37 kb	—
Fast cycling	Yes	No

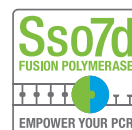
iTaq DNA Polymerase

- Antibody-mediated hot-start DNA polymerase for quick 3 min activation at 95°C
- Polymerase prevents nonspecific amplification and primer-dimers in both PCR and real-time PCR applications

iProof High-Fidelity DNA Polymerase

iProof High-Fidelity DNA Polymerase is composed of a unique *Pyrococcus*-like proofreading enzyme, which employs our patented* Sso7d fusion enzyme technology for speed and accuracy. It is an ideal choice for applications that require high fidelity, such as cloning. iProof DNA Polymerase features:

- **High fidelity** — iProof DNA Polymerase is 52-fold more accurate than Taq DNA polymerase
- **Speed** — high processivity dramatically reduces extension time (15–30 sec/kb) and overall reaction times
- **Successful amplification of long products with higher yields** — fragments up to 37 kb are amplified in less time and with less enzyme (0.25–1 U/reaction)



iProof DNA Polymerase is available in three convenient formats:

- Convenient, ready-to-use 2x master mix
- DNA polymerase kit, including reaction buffers
- PCR kit, including reaction buffers and controls

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.



For more information, download bulletins **2779** and **5211**.

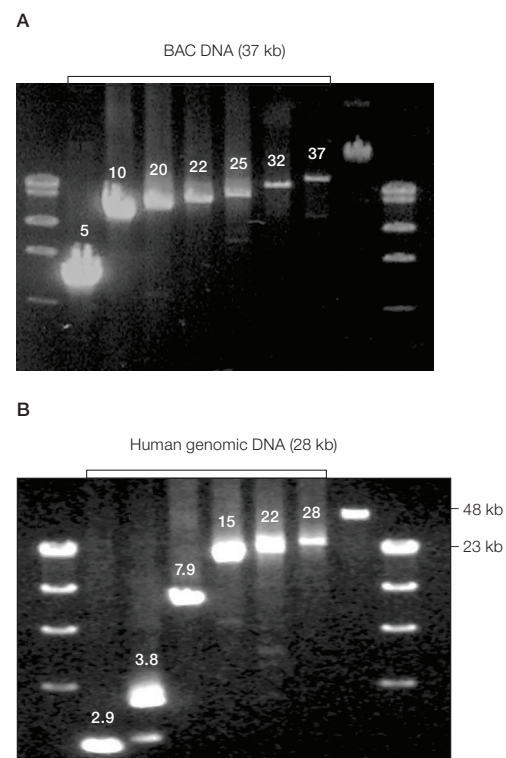
4 PCR AND REAL-TIME PCR REAGENTS

High-Fidelity and Standard PCR Reagents

High-Fidelity and Standard PCR Reagents

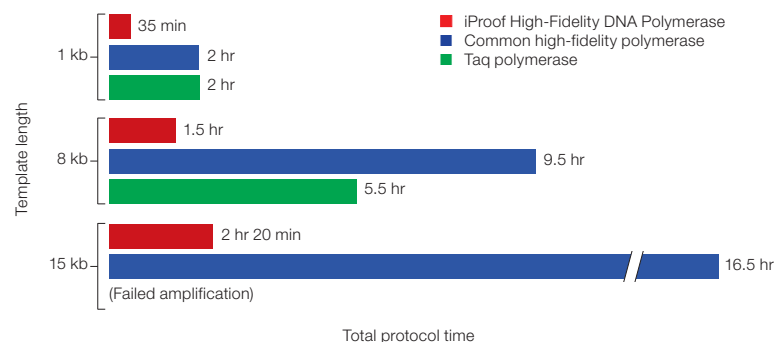
iProof™ High-Fidelity DNA Polymerase Performance

Amplification of Long Templates



iProof High-Fidelity DNA Polymerase amplifies long templates with high yields. **A**, various fragments up to 37 kb in length were amplified from BAC DNA using a combined annealing/extension step of 10 min per cycle and 30 U/ml of iProof Polymerase. **B**, various sequences up to 28.8 kb were amplified directly from human genomic DNA using 30 U/ml of iProof Polymerase in GC buffer with a combined annealing/extension time of 10 min per cycle. BAC, bacterial artificial chromosome.

Shorter Overall Reaction Times



iProof High-Fidelity DNA Polymerase demonstrates unrivaled speed, leading to dramatically shorter overall reaction times. The reaction protocol for iProof Polymerase was compared to the recommended protocols for two competing polymerases. Each protocol was designed to amplify 1, 8, and 15 kb products in 30 cycles. Reactions with iProof Polymerase used a two-step protocol with a combined annealing and extension step, while the other reactions used three-step protocols with the minimum recommended extension times. Overall reaction times include temperature ramping times.

Real-Time PCR Reagent Compatibility with Instruments

Real-Time PCR Instrument	SYBR® Green Supermixes					Probes Supermixes		One-Step Kits for RT-qPCR	
	SsoAdvanced™ Universal SYBR® Green Supermix	SsoAdvanced™ Universal Inhibitor-Tolerant SYBR® Green Supermix	iTaq™ Universal SYBR® Green Supermix	iQ™ SYBR® Green Supermix	iQ Multiplex Powermix	SsoAdvanced Universal Probes Supermix	iTaq Universal Probes Supermix	iTaq™ Universal SYBR® Green One-Step Kit	iTaq Universal Probes One-Step Kit
Bio-Rad									
CFX96™, CFX96 Touch™, CFX96 Touch Deep Well, CFX384™, CFX384 Touch™, CFX Connect™	✓	✓	✓	✓	✓	✓	✓	✓	✓
iQ™, iQ™5, MyiQ™, MyiQ™2	✓	✓	✓	✓	✓	✓	✓	✓	✓
MiniOpticon™, DNA Engine Opticon I and II	✓	✓	✓	✓	✓	✓	✓	✓	✓
Applied Biosystems									
StepOne/StepOnePlus	✓	✓	✓	◆	◆	✓	✓	✓	✓
7500, ViiA 7	✓	✓	✓	—	—	✓	✓	✓	✓
7000, 7300, 7700, 7900HT, QuantStudio Systems	✓	✓	✓	—	—	✓	✓	✓	✓
Stratagene									
Mx3000P, 3005P, 4000	✓	✓	✓	✓	✓	✓	✓	✓	✓
Eppendorf									
Mastercycler ep <i>realplex</i> 2, 4	✓	✓	✓	✓	✓	✓	✓	✓	✓
QIAGEN/Corbett									
Rotor-Gene 3000, 6000, Q	✓	✓	✓	✓	✓	✓	✓	✓	✓
Roche									
LightCycler 480, 96	✓	✓	✓	✓	✓	✓	✓	✓	✓
LightCycler 1.0, 1.5, 2.0	▲	▲	▲	▲	▲	▲	▲	▲	▲
BioFire									
LightScanner HR-1	✓	✓	✓	✓	✓	✓	✓	✓	✓
LightScanner 32	▲	▲	▲	▲	▲	▲	▲	▲	▲

✓ Recommended for use as is ◆ ROX reference setting must be turned off ▲ BSA must be added according to instrument specifications — Not compatible

4 PCR AND REAL-TIME PCR REAGENTS

Ordering Information

Ordering Information

Catalog # Description

SsoAdvanced Universal Supermixes

1725270	SsoAdvanced Universal SYBR Green Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725271	SsoAdvanced Universal SYBR Green Supermix , 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725272	SsoAdvanced Universal SYBR Green Supermix , 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725274	SsoAdvanced Universal SYBR Green Supermix , 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725275	SsoAdvanced Universal SYBR Green Supermix , 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions
1725280	SsoAdvanced Universal Probes Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725281	SsoAdvanced Universal Probes Supermix , 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725282	SsoAdvanced Universal Probes Supermix , 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725284	SsoAdvanced Universal Probes Supermix , 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725285	SsoAdvanced Universal Probes Supermix , 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions
1725016	SsoAdvanced Universal Inhibitor-Tolerant SYBR Green Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725017	SsoAdvanced Universal Inhibitor-Tolerant SYBR Green Supermix , 5 ml (1 x 5 ml vial), 500 x 20 µl reactions
1725018	SsoAdvanced Universal Inhibitor-Tolerant SYBR Green Supermix , 10 ml (2 x 5 ml vials), 1,000 x 20 µl reactions

Catalog # Description

iTaq Universal Supermixes

1725120	iTaq Universal SYBR Green Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725121	iTaq Universal SYBR Green Supermix , 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725122	iTaq Universal SYBR Green Supermix , 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725124	iTaq Universal SYBR Green Supermix , 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725125	iTaq Universal SYBR Green Supermix , 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions
1725130	iTaq Universal Probes Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725131	iTaq Universal Probes Supermix , 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725132	iTaq Universal Probes Supermix , 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725134	iTaq Universal Probes Supermix , 25 ml (5 x 5 ml vials), 2,500 x 20 µl reactions
1725135	iTaq Universal Probes Supermix , 50 ml (10 x 5 ml vials), 5,000 x 20 µl reactions

iTaq Universal One-Step Kits

1725150	iTaq Universal SYBR Green One-Step Kit , 1 ml (1 x 1 ml vial), 100 x 20 µl reactions
1725151	iTaq Universal SYBR Green One-Step Kit , 5 ml (5 x 1 ml vials), 500 x 20 µl reactions
1725140	iTaq Universal Probes One-Step Kit , 1 ml (1 x 1 ml vial), 100 x 20 µl reactions
1725141	iTaq Universal Probes One-Step Kit , 5 ml (5 x 1 ml vials), 500 x 20 µl reactions



Visit [bio-rad.com/RT-PCRreagents](https://www.bio-rad.com/RT-PCRreagents)
for additional real-time PCR reagents.

Catalog # Description

iQ Supermixes

1725848	iQ Multiplex Powermix , 1.25 ml (1 x 1.25 ml vial), 50 x 50 µl reactions
1725849	iQ Multiplex Powermix , 5 ml (4 x 1.25 ml vials), 200 x 50 µl reactions
1708880	iQ SYBR Green Supermix , 2.5 ml (2 x 1.25 ml vials), 100 x 50 µl reactions
1708882	iQ SYBR Green Supermix , 12.5 ml (10 x 1.25 ml vials), 500 x 50 µl reactions
1708884	iQ SYBR Green Supermix , 25 ml (20 x 1.25 ml vials), 1,000 x 50 µl reactions
1708885	iQ SYBR Green Supermix , 50 ml (50 ml bottle), 2,000 x 50 µl reactions
1708886	iQ SYBR Green Supermix , 25 ml (5 x 5 ml vials), 1,000 x 50 µl reactions
1708887	iQ SYBR Green Supermix , 50 ml (10 x 5 ml vials), 2,000 x 50 µl reactions
1708860	iQ Supermix , 2.5 ml (2 x 1.25 ml vials), 100 x 50 µl reactions
1708862	iQ Supermix , 12.5 ml (10 x 1.25 ml vials), 500 x 50 µl reactions

Catalog # Description

Standard PCR Reagents

1725310	iProof HF Master Mix , 0.04 U/µl, 100 x 50 µl reactions
1725320	iProof GC Master Mix , 0.04 U/µl, 100 x 50 µl reactions
1725300	iProof High-Fidelity DNA Polymerase , includes 5x reaction buffers, MgCl ₂ , and DMSO, 20 U, 2 U/µl
1725301	iProof High-Fidelity DNA Polymerase , includes 5x reaction buffers, MgCl ₂ , and DMSO, 100 U, 2 U/µl
1725302	iProof High-Fidelity DNA Polymerase , includes 5x reaction buffers, MgCl ₂ , and DMSO, 500 U, 2 U/µl
1725330	iProof High-Fidelity PCR Kit , includes 5x reaction buffers and DNA control, 50 U, 2 U/µl
1725331	iProof High-Fidelity PCR Kit , includes 5x reaction buffers and DNA control, 200 U, 2 U/µl
1708870	iTaq DNA Polymerase , 250 U, 5 U/µl
1708875	iTaq DNA Polymerase , 5,000 U, 5 U/µl
1725858	ROX Passive Reference Dye , 0.5 ml
1708874	dNTP Mix , 200 µl

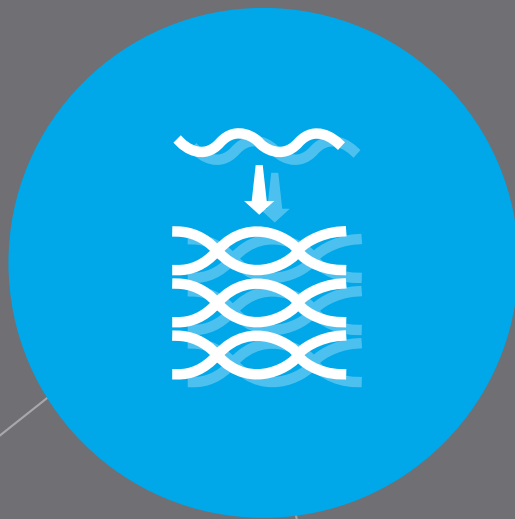
Additional Real-Time PCR Reagents

1725110	Precision Melt Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions
1725112	Precision Melt Supermix , 10 ml (10 x 1 ml vials), 1,000 x 20 µl reactions
1725555	Precision Blue Real-Time PCR Dye , 55 µl (1 x 1 ml vial), 500 x 20 µl reactions



Visit [bio-rad.com/RT-PCRreagents](https://www.bio-rad.com/RT-PCRreagents)
for additional real-time PCR reagents.

5 PREAMPLIFICATION



Preamplification is a powerful tool to enable highly sensitive detection of a large number of targets from a limited sample.

- Proprietary buffers and Sso7d fusion technology generate unbiased preamplification reactions
- Optimized for PrimePCR™ PreAmp Assays
- Unparalleled sensitivity

Preamplification Selection Guide

Preamplification is a valuable tool that enables researchers to enrich specific gene targets of interest from a limited sample. Selecting a preamplification kit that provides unbiased preamplification is key to successful gene expression analysis.

Product	Description	Key Benefits
iScript™ Explore One-Step RT and PreAmp Kit	cDNA synthesis and preamplification performed in a single step <ul style="list-style-type: none"> RNA used as input sample Reverse transcription carried out using gene-specific priming 	<ul style="list-style-type: none"> Unbiased preamplification Protocol minimizes hands-on time Compatible with PrimePCR™ PreAmp Control Kit integrates an effective gDNA digestion step
SsoAdvanced™ PreAmp Supermix	cDNA synthesis and preamplification performed in separate steps <ul style="list-style-type: none"> cDNA synthesis carried out using any of the iScript family of reverse transcription reagents cDNA used as input sample for preamplification reaction Reverse transcription carried out using gene-specific priming 	<ul style="list-style-type: none"> Unbiased preamplification Flexibility with cDNA synthesis method of choice cDNA can be archived for future studies of different genes

Ideal Sample Types for Preamplification

- FFPE samples
- LCM samples
- Plant samples
- Rare samples
- Single cells
- Small biopsies
- Sorted cells
- Stem cells

5 PREAMPLIFICATION

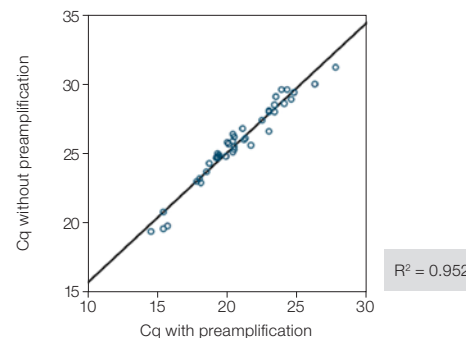
iScript™ Explore One-Step RT and PreAmp Kit

iScript™ Explore One-Step RT and PreAmp Kit

iScript Explore One-Step RT and PreAmp Kit features:

- **1-step reverse transcription and preamplification** — the first kit that eliminates protocol steps by generating preamplified cDNA from RNA in a single step
- **Unbiased preamplification** — can reliably profile panels of targets
- **High sensitivity** — enables reliable detection of genes expressed at low levels
- **Preamplification control** — preamplification efficacy can be easily assessed when used with PrimePCR™ Long Noncoding RNA (lncRNA) Arrays or custom PrimePCR Plates
- **Effective genomic DNA removal** — provides confidence that results are only for the transcript of interest

Preamplification Does Not Introduce Bias



High correlation between preamplified and non-preamplified samples. Potential for bias was evaluated using External RNA Controls Consortium (ERCC) RNA transcripts of a known copy number. ERCC concentrations from single copy to 16,000 copies were used to assess bias across a wide range of transcript concentrations. RNA samples were reverse transcribed using iScript Advanced cDNA Synthesis Kit for RT-qPCR or reverse transcribed and preamplified using iScript Explore One-Step RT and PreAmp Kit. The R^2 value of 0.952 indicates a high correlation between samples with and without preamplification, demonstrating that preamplification does not introduce bias. Cq, quantification cycle.



Visit [bio-rad.com/iScriptExplore](https://www.bio-rad.com/iScriptExplore) for more information.

SsoAdvanced™ PreAmp Supermix

SsoAdvanced PreAmp Supermix provides unbiased, target-specific preamplification from limited nucleic acids using up to 100 qPCR or end-point assays and enabling more downstream reactions for screening of respective targets.

Features of SsoAdvanced PreAmp Supermix

- Unbiased preamplification for accurate expression analysis from limited sample
- Requires as little as 100 pg of gDNA or cDNA
- Validated for SYBR® Green and probe chemistries
- Optimized for PrimePCR™ PreAmp Assays
- Improved performance using TaqMan and custom assays
- Superior sensitivity and efficiency
- Economically priced

Ordering Information

Catalog #	Description
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iScript Explore One-Step RT and PreAmp Kits

12004856	iScript Explore One-Step RT and PreAmp Kit, 50 x 50 µl reactions
17002826	iScript Explore One-Step RT and PreAmp Kit, 250 x 50 µl reactions

SsoAdvanced PreAmp Supermix

1725160	SsoAdvanced PreAmp Supermix, 1.25 ml (1 x 1.25 ml vial), 50 x 50 µl reactions
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This guide provides a comparison of PreAmp products.

Property	SsoAdvanced PreAmp Supermix	TaqMan PreAmp Master Mix (Thermo Fisher Scientific)	PerfeCTa PreAmp 5x SuperMix (Quanta BioSciences)
Bias quantification score	90% ≤ 0.75	90% ≤ 1.50	90% ≤ 1.50
Sensitive detection of low-level target genes	•••	••	•
High efficiency, even for difficult amplicons	•••	••	••
Validated assays	PrimePCR™ PreAmp, TaqMan	TaqMan	Unknown
SYBR® Green Assays	✓		✓
Probe assays	✓	✓	✓
Number of reactions	50 x 50 µl	40 x 50 µl	40 x 50 µl

• Fair •• Good ••• Excellent

Bias Quantification Score

A bias quantification (BQ) score provides a numerical value for the level of bias observed in a preamplification reaction. It is based on comparing the theoretical difference between a sample with and without PreAmp compared to the observed (actual) difference between a sample with and without PreAmp. Zero indicates no bias, and the farther from zero the BQ score becomes, the greater the bias introduced.



Visit [bio-rad.com/PreAmp](https://www.bio-rad.com/PreAmp) or download or request bulletin **6576**.

6 PCR PLASTIC CONSUMABLES

A large selection of PCR tubes, PCR plates, seals, and accessories are precisely manufactured for optimal fit and cycling performance in thermal cyclers and real-time PCR systems.



- Produced in Class 10,000 or 100,000 cleanroom environment
- Certified to be free of DNase, RNase, and human gDNA
- Extremely uniform wells reduce well-to-well variability in real-time PCR
- Warp-free Hard-Shell® Plates are designed for optimum performance with automation

Instrument Compatibility

Catalog #	Tubes		
	Individual High-Profile	Strips High-Profile	Strips Low-Profile
	TBI0201, TFI0201, TWI0201	TBCxxxx, TBSxxxx	TLStxxx
Thermal Cycler			
Bio-Rad® C1000™, C1000 Touch™, S1000™	✓	▲	✓
Bio-Rad® DNA Engine, DNA Engine Tetrad, DNA Engine Tetrad 2, DNA Engine Dyad, Dyad Disciple™, PTC-100	✓	▲	✓
Bio-Rad® T100™, MyCycler™	✓	✓	
Bio-Rad iCycler	✓	✓	
Bio-Rad® MJ Mini™	✓	▲	✓
Applied Biosystems 0.2 ml Tube Cyclers (2720, 9700, Veriti)	✓	✓	
Applied Biosystems 0.1 ml Tube Cyclers (9800 Fast, Veriti Fast)			✓
Eppendorf Mastercycler Series	✓	▲	✓
Real-Time PCR Instrument			
Bio-Rad® CFX96™, CFX96 Touch™, CFX96 Touch Deep Well, CFX Connect™			✓
Bio-Rad® iCycler iQ, iQ™5, MyiQ™, MyiQ™2		✓	
Bio-Rad® Chromo4™		▲	✓
Bio-Rad DNA Engine Opticon, Opticon 2			✓
Bio-Rad® MiniOpticon™*			✓
Applied Biosystems Standard Systems (7300, 7500, 7900HT)		✓	
Applied Biosystems Fast Systems (7500 Fast, 7900HT Fast, StepOne, StepOnePlus)			✓
Eppendorf Mastercycler ep <i>realplex</i>		▲	✓
Stratagene (Agilent) Mx Series		✓	
QIAGEN/Corbett Rotor-Gene	✓		

✓ Recommended ▲ Compatible

* The MiniOpticon Real-Time PCR Detection System is factory calibrated for white tubes and white-well plates. White plastics are recommended due to their superior signal-to-noise ratio. Using clear tubes or clear-well plates on this instrument will require user calibration.

6 PCR PLASTIC CONSUMABLES

Instrument Compatibility

Catalog #	96- and 48-Well Plates							384-Well Plates	
	Hard-Shell® Semi-Skirted High-Profile	Hard-Shell Skirted Low-Profile	Hard-Shell Semi-Skirted Low-Profile	Hard-Shell 480	Multiplate™ Unskirted High-Profile	Multiplate Unskirted Low-Profile	iQ™ Semi-Skirted High-Profile	Hard-Shell Standard	Hard-Shell 480
	HSS9xxx	HSP9xxx	HSL9xxx	HSR99xx	MLPxxxx	MLLxxxx	2239441	HSP3xxx	HSR48xx
Thermal Cycler									
Bio-Rad® C1000™, C1000 Touch™, S1000™	▲	✓	▲		▲	▲	▲	✓	▲
Bio-Rad® T100™	✓				▲		▲		
Bio-Rad DNA Engine, DNA Engine Tetrad, DNA Engine Tetrad 2, DNA Engine Dyad	▲	✓			▲	▲	▲	✓	▲
Bio-Rad® iCycler, MyCycler™	✓ Except MyCycler				✓		▲		
Bio-Rad® MJ Mini™					▲	✓			
Applied Biosystems 0.2 ml Tube Cyclers (2720, 9700, Veriti)	✓				▲		▲		
Applied Biosystems 0.1 ml Tube Cyclers (9800 Fast, Veriti Fast)			✓			✓			
Applied Biosystems 384-Well Cyclers (9700, Veriti)								✓	▲
Eppendorf Mastercycler Series	▲	✓	▲		▲	▲	▲	✓	▲
Real-Time PCR Instrument									
Bio-Rad® CFX96™, CFX96 Touch™, CFX Connect™, CFX384™*, CFX384 Touch™*		✓	▲			▲		✓	▲
Bio-Rad CFX96 Touch Deep Well	▲	✓							
Bio-Rad® iCycler iQ, iQ™5, MyiQ™, MyiQ™2	▲				▲		✓		
Bio-Rad® DNA Engine Opticon, Opticon 2, MiniOpticon™*		✓ Except MiniOpticon				▲			
Applied Biosystems Standard Systems (7300, 7500, 7900HT, QuantStudio Systems, ViiA 7)	✓				▲ Except 7900HT, QuantStudio		▲ Except 7900HT, QuantStudio	✓	▲
Applied Biosystems Fast Systems (7500 Fast, 7900HT Fast, StepOne, StepOnePlus, QuantStudio Systems, ViiA 7 Fast)			✓ Except StepOne, StepOnePlus, 7900HT Fast			▲ Except 7900HT Fast		✓	▲
Eppendorf Mastercycler ep <i>realplex</i>	▲	✓	▲		▲	▲	▲		
Stratagene (Agilent) Mx Series	✓				▲		▲		
Roche LightCycler 96, 480				✓					✓

✓ Recommended ▲ Compatible

* CFX384, CFX384 Touch, and MiniOpticon Real-Time PCR Detection Systems are factory calibrated for white tubes and white-well plates. White plastics are recommended due to their superior signal-to-noise ratio. Using clear tubes or clear-well plates on these instruments will require user calibration.

Contact Bio-Rad technical support for compatibility with additional instruments.



Go to [bio-rad.com/PCRPlasticSelector](https://www.bio-rad.com/PCRPlasticSelector) and use our interactive selection tool to find the PCR plastics that fit your instrument.

PCR Tubes and Strips

0.2 and 0.5 ml Individual PCR Tubes

- High-profile PCR tubes with double-locking caps for a stronger seal during cycling
- Flat, frosted caps are easy to label
- Options with attached caps for greater convenience and lower risk of contamination

High-Profile PCR Tube Strips

- Thin-walled tubes for superior heat transfer
- 8- and 12-tube strips for use on 48- or 96-well sample blocks
- Available in a variety of colors for easy sample tracking
- Maximum volume: 300 µl

Low-Profile PCR Tube Strips

- Lower height reduces the potential for condensation
- Designed to allow greater light capture in fluorescence assays
- Opaque white color option maximizes detection signal
- Maximum volume: 200 µl

Flat and Domed Cap Strips for PCR Tubes and PCR Plates

- Ultraclear flat cap strips are ideal for qPCR
- Designed for extremely tight sealing for thermal cycling and storage (–20 and 4°C)
- Flat caps have optimal light transmittance for real-time PCR on PCR tubes or plates
- Great option to save plates if fewer wells are needed during PCR



ECT2000
Strip Cap Tool



TLS0801, clear
TLS0851, white
Low-Profile Tube Strips without Caps



TBS0201, 8-tube, clear
TBS1201, 12-tube, clear
High-Profile Tube Strips without Caps



TCS0803, ultraclear
Optical Flat 8-Cap Strips



TCS0801, 8-cap, clear
TCS1201, 12-cap, clear
Domed Cap Strips

6 PCR PLASTIC CONSUMABLES

PCR Plates

PCR Plates

Multiplate™ 96-Well and 48-Well Unskirted PCR Plates

- Single-component polypropylene allows low protein binding and excellent sample retention
- High-profile (20.7 mm) and low-profile (15.5 mm) options allow broad real-time PCR instrument compatibility
- White-well option for maximizing real-time PCR detection sensitivity
- Designed to allow easy cutting with scissors (when less than a full plate is needed)

iQ™ High-Profile 96-Well Semi-Skirted PCR Plates

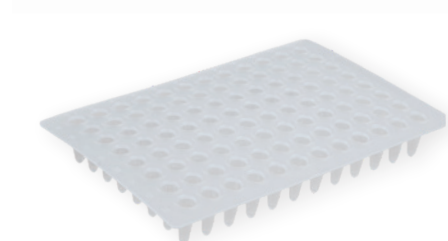
- Semi-skirt design provides a labeling surface for easy sample tracking
- Composition designed to provide stiffness during plate handling
- High-profile (20.7 mm) plate has perforations every 3 columns for convenience (when less than a full plate is needed)



MLP4801, clear
Multiplate High-Profile 48-Well
Unskirted PCR Plates



MLL4801, clear
MLL4851, white
Multiplate Low-Profile 48-Well
Unskirted PCR Plates



MLL9601, clear
Multiplate Low-Profile 96-Well
Unskirted PCR Plates



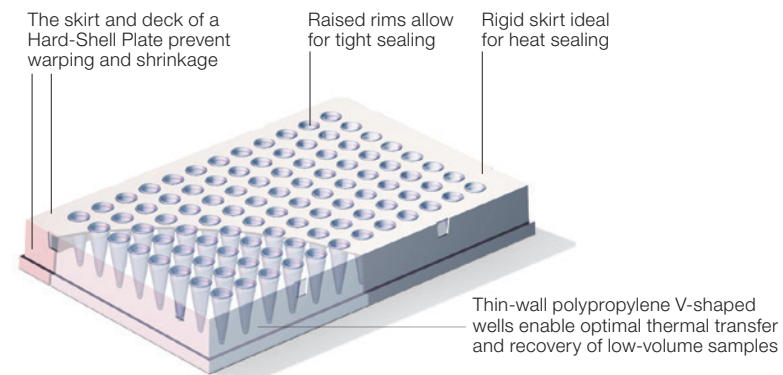
2239441
iQ High-Profile 96-Well
Semi-Skirted PCR Plates

Hard Shell® PCR Plates

Hard-Shell Technology

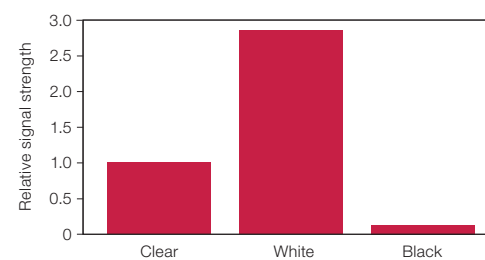
The patented two-component design of Hard-Shell Plates is specifically engineered to withstand the stresses of thermal cycling. Benefits include:

- Superior stability and flatness allow precise positioning and robotic handling
- Sturdy plate design is ideal for heat sealing methods
- Warp-resistant feature provides durability during automation, high-speed centrifugation, and storage (even -80°C)
- User-readable barcode options for convenient sample tracking in high-throughput settings
- Black alphanumeric labeling for easy well identification
- Footprint and well spacing designed to match ANSI/SBS standard dimensions
- Composition helps prevent DNA binding
- Polypropylene resin allows superior well-to-well uniformity for reliable and reproducible real-time qPCR results



HSP9955, white shell, white well, barcoded
Hard-Shell Low-Profile 96-Well Skirted PCR Plates
Other colors and barcode option are available.

Enhanced Real-Time PCR Sensitivity

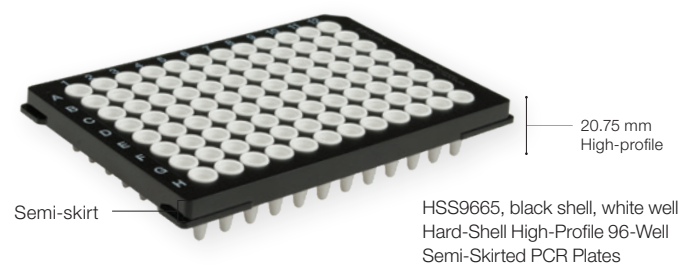
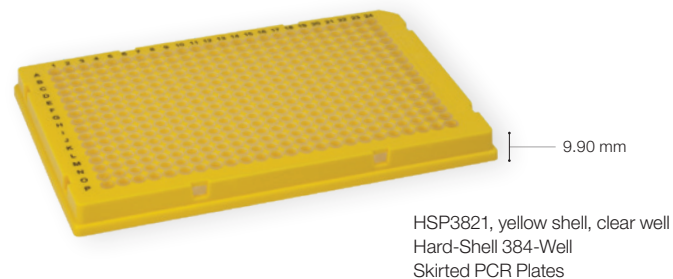
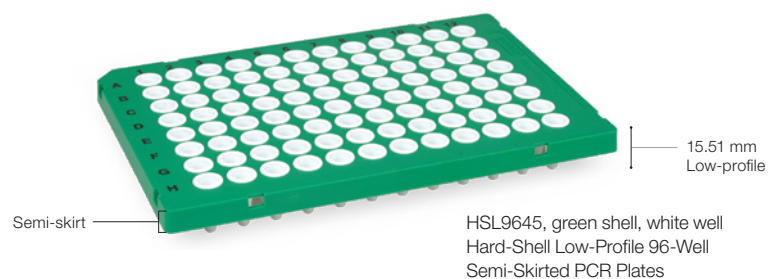


For more information,
download bulletin **5496**.

6 PCR PLASTIC CONSUMABLES

Hard-Shell® PCR Plates

Hard-Shell® PCR Plates



For more information,
download bulletin **5496**.

PCR Plate Sealing

PX1™ PCR Plate Sealer

The PX1 PCR Plate Sealer is a semiautomated heat sealer for consistent and uniform sealing across an entire microplate. Features include:

- Intuitive touch-screen user interface for extreme convenience and ease of use
- Programmable sealing protocols for quick access
- Small footprint suitable for crowded laboratory benches
- Compatible with a variety of heat sealing films and foils and a wide range of PCR plates



Seals Validated for PX1 PCR Plate Sealer

Optically Clear Heat Seal

- Ideal for real-time PCR
- Excellent optical clarity
- Peelable for easy sample retrieval
- Compatible with PCR

Permanent Clear Heat Seal

- Ideal for water bath cycling
- Nonpeelable, nonpierceable seal
- High solvent resistance

Pierceable Foil Heat Seal

- Fully validated for the QX200™ Droplet Digital™ PCR System workflow
- Easily pierceable with a pipet tip
- User friendly — colored stripe clearly identifies sealing surface
- Compatible with PCR

Peelable Foil Heat Seal

- Ideal for low-temperature sample storage
- Can be easily peeled from microplates stored in a –80°C freezer or in liquid nitrogen
- Compatible with PCR



For more information, download or request bulletin **6257**.

6 PCR PLASTIC CONSUMABLES

PCR Plate Sealing

Microseal 'B' Adhesive Seals, Optically Clear

- Strongest adhesive-based optically clear sealing option designed for real-time PCR plates
- Withstands multiple storage or transport temperatures (–40 to 110°C)

Microseal 'C' Optical Seals

- Optically clear adhesive films designed for tight seals even with wells with raised rims
- Pressure-sensitive adhesive allows easy application during plate sealing
- Designed with superior optical properties for real-time PCR



MSB1001
Microseal 'B' Adhesive Seals



MSC1001
Microseal 'C' Optical Seals



MSA5001
Microseal 'A' Film



MSF1001
Microseal 'F' Foil



MSR0001
Sealing Roller

Microseal 'F' Foil

- Aluminum foil allows opaque sealing option for DNA sequencing (ABI 3700 DNA Analyzer) and sample storage
- Acts as a barrier against evaporation in extreme temperatures (–80 to 105°C)
- Pierceable foil for easy sample retrieval

Microseal 'A' Film

- A nonoptical, nonadhesive sealing option for quick pressure-based sealing of plates
- Allows easy removal without the risk of aerosol formation, minimizing cross-contamination
- Convenient option for standard PCR needs

Ordering Information

Catalog # Description

PCR Plate Sealing

1814000	PX1 PCR Plate Sealer , includes heat sealing instrument, 96-well/384-well plate support block, sealing frame, power cord
1814030	Optically Clear Heat Seal , 100 seals
1814035	Permanent Clear Heat Seal , 100 seals
1814040	Pierceable Foil Heat Seal , 100 seals
1814045	Peelable Foil Heat Seal , 100 seals
MSA5001	Microseal 'A' Film , 50 seals
MSB1001	Microseal 'B' Adhesive Seals , optically clear, 100 seals
MSC1001	Microseal 'C' Optical Seals , 100 seals
MSF1001	Microseal 'F' Foil , 100 seals
MSR0001	Sealing Roller , for film seals

Ordering Information

Catalog #	Description
Individual PCR Tubes	
TFI0201	PCR Tubes with Flat Caps (0.2 ml), clear, 1,000
TWI0201	PCR Tubes with Domed Caps (0.2 ml), clear, 1,000
TBI0201	PCR Tubes without Caps (0.2 ml), clear, 1,000
TBI0501	PCR Tubes with Flat Caps (0.5 ml), clear, 1,000 (2 bags of 500)
TBI0502	PCR Tubes with Flat Caps (0.5 ml), clear, 800 (8 bags of 100)
PCR Tube Strips	
TBS0201	8-Tube Strips without Caps, clear, 120 strips (960 PCR tubes)
TBS1201	12-Tube Strips without Caps, clear, 100 strips (1,200 PCR tubes)
TBC0802	8-Tube Strips and Domed Cap Strips, clear, 20 bags of 12 x 8-tube strips and 12 x 8-cap strips (1,920 PCR tubes and 1,920 caps)
TBC1202	12-Tube Strips and Domed Cap Strips, clear, 20 bags of 8 x 12-tube strips and 8 x 12-cap strips (1,920 PCR tubes and 1,920 caps)
TLS0801	Low-Profile 8-Tube Strips without Caps, clear, 120 (960 PCR tubes)
TLS0851	Low-Profile 8-Tube Strips without Caps, white, 120 (960 PCR tubes)
Cap Strips	
TCS0801	Domed 8-Cap Strips, for PCR tubes and plates, clear, 120
TCS1201	Domed 12-Cap Strips, for PCR tubes and plates, clear, 200
TCS0803	Optical Flat 8-Cap Strips, for PCR tubes and plates, ultraclear, 120
Capping Tools and Racks	
TRC9601	PCR Tube Rack, ANSI/SBS standard, white, 10
TRC0501	96-Place Racks, with covers, for PCR tubes and unskirted and semi-skirted microplates, assorted colors, 5
ECT1000	Easy Cap Tool, ensures tight seal for 0.2 ml PCR tubes or 96-well microplates
ECT2000	Strip Cap Tool, for sealing 8- and 12-cap strips on PCR plates or tubes
PCR Plates	
Multiplate 48-Well PCR Plates	
MLP4801	Multiplate High-Profile 48-Well Unskirted PCR Plates, clear, 50 plates
MLL4801	Multiplate Low-Profile 48-Well Unskirted PCR Plates, clear, 50 plates
MLL4851	Multiplate Low-Profile 48-Well Unskirted PCR Plates, white, 50 plates
Multiplate High-Profile 96-Well Unskirted PCR Plates	
MLP9601	Multiplate High-Profile 96-Well Unskirted PCR Plates, clear, 25 plates
MLP9651	Multiplate High-Profile 96-Well Unskirted PCR Plates, white, 25 plates
MLP9631	Multiplate High-Profile 96-Well Unskirted PCR Plates, blue, 25 plates
Multiplate Low-Profile 96-Well Unskirted PCR Plates	
MLL9601	Multiplate Low-Profile 96-Well Unskirted PCR Plates, clear, 25 plates
MLL9651	Multiplate Low-Profile 96-Well Unskirted PCR Plates, white, 25 plates
iQ High-Profile 96-Well Semi-Skirted PCR Plates	
2239441	iQ High-Profile 96-Well Semi-Skirted PCR Plates, 25 plates

Description	Clear Well	White Well	Black Well
Hard-Shell Plates			
Hard-Shell Low-Profile 96-Well Skirted PCR Plates (50 plates)			
White shell	HSP9601	HSP9655	—
Red shell	HSP9611	—	—
Yellow shell	HSP9621	—	—
Blue shell	HSP9631	HSP9635	—
Green shell	HSP9641	HSP9645	—
Black shell	HSP9661	HSP9665	HSP9666
White shell, barcoded (Row H and Column 12)	HSP9901	HSP9955	—
Hard-Shell High-Profile 96-Well Semi-Skirted PCR Plates (25 plates)			
Clear shell	HSS9601	—	—
Green shell	HSS9641	—	—
Black shell	—	HSS9665	—
Clear shell, barcoded (Row H, Column 1, and Column 12)	HSS9901	—	—
Hard-Shell Low-Profile 96-Well Semi-Skirted PCR Plates (25 plates)			
Clear shell	HSL9601	HSL9605	—
Green shell	HSL9641	HSL9645	—
Clear shell, barcoded (Row H and Column 12)	HSL9901	HSL9905	—
Hard-Shell 384-Well Standard PCR Plates (50 plates)			
Clear shell	HSP3801	HSP3805	—
Red shell	HSP3811	—	—
Yellow shell	HSP3821	—	—
Blue shell	HSP3831	—	—
Green shell	HSP3841	—	—
Black shell	—	HSP3865	HSP3866
Clear shell, barcoded (Row P and Column 24)	HSP3901	HSP3905	—
Description		Number of Plates	Number of Plates and Seals
		25 Plates	100 Plates, 100 Microseal 'C' Seals
Hard-Shell 96-Well 480 PCR Plates (with barcode on Row A side)			
Clear shell, white well		HSR9905	HSR9905K
Clear shell, clear well		HSR9901	HSR9901K
		50 Plates	100 Plates, 100 Microseal 'C' Seals
Hard-Shell 384-Well 480 PCR Plates (with barcode on Row A and Column 24 side)			
Clear shell, white well		HSR4805	HSR4805K
Clear shell, clear well		HSR4801	HSR4801K

7 PrimePCR™ ASSAYS AND PANELS



PrimePCR Assays and Panels for real-time PCR are expertly designed and are guaranteed to perform.

- Expertly designed SYBR® Green and probe assays for qPCR, preamplification, and Droplet Digital™ PCR
- Wet-lab validated for guaranteed performance; each mRNA assay for the human, mouse, and rat genomes was experimentally tested for optimal efficiency, specificity, sensitivity, and linear dynamic range
- Assays available for expression analysis of messenger RNA and long noncoding RNA targets
- Compliant with the MIQE guidelines

High-Performance Assay Solutions



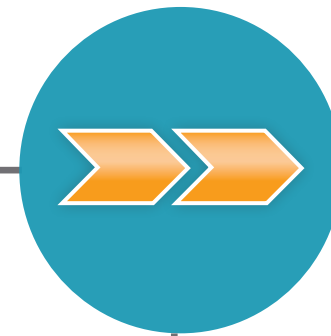
Guaranteed Performance

- Offers wet-lab validation of every mRNA assay for human, mouse, and rat genomes
- Eliminates time-consuming optimization
- Aids in MIQE compliance



Wide Range of Predesigned Disease- and Pathway-Specific Panels

- Expertly curated predesigned arrays to include the most biologically relevant gene targets
- Customizable arrays to select targets of interest
- Integrated with CFX Maestro™ Software for simple setup and analysis



Complete Solution for Real-Time PCR

- Aurum™ Total RNA Kits
- iScript™ cDNA Synthesis Kits
- Supermixes for qPCR
- Preamplification reagent kits and PrimePCR PreAmp Assays
- PCR plates and tubes
- Real-time PCR instruments
- CFX Maestro Software
- PrimePCR Analysis Software

Assay Design

Advantages

- | | | | | | |
|---|--|---|--|--|---|
| ▪ Assay specificity confirmed by next-generation sequencing | ▪ Avoided common single nucleotide polymorphisms in target regions | ▪ Designed intron-spanning assays whenever possible | ▪ Avoided secondary structures in primer annealing sites | ▪ Maximized fraction of transcript isoforms being detected | ▪ Compatible with standard assay conditions |
|---|--|---|--|--|---|

7 PrimePCR™ ASSAYS AND PANELS

PrimePCR Real-Time PCR Products

PrimePCR Real-Time PCR Products



Predefined SYBR® Green Assays

Transcriptome-wide primer assays for SYBR® Green gene expression analysis are available in 200, 1,000, or 2,500 reaction sizes.



Predefined Probe Assays

Transcriptome-wide probe assays for gene expression analysis are available in 500, 1,000, or 2,500 reaction sizes with five fluorophore options.



Custom Assays

User-defined primer and probe sequences can be ordered.



PreAmp Assays

Concentrated primers are available for target-specific preamplification of limited nucleic acid samples.



DNA Templates

Gene-specific synthetic DNA templates are designed to serve as a positive control when used with the corresponding gene assay.



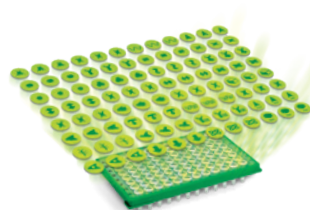
Experimental Controls

Control assays can be used to assess reverse transcription, RNA quality, gDNA contamination, and PCR performance.



Predefined Pathway Panels

A large selection of predefined disease- and pathway-specific panels are available.



Custom PCR Plates

Thousands of PrimePCR Assays are available to create custom-configured 96- and 384-well PCR plates, which can be ordered with SYBR® Green Assays.



PrimePCR Lookup Tool

Quickly find your gene targets.

Visit [bio-rad.com/PrimePCR](https://www.bio-rad.com/PrimePCR) to view our full offering of high-performance PrimePCR Assays.



Visit [bio-rad.com/PrimePCR](https://www.bio-rad.com/PrimePCR) or download bulletins **6290**, **6512**, and **6595** for more information.

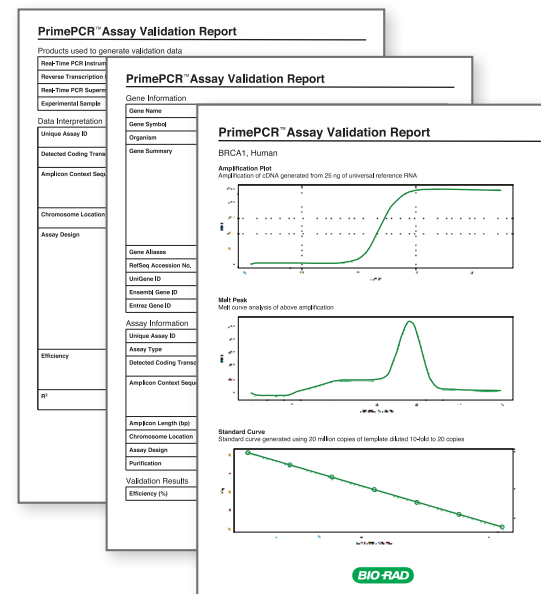
Assay Performance Standards and Validation

Assay Performance Standards

Standard	Result
Sensitivity	Accurate detection of 20 copies
Specificity	Validated amplicon sequence with next-generation sequencing; minimal primer-dimer formation and gDNA cross-reactivity
Amplification efficiency	90–110%
Linear dynamic range	Minimum of 6 orders of magnitude; detection of a synthetic template standard curve from 20 to 20,000,000 copies
R²	>0.98

Assay Validation

PrimePCR Assays for the human, mouse, and rat genomes were validated using iScript™ Advanced cDNA Synthesis Kit for RT-qPCR and SsoAdvanced™ SYBR® Green Supermix on an automated CFX384 Touch™ Real-Time PCR Detection System.



7 PrimePCR™ ASSAYS AND PANELS

Predesigned mRNA Pathway Panels

Predesigned mRNA Pathway Panels

The Most Focused Approach for Real-Time PCR

Bio-Rad collaborated with Thomson Reuters to expertly design an extensive range of predefined panels. Each real-time PCR plate contains the most biologically relevant gene targets in a canonical pathway, disease, or biological process.

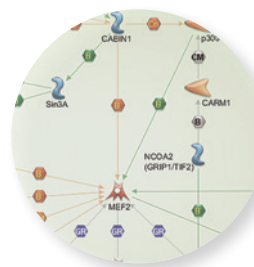
- Obtain complete pathway data from a single experiment
- Gain new insights using integrated data analysis tools



Target Ranking

Gene assays present on predefined panels have been prioritized based on three main criteria:

- How often a gene changes expression level in transcriptome studies
- How much attention was paid to this gene in the overall scientific research
- How interesting the scientific community found this gene in the last 2 years



Pathway Panels

Pathway-Focused Analysis

PrimePCR Pathway Panels were designed for more than 300 canonical pathways. Pathway panels enable complete pathway analysis for differentially expressed, top-ranked gene targets.



Collection Panels

Broad Target Exploration

PrimePCR Collection Panels represent the top-ranked gene targets for differential gene expression analysis, allowing for a more general survey of gene targets across a biological process or group.



Disease Panels

Disease-Focused Analysis

PrimePCR Disease State Panels were designed by referencing the National Library of Medicine Medical Subject Headings (MeSH) database. Disease state panels allow for the thorough investigation of previously published, differentially expressed genes within a specified pathology.

PrimePCR Panels for a Broad Range of Pathways and Disease States

Diseases

- Bacterial infections and fungal mycoses
- Cancer and neoplasms
- Cardiac hypertrophy
- Cardiovascular diseases
- Congenital, hereditary, and neonatal diseases and abnormalities
- Cystic fibrosis
- Digestive system diseases
- Endocrine system diseases
- Eye diseases
- Female urogenital diseases and pregnancy complications
- Hemic and lymphatic diseases
- Immune system diseases
- Male urogenital diseases
- Mental disorders
- Musculoskeletal diseases
- Nervous system diseases
- Nutritional and metabolic diseases
- Otorhinolaryngologic diseases
- Parasitic diseases
- Pathological conditions, signs, and symptoms
- Respiratory tract diseases
- Skin and connective tissue diseases
- Stomatognathic diseases
- Viral diseases
- Wounds and injuries

Processes

- Apoptosis and survival
- Blood coagulation
- Cell adhesion
- Cell cycle
- Chemotaxis
- Cytoskeleton remodeling
- Development
- DNA damage
- Hypoxia response
- Immune response
- Muscle contraction
- Neurophysiological process
- Oxidative stress
- Proteolysis
- Reproduction
- Transcription
- Translation
- Transport

Metabolism

- Amino acid metabolism
- Carbohydrate metabolism
- Lipid metabolism
- Nucleotide metabolism
- Regulation of lipid metabolism
- Regulation of metabolism
- Steroid metabolism
- Vitamin and cofactor metabolism
- Xenobiotic metabolism

Protein Function

- Cytokines and chemokines
- G proteins
- Growth factors
- Hormones
- Kinases
- Phosphatases
- Second messengers
- Transcription factors



More than 1,000 unique panels are available in these categories. Visit [bio-rad.com/PrimePCRpanels](https://www.bio-rad.com/PrimePCRpanels) for more information.

7 PrimePCR™ ASSAYS AND PANELS

Predesigned and Custom PrimePCR Long Noncoding RNA (lncRNA) Arrays

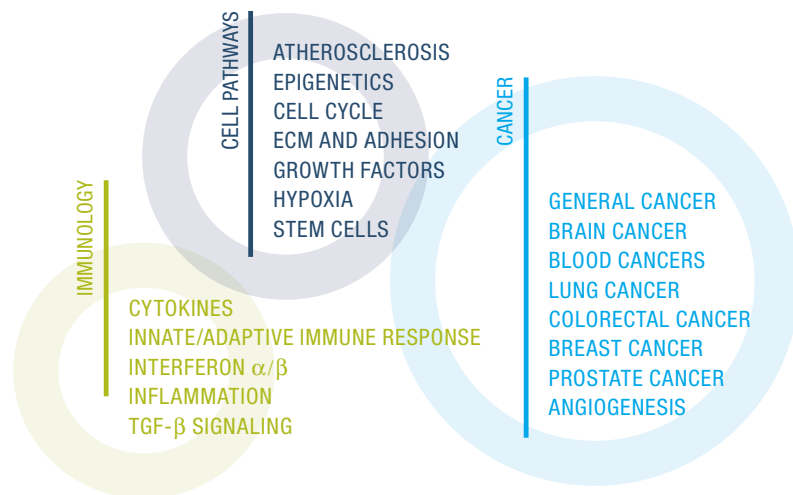
Predesigned and Custom PrimePCR Long Noncoding RNA (lncRNA) Arrays

Simplified Long Noncoding RNA Discovery

Predesigned PrimePCR lncRNA qPCR Arrays facilitate lncRNA discovery by offering panels associated with specific research areas. Each plate was curated to include a combination of frequently cited lncRNAs as well as novel lncRNAs to aid in target discovery.

- Faster preamplification setup with matching PrimePCR lncRNA PreAmp Pools
- Extensively wet-lab validated to ensure stringent performance standards are met by lncRNA assays on predefined plates
- Great companion for predefined PrimePCR mRNA Arrays

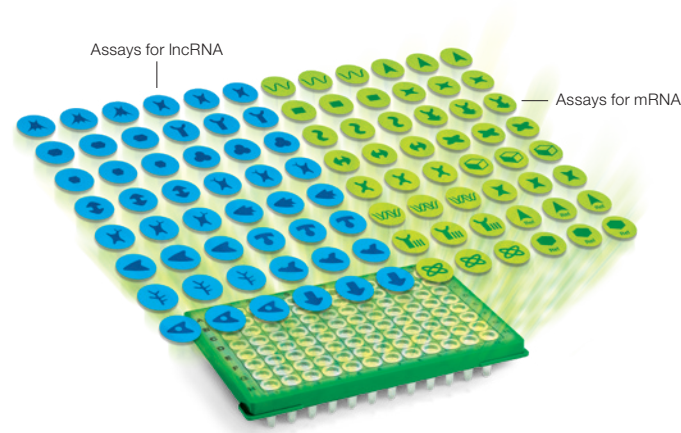
Available lncRNA Arrays



Create Your Own Long Noncoding RNA Array

Custom PrimePCR lncRNA qPCR Arrays simplify lncRNA expression research. Easily expand upon next-generation sequencing and literature data mining projects by using qPCR arrays tailored to your specific research question. Our custom qPCR arrays help move your research forward by providing a well-accepted, highly sensitive, and cost-effective approach to gene expression research. Custom qPCR arrays enable you to go from RNA sample through data analysis in a single day.

- Choose from more than 23,000 lncRNAs to customize array plates with only your targets of interest
- Simultaneously examine both lncRNA and mRNA expression patterns
- Design and include your own PCR primers on any custom plate



PrimePCR Long Noncoding RNA Assays

Assay Formats to Fit Your Needs



- lncRNA SYBR® Green Primer Assays



- lncRNA Probes Assays compatible with multiplexing. Available reporter dyes: FAM, HEX, Texas Red 615, Cy5, and Cy5.5



- Concentrated PreAmp Assays that can be used for both preamplification and downstream qPCR reactions



- DNA assay templates for every human lncRNA assay serve as a positive control

PrimePCR lncRNA Assays are also compatible with Droplet Digital™ PCR workflows.

7 PrimePCR™ ASSAYS AND PANELS

Experimental Controls and Reference Gene Assays

Experimental Controls and Reference Gene Assays

Controls

Experimental control assays and synthetic DNA templates are designed to assess the key experimental factors that may impact your real-time PCR results.

	1	2	3	4	5	6	7	8	9	10	11	12	
A	1	9	17	25	33	41	49	57	65	73	81	89/Ref	A
B	2	10	18	26	34	42	50	58	66	74	82	PAQ 1	B
C	3	11	19	27	35	43	51	59	67	75	83	PAQ 2	C
D	4	12	20	28	36	44	52	60	68	76	84	gDNA	D
E	5	13	21	29	37	45	53	61	69	77	85	PCR	E
F	6	14	22	30	38	46	54	62	70	78	86	RQ 1	F
G	7	15	23	31	39	47	55	63	71	79	87	RQ 2	G
H	8	16	24	32	40	48	56	64	72	80	88/Ref	RT	H
	1	2	3	4	5	6	7	8	9	10	11	12	

Reference Gene Assays

We have suggested a set of commonly used reference genes that can be used individually or easily screened using our preplated 96-well and 384-well reference gene panels. Reference gene assays may also be added to custom-designed plates.

PAQ 1
PAQ 2

Preamplification Quality Assay

The PrimePCR Preamplification Quality Assay is designed to work with iScript™ Explore One-Step RT and PreAmp Kit to determine the efficiency of preamplification.

gDNA

DNA Contamination Control Assay

The PrimePCR DNA Contamination Control Assay is designed to determine if gDNA is present in a sample at a level that may affect PCR results.

PCR

Positive PCR Control Assay

The PrimePCR Positive Control Assay is designed to assess how a given experimental sample may adversely affect PCR performance.

RQ 1
RQ 2

RNA Quality Assay

The PrimePCR RNA Quality Assay is designed to determine whether RNA integrity may adversely affect PCR results.

RT

Reverse Transcription Control Assay

The PrimePCR Reverse Transcription Control Assay is designed to qualitatively assess the performance of the RT reaction.

PrimePCR Data Analysis

CFX Maestro™ Software

Ordering a PrimePCR Plate or Assay is just the beginning of a seamless and integrated workflow, from reaction setup to data acquisition and analysis using CFX Maestro Software and PrimePCR Analysis Software. The expert design and wet-lab validation of PrimePCR Assays for the human, mouse, and rat genomes ensure optimal assay performance so that time once spent optimizing runs can now be devoted to analyzing and interpreting experimental results.

- Select **PrimePCR** and start a run with a single click
- Begin analyzing data in a single step by importing target, reference, and control information from a PrimePCR run file directly into the plate layout
- Combine data from multiple plates into a Gene Study to rapidly screen large numbers of targets or samples
- Use powerful data visualization tools, such as hierarchical clustering and color-matched expression levels, to identify individual targets or clusters to consider for further investigation
- View data in the PrimePCR Controls Analysis Tool and Reference Gene Selection Tool in CFX Maestro Software to easily view results of controls and identify ideal reference genes for your experiment

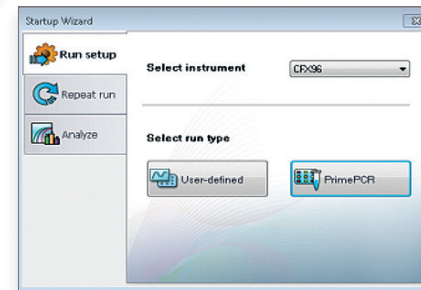
PrimePCR Runs from Start to Finish

Start runs quickly by choosing **PrimePCR** in the Startup Wizard to select the validated PrimePCR run protocol, then click **Start Run**. CFX Maestro Software is fully integrated with PrimePCR products for a fast, streamlined path from data generation to data analysis.

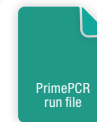
PrimePCR™ Analysis Software

For non-CFX platforms, Bio-Rad offers a PrimePCR data analysis solution. Visit bio-rad.com/PrimePCR to download the software. Easily upload Cq values and quickly generate meaningful information from your gene expression experiment.

1 Start run

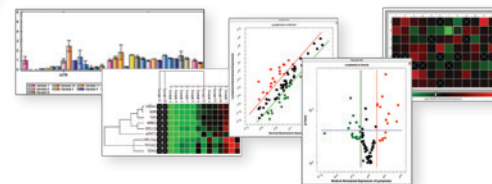


2 Apply run file



The run file autopopulates the plate layout with gene names, making multiplate data analysis quick and simple.

3 Automated data analysis



Use PrimePCR Analysis Software!
bio-rad.com/PrimePCRsoftware

8 PCR RUN AND DATA ANALYSIS



Bio-Rad's real-time PCR systems are designed to deliver outstanding thermal performance and sensitive optical detection. By pairing proven real-time instruments with quality PCR reagents and powerful analysis software, you can consistently obtain high-quality data to fuel your research discoveries.

- CFX real-time PCR detection systems efficiently provide accurate, reliable data
- CFX Maestro™ Software enables the collection and in-depth analysis of real-time data
- PrimePCR™ Analysis Software is a stand-alone data analysis tool for non-Bio-Rad instruments

Overview of CFX Systems and Software

CFX Real-Time PCR Detection Systems

Bio-Rad's real-time PCR systems are powerful, flexible, and accurate instruments for both singleplex and multiplex detection of fluorophores. The systems feature thermal gradient functionality and automation capabilities.

- CFX96 Touch™ Real-Time PCR Detection System
- CFX96 Touch Deep Well Real-Time PCR Detection System
- CFX384 Touch™ Real-Time PCR Detection System
- CFX Connect™ Real-Time PCR Detection System

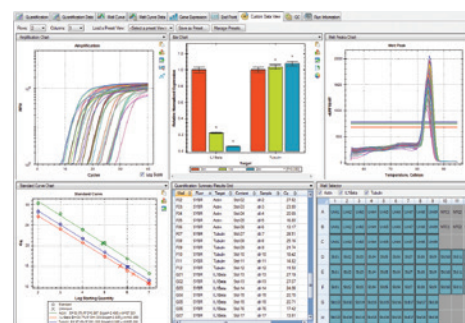
CFX Maestro™ Software

CFX Maestro Software for CFX real-time PCR systems is easy-to-use, yet flexible and powerful software for data collection, data analysis, and graphing of real-time PCR data.

With CFX Maestro Software you can:

- **Perform automatic statistical analysis in seconds** — with just a few mouse clicks you can perform *t*-tests or analyze your data with 1-way analysis of variance (ANOVA)
- **Extract more meaningful information from your run** — analyze data using bar chart, box and whisker plot, dot plot, clustergram, scatter plot, or volcano plot
- **Create and export publication-ready graphics** — annotate graphs with *P* values, text, and arrows to call out specific data. Change colors, fonts, and legends. Export graphs at any size or resolution for presentations, posters, or for publication
- **Easily integrate PrimePCR™ Assays** — use PrimePCR Primers and Plates to save time on primer design with predesigned and validated primers. Post-run, use the PrimePCR Controls Analysis Tool to ensure run quality from integrated controls

- **Work anywhere, on a PC or Mac** — with both PC and Mac versions of CFX Maestro Software, you can analyze your data on your own computer, anytime, without the need for an Internet connection (Mac version is for data analysis only and does not provide instrument control)



Custom data view. With custom data view, your most relevant data can be viewed and analyzed in one screen.

PrimePCR™ Analysis Software

For non-CFX platforms, Bio-Rad offers a PrimePCR data analysis solution. Visit bio-rad.com/PrimePCRsoftware to download the software. Easily upload Cq values and quickly generate meaningful information from your gene expression experiment.



For more information about CFX systems, download bulletins **5990**, **6093**, **6096**, and **6105**.

For more information about CFX Maestro Software, download or request bulletin **6900**.

Reference

Bustin SA et al. (2009). The MIQE guidelines: Minimum information for publication of quantitative real-time PCR experiments. Clin Chem 55, 611–622.

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Purchase of iProof High-Fidelity DNA Polymerase or iTaq DNA Polymerase includes an immunity from suit under patents specified in the product insert to use only the amount purchased for the purchaser's own internal research. No other patent rights are conveyed expressly, by implication, or by estoppel. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

Hard-Shell Plates are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 7,347,977; 6,340,589; and 6,528,302.

Visit bio-rad.com/AmpConsumables for more information.

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