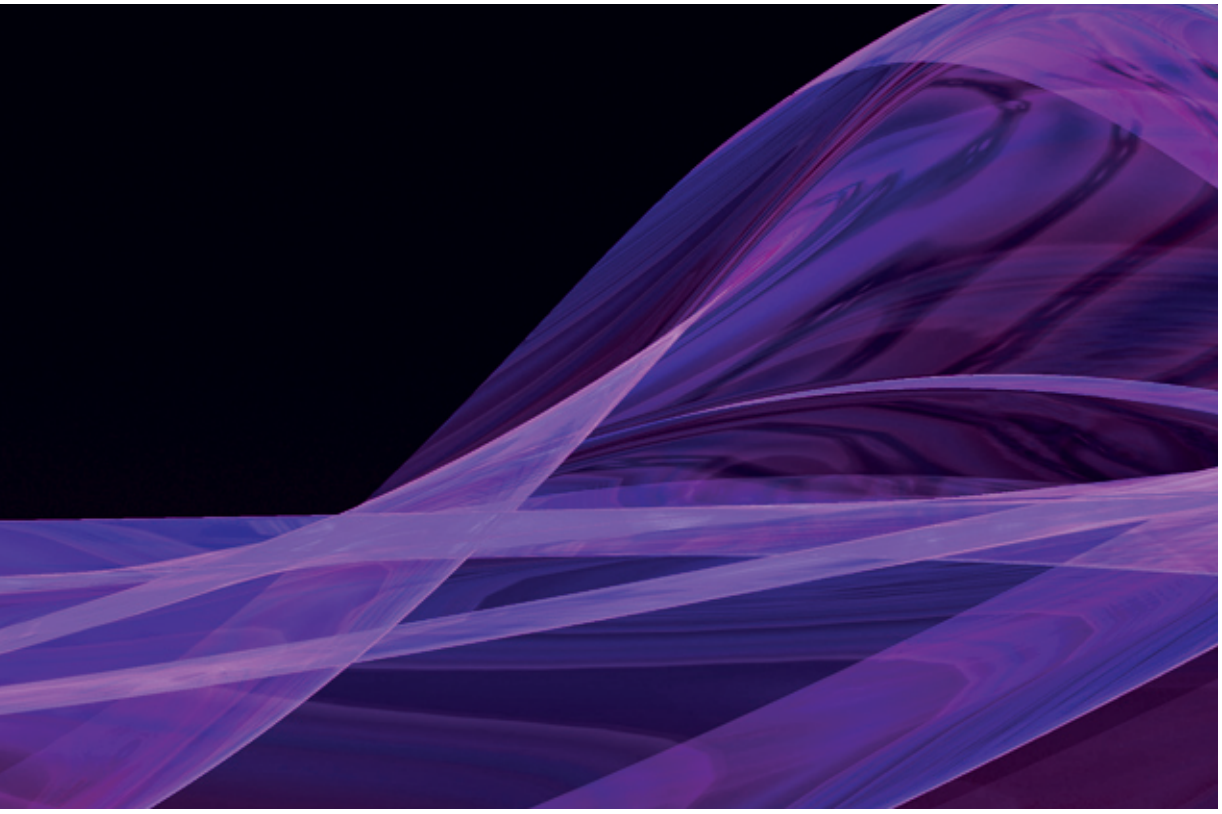


MyiQ™ and iQ™5

Real-Time PCR Detection Systems

BIO-RAD

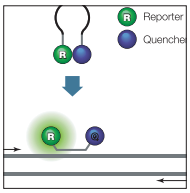
Genomic Research Solutions
From Bio-Rad

Bio-Rad is well known for making advanced genomic technologies accessible to every researcher. In addition to producing outstanding instrumentation for real-time PCR detection, Bio-Rad offers a variety of solutions for simplifying everything from assay design to gene expression analysis. This complete collection of tools provides powerful building blocks for your genomic discoveries.

Bio-Rad Offers Real-Time Instruments Designed for the Way You'd Rather Work

- Modular instruments with high-resolution optics for maximum flexibility and sensitivity
- Gradient functionality for rapid assay optimization
- Outstanding thermal performance delivered by the iCycler® thermal cycler
- PCR supermixes that provide optimum performance in real-time PCR assays
- Precisely manufactured plates, tubes, and sealers tested for optimal fit and performance in Bio-Rad real-time PCR instruments

Products for Your Genomics Workflow



Assay Design

Beacon Designer software facilitates the design and selection of primers and probes for a variety of real-time PCR applications.

Sample Preparation

Aurum™ RNA isolation kits yield fast results with the highest level of sample purity.

Sample Quality Assessment

The Experion™ automated electrophoresis system quickly and accurately measures RNA quality.

Real-Time Amplification and Analysis

A broad variety of PCR reagents and instruments provide the flexibility and reliability you need to accelerate discovery.

Smart Modular Designs

The MyiQ and iQ5 real-time PCR detection systems are 96-well modular upgrades to the iCycler thermal cycler, which delivers excellent thermal performance and thermal gradient capability. Sensitive charge-coupled device (CCD)-based optics enable accurate quantitation over a dynamic range of 9 orders of magnitude.

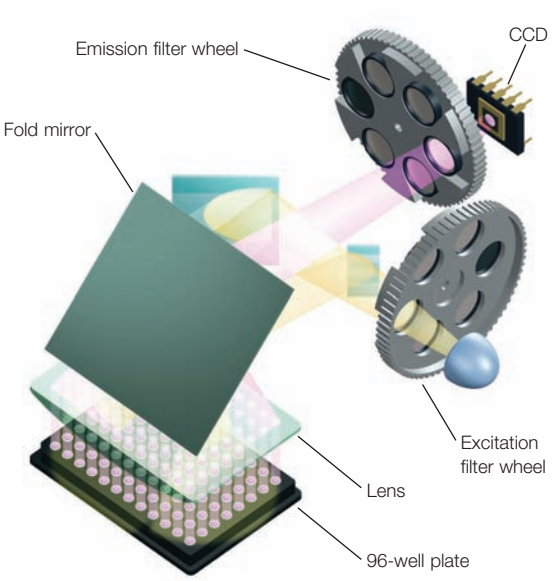
MyiQ System

The MyiQ system offers an affordable option for the detection of common green fluorescent dyes, such as FAM and SYBR Green I.

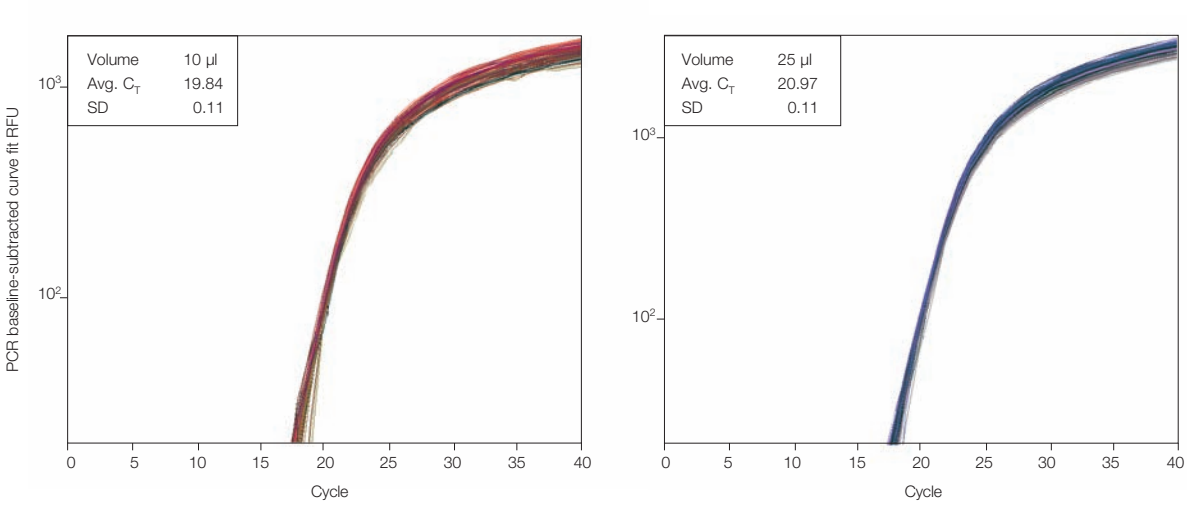
iQ5 System

The iQ5 system offers five-target analysis capabilities for multiplex PCR with a variety of detection chemistries.

The combined performance of the iCycler thermal cycler, the CCD-based optics, and Bio-Rad supermixes generates exceptionally uniform results across a 96-well block. With reaction volumes as low as 10 µl, the iQ5 and MyiQ systems produce uniform data with standard deviations of <0.15 cycles (see data below).



Optical system. Excitation of all 96 wells is achieved by a combination of narrow-bandpass filters and a tungsten-halogen lamp. Filtered light from the lamp is reflected off mirrors, passes through a condensing lens, and is focused into the center of each well. Fluorescent light emitted from the wells reflects off the main fold mirror, passes through an emission filter, and is detected by a 12-bit CCD.



Excellent uniformity. IL1-β plasmid template was diluted to 10^5 copies/reaction and amplified in the presence of a FAM-labeled detection probe with iQ™ supermix using an iQ5 real-time PCR detection system. Left panel, replicates of 10 µl reactions. Right panel, replicates of 25 µl reactions. Inset: C_T, threshold cycle; SD, standard deviation.

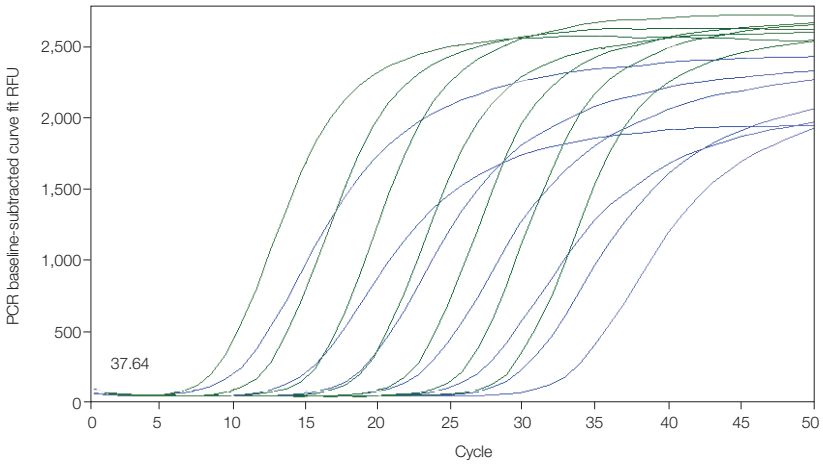
Outstanding Gradient Performance

Optimize Reactions in a Single Experiment

Bio-Rad real-time systems offer a thermal gradient feature, which allows you to optimize assays in a single experiment by using a range of temperatures simultaneously. At any step in a protocol, a temperature gradient of up to 25°C may be programmed across the reaction block.

- Gradient control provides exceptional uniformity and reproducibility within each zone
- Easy programming with onscreen presentation of gradient temperatures
- Precision ramping
- Available for both conventional and quantitative PCR instrumentation
- Each temperature within the thermal gradient is listed in validation reports

Thermal gradient. Optimizing incubation temperatures for real-time PCR assays is critical, particularly for multiplex assays, but it is not always easy to do. After the melting temperature (T_m) of a primer is calculated, the annealing temperature must be determined empirically for optimal results. This often involves repeating a reaction at many different temperatures. Similar time-consuming tests may be required to optimize the denaturation temperature. The thermal gradient feature facilitates identification of the most favorable temperatures for optimal assay performance.



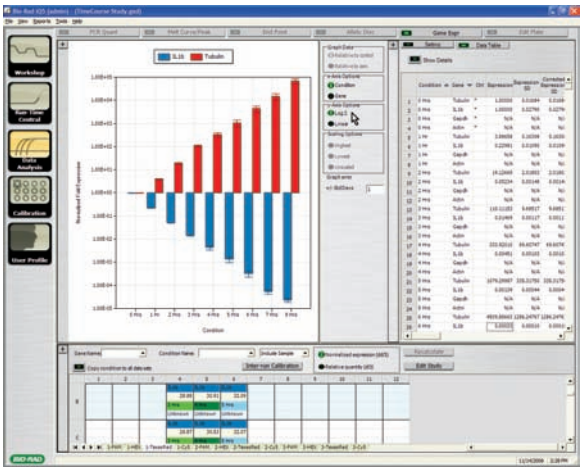
Thermal gradient experiment for optimizing annealing temperature. A 10-fold dilution series (10^8–10^2 copies) of plasmid containing GAPDH template was amplified using a thermal gradient in the presence of SYBR Green I dye. The amplification reaction was monitored and analyzed with an iQ5 real-time PCR detection system. Eight identical reactions were prepared for each template concentration, one for each of the eight PCR annealing temperatures, ranging from 55 to 70°C. An optimal primer annealing temperature of 58°C (shown in the green traces), which resulted in the earliest C_T value, was identified in this gradient assay. The blue traces show the results for 64.5°C as a comparison.

Efficient, Accurate, Easy-to-Use Software

Making the most of a powerful real-time PCR system requires a flexible and easy-to-use software package. The iQ5 optical system software meets this need with quick-setup tools, a full suite of analysis tools, and a variety of presentation options. In addition, iQ5 optical system software, Security Edition, provides the tools required to meet regulatory requirements.

Standard features of iQ5 software include:

- Advanced gene expression analysis options, including comparison to multiple reference genes, correction for reaction efficiency, and more
- Ability to export any data collected and analyzed by iQ5 software directly to a Microsoft Excel spreadsheet
- Gene Study module for multifile gene expression analysis to directly compare over 5,000 C_T values from iQ5 and MyiQ data
- User Profile management tool for creating unique user log-in names, with optional password protection, for file storage and data analysis preferences
- Built-in analysis modules for absolute quantitation, melt-curve analysis, end-point analysis, and allelic discrimination (for multiplex data)



Multifile gene expression analysis. Compare C_T values from different data files with the Gene Study in iQ5 software. Over 5,000 C_T values can be analyzed in a single Gene Study file.

Security for Those Who Need It

The Security Edition of iQ5 optical system software can integrate the power of an iQ5 real-time PCR detection system with your laboratory's good laboratory practice (GLP) standards for data collection and data analysis. This software is designed for routine use by scientists who operate in regulated environments that require electronic record-keeping procedures.

The Security Edition offers several major functions and features, including:

- Embedded tools for compliance with US FDA 21 CFR Part 11 regulations, including electronic signature and added traceability features
- Enhanced reporting tools for customizing the secure presentation of assay results

Electronic record-keeping tools. The iQ5 Security Edition software enables electronic signatures to be applied to calibration and data files generated by iQ5 or MyiQ systems.

Optimized Reagents for Peak Performance

Bio-Rad reagents accentuate the performance of your real-time system. All reagents demonstrate high performance with minimal optimization over a wide dynamic range for input RNA, cDNA, genomic DNA, and plasmid DNA.

Detect Multiple Targets Without Optimization

iQ multiplex powermix is a robust mix that greatly simplifies the challenge of identifying reaction conditions that will amplify targets with equal efficiency in singleplex and multiplex real-time PCR reactions. This mix makes multiplex real-time PCR easier by removing the need to optimize buffer, enzyme, or primer concentrations.

Convenient One-Step RT-qPCR for Any Detection Chemistry

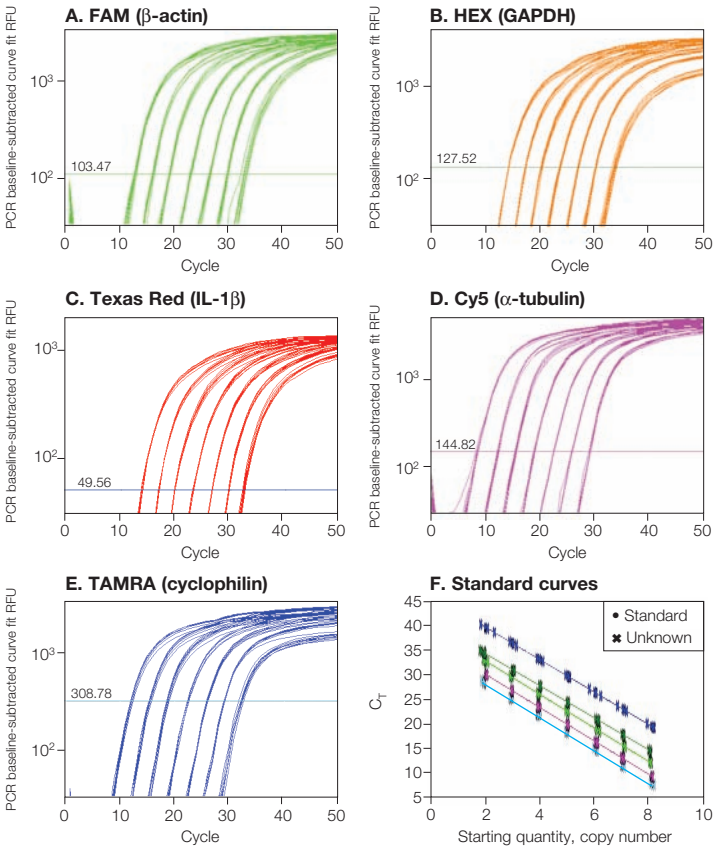
iScript™ one-step RT-PCR kits are optimized to deliver maximum RT-PCR efficiency, sensitivity, and specificity. These kits contain a proprietary reaction buffer that has been specifically formulated to optimize activity of both iScript reverse transcriptase and iTaq™ DNA polymerase, while minimizing the potential for primer-dimer formation and other nonspecific PCR artifacts. With these kits, clean detection of low-copy targets is easy to achieve.

Protect Precious Samples With High-Quality Plastic Consumables

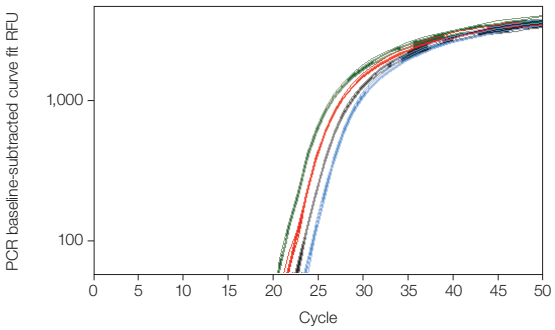
Bio-Rad offers high-quality consumables for a wide variety of applications, backed by technical support professionals.

Each box of Bio-Rad tubes, plates, and caps is process-sampled and tested to be negative for DNase, RNase, and DNA. All reaction vessels and sealing systems have been designed to provide the best possible fit and performance with a corresponding Bio-Rad thermal cycler. For real-time PCR applications, Bio-Rad offers precisely manufactured tubes, plates, sealers, and accessories that have been tested for optimal performance in iQ5 and MyiQ systems.

iQ™ SYBR® Green supermix.



Linearity of five-target multiplex detection with the iQ5 real-time PCR detection system. A–E, fluorescence data from a series of 10-fold dilutions of plasmid DNA (10^8–10^2 copies per 25 µl reaction) amplified using five reporter dyes to monitor five targets, as indicated above panels. F, standard curves generated from data in A–E: FAM, R^2 = 0.998, efficiency = 98.0%; HEX, R^2 = 0.999, efficiency = 104.4%; Texas Red, R^2 = 0.999, efficiency = 102.5%; Cy5, R^2 = 0.999, efficiency = 98.9%; TAMRA, R^2 = 0.999, efficiency = 100.8%.



An accurate one-cycle spacing between C_T values is precisely maintained in a series of 2-fold dilutions. Human genomic DNA (120–15 ng) was amplified with iQ supermix using primers and a probe specific to the IL-1β gene. Eight replicates at each template concentration were amplified along with no-template controls on the MyiQ real-time system. Standard curve had r = −0.999, slope = −3.378, efficiency = 97.7%.

System Specifications

Temperature	
Range	4–100°C
Accuracy	±0.3°C of programmed target
Uniformity	±0.4°C well-to-well
Gradient Mode	
Gradient accuracy	±0.4°C
Row uniformity	±0.4°C
Gradient range	40–100°C
Temperature differential range	1–25°C
Optical System	
Light source	Tungsten-halogen lamp
Fluorescence excitation range	
MyiQ	475–495 nm
iQ5	475–645 nm
Fluorescence detection range	
MyiQ	515–545 nm
iQ5	515–700 nm
Sensitivity	One copy of IL-1β in human genomic DNA
Dynamic range	9 orders of magnitude
Compatible dyes	
MyiQ	FAM, SYBR Green I
iQ5	FAM, SYBR Green I, HEX, TAMRA, Texas Red, Cy5
Descriptive	
Sample capacity	96 wells
Sample volume	15–100 µl
Dimensions (W x D x H)	29.2 x 58.4 x 38.7 cm (11.5 x 23 x 15.2")
Weight	17.6 kg (39 lb)

Ordering Information

Catalog #	Description
170-9770	**MyiQ Single-Color Real-Time PCR Detection System**, includes iCycler base, optics module, software CD-ROM, 96-well optical reaction module, optical-quality 96-well PCR plates, Microseal® 'B' seals, communication cables, power cords, instructions
170-9780	**iQ5 Multicolor Real-Time PCR Detection System**, includes iCycler base, optics module, software CD-ROM, 5 installed filter sets, 96-well reaction module, calibration solutions, optical-quality 96-well PCR plates, Microseal 'B' seals, communication cables, power cord, quick reference cards, instructions
170-8734	**Beacon Designer Probe/Primer Design Software**, includes CD-ROM, quick guide, instructions
170-9753SE01	**iQ5 Optical System Software**, Security Edition, single-seat license
170-9799	**Real-Time PCR Applications Guide**
223-9441	**iQ 96-Well PCR Plates**, 25
TBS-0201	**0.2 ml 8-Tube Strips Without Caps**, natural, 125
TCS-0803	**Optical Flat 8-Cap Strips**, for 0.2 ml tubes and plates, ultraclear, 120
MSB-1001	**Microseal 'B' Adhesive Seals**, 100
170-8848	**iQ Multiplex Powermix**, 50 x 50 µl reactions, 2x mix contains dNTPs (including dUTP), 11 mM $MgCl_2$, iTaq DNA polymerase, stabilizers
170-8860	**iQ Supermix**, 100 x 50 µl reactions, 2x mix contains 100 mM KCl, 40 mM Tris-HCl, pH 8.4, 0.4 mM each dNTP (dATP, dCTP, dGTP, dTTP), 50 U/ml iTaq DNA polymerase, 6 mM $MgCl_2$, stabilizers
170-8875	**iTaq DNA Polymerase**, 5 U/µl, includes 5,000 U polymerase, 25 ml of 10x PCR buffer, 25 ml of 50 mM $MgCl_2$ solution
170-8894	**iScript One-Step RT-PCR Kit for Probes**, 50 x 50 µl reactions, includes iScript reverse transcriptase for one-step RT-PCR, 2x probes RT-PCR reaction mix, nuclease-free water
732-6800	**Aurum Total RNA 96 Kit**, 2 x 96-well preps, includes 2 grow blocks, 2 growth membranes, sealing tape, 2 RNA binding plates, 2 collection microplates, 2 vials lyophilized DNase I, RNase-free reagents, protocol overview, instructions
700-7000	**Experion System**, 100–120/220–240 V, for protein analysis, includes electrophoresis station, priming station, software, USB2 cable, instructions (analysis kits sold separately)

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