



A real step forward in real-time PCR.



7900HT

Fast Real-Time PCR System

A real asset to any disease research program.

The Applied Biosystems 7900HT Fast Real-Time PCR System is the only real-time quantitative PCR system that combines 384-well plate compatibility with fully automated robotic loading—and now also offers optional Fast real-time PCR capability. Acknowledged as the gold standard in real-time PCR, the 7900HT system combined with TaqMan® Genomic Assays enables you to achieve unprecedented throughput and flexibility, allowing you to pursue projects beyond the scope of previous real-time instruments.

With powerful, researcher-friendly software, a 384-well TaqMan® Low Density Array, and Applied Biosystems convenient assay products, it's easy for labs of all sizes to realize the full potential of this powerful research tool.



The Applied Biosystems 7900HT Fast Real-Time PCR System, shown here with Automation Accessory, is engineered from the ground up to support high-throughput applications such as gene expression quantitation and SNP genotyping.

A high-performance platform for high-throughput discovery

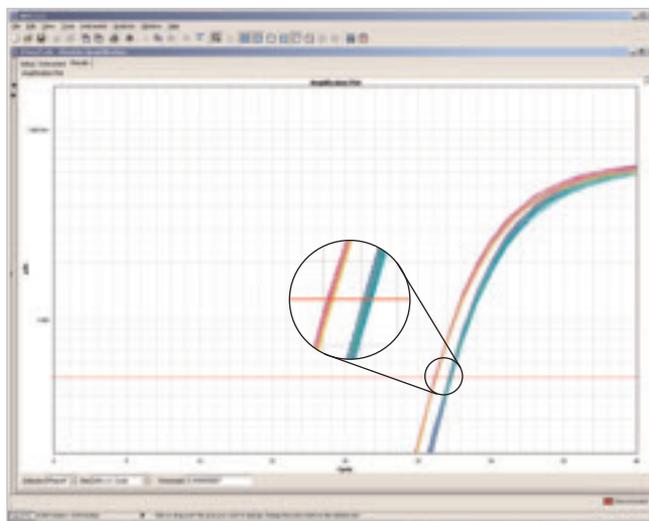
- **User-interchangeable block formats** deliver exactly the throughput and features you need—in a system that can expand and adapt to meet your future requirements.
- **Two fast PCR options** give you real-time PCR results in both the standard 96-well format (run time: ~35 minutes) or 384 wells (<55 minutes).
- **Optional Enterprise Edition Software** makes it easy for your whole organization to make the most of the system's advanced features and high-throughput capabilities. It also assists with 21CFR Part 11 requirements.
- **Choice of assay chemistries** lets you pursue a broad range of applications—with or without the use of probes.
- **Hands-free plate-loading and unloading** provides true walkaway automation allowing you to amplify your lab's productivity.

Fast, scanning-based detection

The Applied Biosystems 7900HT Fast Real-Time PCR System accommodates higher density plates without compromising speed, resolution, or robust performance. A laser scans and excites the fluorescent dyes in each of the wells; a spectrograph and charge-coupled device (CCD) camera spectrally resolves and collects the fluorescence emission from each sample.



TaqMan® Low Density Array. Streamlines reaction setup time, eliminates the need for liquid handling robotics, and provides standardization when screening selected panels of genes.



Real-time reproducibility. Amplification of the RNase P gene from human genomic DNA. Samples were run in replicates of 144 using the fluorogenic 5' nuclease assay. The system can distinguish between two samples containing 5,000 and 10,000 template copies with a confidence level of 99.7%.

Real flexibility—to match your research requirements.

The Applied Biosystems 7900HT Fast Real-Time PCR System gives you the flexibility you need to meet any real-time PCR need. Interchangeable block formats let you easily adapt for different applications. You can also take advantage of a wide range of powerful automation capabilities.

A platform you can grow with

The 7900HT system is a versatile research tool that can accommodate any real-time PCR need. User-interchangeable thermal cycling block formats let you select the format that's right for your project. You can choose from industry-standard 96- and 384-well formats, as well as a novel 384-well TaqMan® Low Density Array. Applied Biosystems also offers a Fast 96-well block that reduces run times from 2 hours to about 35 minutes, and a new Fast 384-well option that completes each run in less than 55 minutes. An automation option allows you to meet increasing throughput demands.



Flexible formats. Easily interchangeable block formats include a new Fast PCR option, standard 384-well and 96-well detection, and the TaqMan® Low Density Array block.

Choose your level of automation

The optional, integrated Automation Accessory provides maximum throughput. Up to 84 384-well plates can be loaded at a single time for unattended operation; a bar code reader allows you to insert or substitute plates into the sample queue at any time.



Automation Accessory.

Powerful software makes short work of system setup and data analysis—and the fully-automated Enterprise Edition integrates seamlessly into your company-wide high-throughput discovery operations.



TaqMan® Low Density Array

384-well TaqMan® Low Density Array saves time and reduces labor-intensive setup.

Applied Biosystems microfluidic card technology works together with TaqMan® Gene Expression Assay products help you simply and efficiently analyze tens to hundreds of targets.

The convenient, easy-to-use system streamlines the reaction setup process and requires only 24 pipetting steps to fill a 384-well card. No liquid handling robot necessary, and no worries about accuracy of small-volume deliveries. The low-volume design minimizes sample and reagent consumption, delivering more information per sample than the traditional 96-well or 384-well formats.

Fast, simple, accurate process.

The TaqMan® Low Density Array is fast and easy to use. It arrives with TaqMan® Gene Expression Assays pre-loaded and lyophilized in the wells. Simply combine your sample with TaqMan® Universal PCR Master Mix and load into the eight card ports. A short centrifugation step transfers the mixes into the individual wells of the card, which is then sealed, and loaded onto the 7900HT system for real-time analysis.

Or, choose from any of our TaqMan® Low Density Array Gene Signature Panels, pre-loaded with expert-selected TaqMan Assays. Gene Signature Panels provide TaqMan® assay-quality data without waiting for the delivery of a customized product.

For more information about TaqMan® Gene Expression Assays, please visit www.allgenes.com

Real power—to deliver world-class performance and results.

Advanced analysis capabilities and a full feature set make high-throughput gene expression and SNP genotyping research accessible to labs of all sizes.

Your choice of quantitation methods

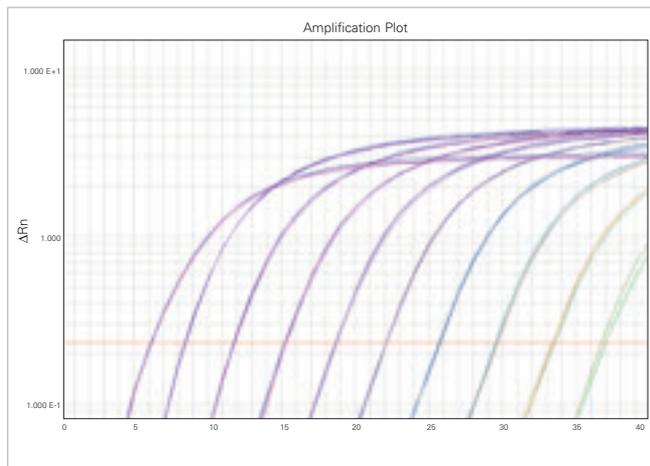
The 7900HT Fast Real-Time PCR System gives you a choice of quantitation methods for gene expression. The absolute quantitation method determines target quantity directly from a standard curve. Relative quantitation eliminates the need for a standard curve by calculating quantitation values of an unknown sample relative to a calibration sample. Either way, the software completely automates data analysis, and can automatically set the optimal baseline for each well, as well as the optimal threshold for each primer and probe set (TaqMan® assays) or assay-specific primer set (SYBR® Green Dye).

Absolute quantitation

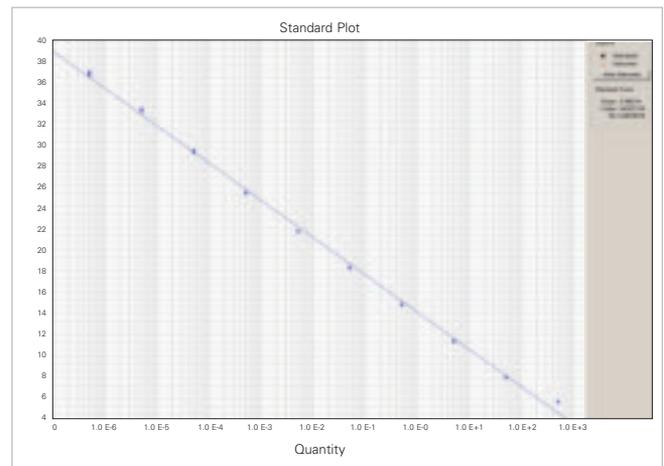
To quantitate the amount of target in unknown samples, the 7900HT system measures the sample's C_T^* and uses a standard curve to determine starting copy number. To prepare the standard curve, the 7900HT system software first calculates C_T values from dilutions of samples with known starting copy number. The software then plots the log of the starting copy number against the measured C_T value. The relationship between C_T and starting copy number is linear over at least five orders of magnitude.

** C_T , or threshold cycle, is the PCR cycle at which a statistically significant increase in reporter fluorescence can be detected above the background.*

(A) Amplification plot



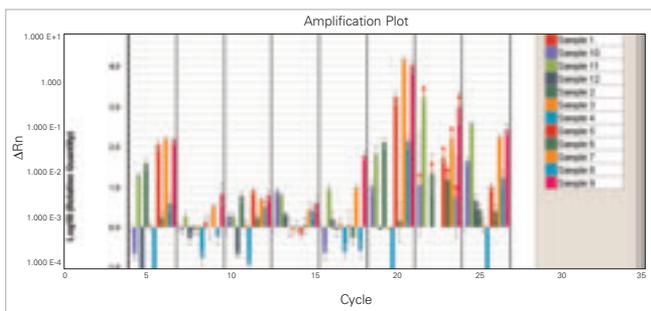
(B) Standard curve



Absolute Quantitation using the Fast 96-Well block: 9-log linearity. Amplification of the Human Eukaryotic 18S rRNA target in ten-fold dilutions from 500 nanograms to 0.5 femtograms illustrating 9 logs of linear dynamic range. (A) is an amplification plot showing the log of the change in fluorescence plotted vs. cycle number. (B) is a standard curve showing C_T values plotted vs. the log of the quantity.

Relative quantitation

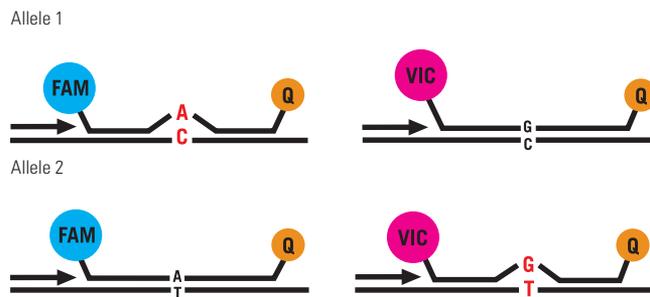
Relative quantitation is ideal for gene expression studies. Instead of using a standard curve, expression levels are calculated relative to a calibration sample—saving you time and money. An endogenous control is used to normalize the sample amount. This method, coupled with the ability of the 7900HT system to quantitate both the target and endogenous control in a multiplex reaction, enables highly cost-effective, high-throughput gene expression studies. The relative quantitation (RQ) study, which comes standard with the 7900HT system, allows simultaneous analysis of up to ten plates of data.



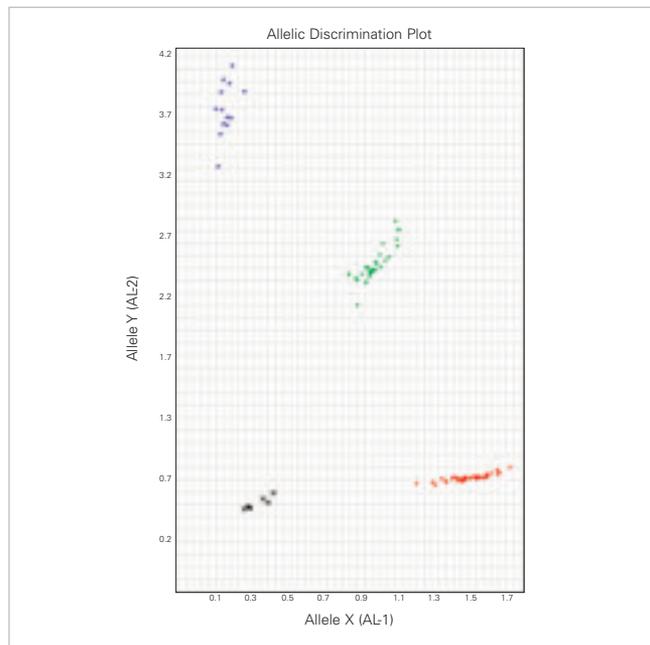
Relative Quantitation Study: 1X analysis with 10X results. Using the relative quantitation method, data analysis is completely automated, and you can view amplification plots from up to 10 plates or cards in a single analysis session, with no further downstream processing needed.

A complete system for SNP genotyping

In addition to real-time quantitation, the 7900HT system includes software for large-scale screening of known SNPs. In a two-allele system, TaqMan® probes for each allele are multiplexed in a single tube. End-point fluorescence is measured by the 7900HT system, and experimental results are rapidly generated by the integrated data analysis software.



Allelic discrimination chemistry. Allelic discrimination assay design strategy using the fluorogenic 5' nuclease assay and TaqMan MGB probes. Fluorescent signals from the FAM™ and VIC® dye-labeled probes are only generated in the presence of the complementary target sequence.



Allelic discrimination results for the CYP2C19*2 assay using the 7900HT system. New SNP genotyping functionality provides automated allele calling to accelerate data analysis and assure accurate results.

Real productivity—to get you more data, more quickly.

Walkaway operation, user-friendly system operation and sophisticated, automated workflows help you generate large volumes of data—and quickly turn all that data into answers.

High performance extends to data analysis, too

The 7900HT system extends high-throughput performance beyond sample analysis by streamlining operation and making results easy to interpret. The intuitive user interface simplifies setup and allows you to quickly analyze sample data and visualize your results for fast, effective decision-making.

Fully automated Enterprise Option

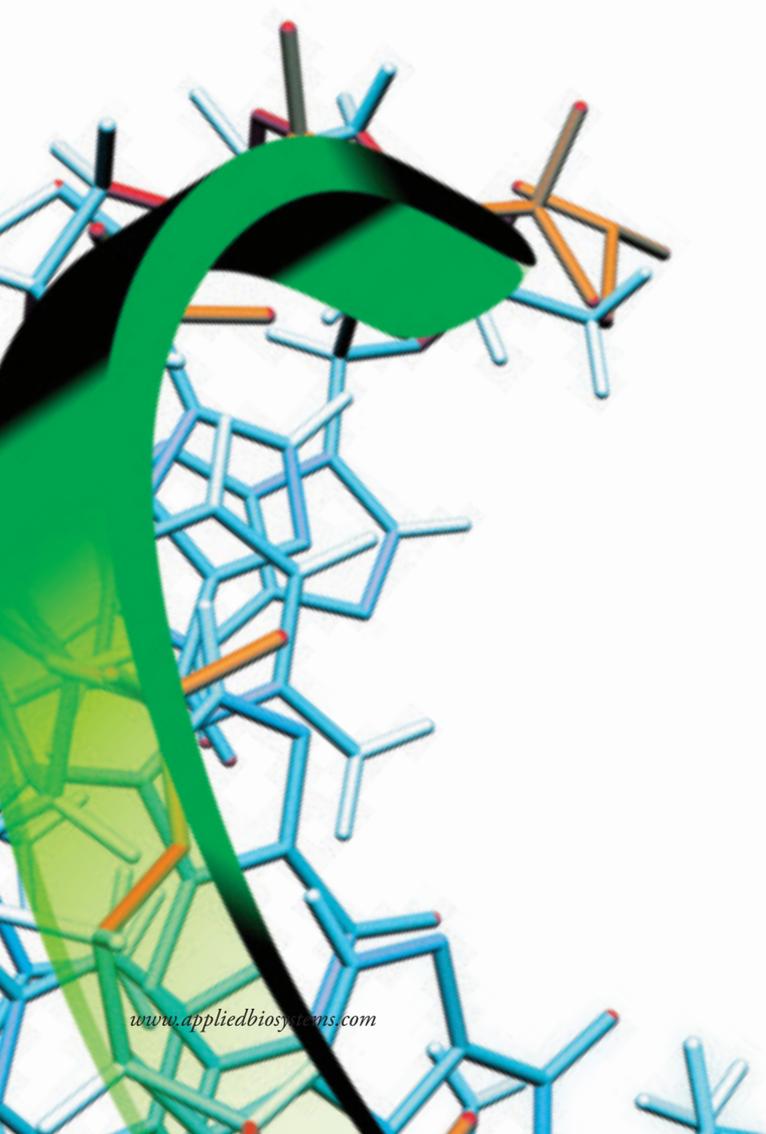
In addition to the Standard Edition Software included with the 7900HT system, you can also choose to upgrade to the optional Enterprise Edition. The Enterprise Edition Software further facilitates high-throughput automated workflows, allowing you to realize the full power of the 7900HT system. The Enterprise Edition also enables robust, scalable, and secure data management via the included Oracle® database.

Support for 21 CFR Part 11 Requirements

Enterprise Edition Software includes a suite of features to assist you with 21 CFR Part 11 requirements: data integrity, security, auditing functions, electronic signatures, and electronic record-keeping. In addition to minimizing vulnerability to signature fraud and report misfiling, these electronic procedures reduce compliance bottlenecks, and help increase the flow of vital information throughout your organization.

Application-specific analysis software

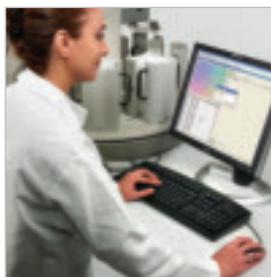
Two new analysis packages are available for use with the Enterprise Edition Software: RQ Manager (gene expression) and SNP Manager (SNP genotyping). By letting you analyze the data from hundreds (RQ Manager) to thousands (SNP Manager) of plates as a single study, these powerful software applications facilitate high-throughput data analysis. They reduce your hands-on analysis time, and simplify your data analysis workflow.



Automated Enterprise Edition workflow

When you use the Enterprise Edition Software, all plate documents are loaded into the database; automation runs proceed without further intervention as bar codes on the plates are read by the system. When the run is complete, raw data and primary analysis results are automatically saved to the database and are then available for further analysis using SNP or RQ Manager Software.

Step 1



Store plate documents in the SDS Software database.

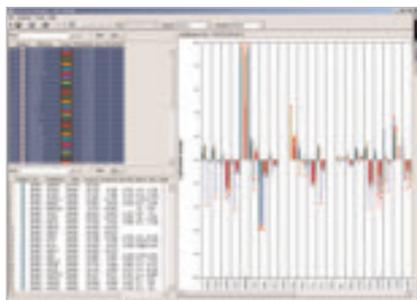
Step 2



Begin automation run. Software will then automatically:

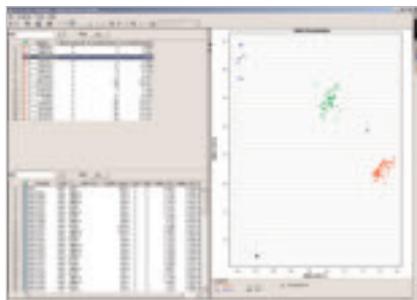
- Retrieve plate setup information for plates loaded on the Automation Accessory
- Analyze the file following each individual run
- Populate the database with the raw data and experimental results

Step 3



View results from multiple plate documents in RQ Manager or SNP Manager Software.

RQ Manager Software: Developed to meet the data demands of high-throughput gene expression studies, RQ Manager automates data analysis when using the comparative C_T method. It allows data from up to hundreds of plates/cards to be analyzed in a single session, using the same automatic baseline and threshold algorithms (Auto C_T) as SDS Standard Edition Software. Easy to learn and easy to use, application performance has been verified with up to 200 x 384-well plates—153,600 data points.



SNP Manager Software: A new analysis application for SNP genotyping, SNP Manager allows up to thousands of plates be auto-called in a single analysis, using the same automated allele calling algorithm as the Standard Edition Software. Easy-to-use, and easy-to-learn, the high-throughput package has been verified with 5,000 x 384-well plates (384 markers)—1.92 million genotypes.

Real convenience—with pre-designed assays and your choice of chemistries.

Convenient pre-designed TaqMan® Genomic Assays let you focus on your science, rather than assay development.

Accomplish more

Applied Biosystems biologically informative genomic assays are moving genetic discovery to the next level by making the world's largest collection of genomic assays available to any researcher. Based on today's most comprehensive library of public and private sequence data, these affordable, SNP and gene expression probe and primer sets eliminate the time required to design “home-brew” assays, and can significantly increase your throughput.

Simplify your workflow, increase your confidence

Alternate analysis techniques require numerous steps and manual intervention. By contrast, the 5' nuclease assay chemistry calls for already-familiar tools and requires no complicated sample preparation.

Simply pipette genomic DNA or cDNA, TaqMan® Universal PCR Master Mix or TaqMan® Fast Universal PCR Master Mix for fast cycling, and your assay probe and primer mix into microplate wells for real-time cycling or end-point analysis on the 7900HT system.

Choose from over 600,000 assays

TaqMan® Gene Expression Assays are a comprehensive collection of over 600,000 pre-designed probe and primer sets that let researchers quickly and easily perform quantitative gene expression studies on human, mouse, rat, arabidopsis and drosophila genes. Ordering is just a click away—search by gene name, gene symbol, public accession numbers, molecular function, or biological process.

Everything you need for a robust, automatable 5' nuclease assay is supplied in a single tube, optimized for product specificity, performance, and quality. You get trusted TaqMan®-based quantitation and unambiguous, high-sensitivity results, whether you're screening a few genes and samples, or a few thousand.



Reliable reagents. In addition to TaqMan® assays for gene expression and SNP genotyping, Applied Biosystems also offers a complete selection of application-proven reagents and consumables—all optimized for use with the 7900HT system.

Versatile chemistries for multiple applications

The Applied Biosystems 7900HT Fast Real-Time PCR System provides flexible dye detection. It is optimized for TaqMan® probe-based and SYBR® Green I Dye assay chemistries; however, this system also provides the features and capabilities to accommodate a wide range of other real-time chemistries.

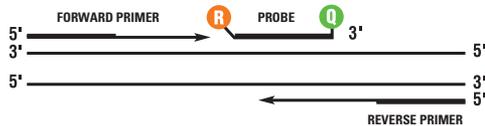
TaqMan® probe-based assay chemistry provides outstanding specificity and sensitivity, and the ability to multiplex reactions for real-time quantitation and single nucleotide polymorphism (SNP) genotyping assays. The SYBR® Green I Dye assay chemistry, while not as specific, provides an economical alternative for target identification (screening assays), or when only a small number of reactions are required for a given assay.

Simplified assay development—or no assay development at all!

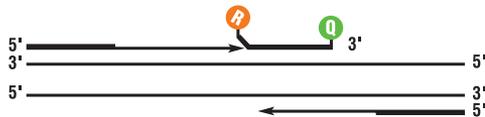
Both TaqMan® probe-based and SYBR® Green I Dye assay chemistries are supported by a comprehensive range of reagents and proven protocols that allow you to rapidly develop robust assays and eliminate assay optimization. But if you really want to save time, you can move your research ahead even faster with Applied Biosystems TaqMan® Genomic Assays. Either way, universal thermal cycling conditions allow you to combine multiple assays in a single real-time run for unmatched flexibility.

TaqMan® Probe-Based Assay Chemistry

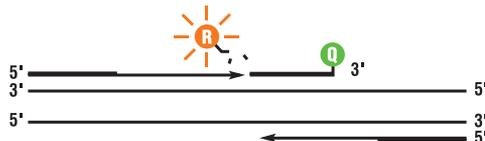
1. **Polymerization:** A fluorescent reporter (R) dye and a quencher (Q) are attached to the 5' and 3' ends of a TaqMan® probe, respectively.



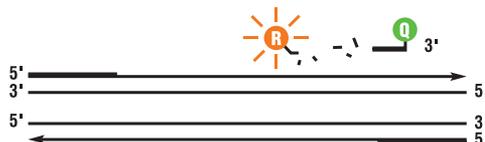
2. **Strand displacement:** When the probe is intact, the reporter dye emission is quenched.



3. **Cleavage:** During each extension cycle, the DNA polymerase cleaves the reporter dye from the probe.



4. **Polymerization completed:** Once separated from the quencher, the reporter dye emits its characteristic fluorescence.

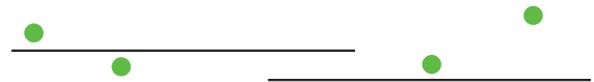


SYBR® Green I Dye Assay Chemistry

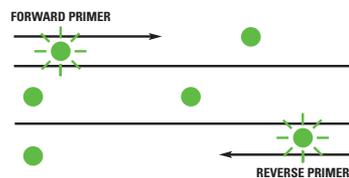
1. **Reaction setup:** The SYBR® Green I Dye fluoresces when bound to double-stranded DNA.



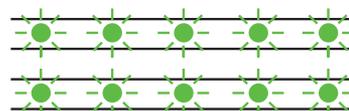
2. **Denaturation:** When the DNA is denatured, the SYBR® Green I Dye is released and the fluorescence is drastically reduced.



3. **Polymerization:** During extension, primers anneal and PCR product is generated.



4. **Polymerization completed:** When polymerization is complete, SYBR® Green I Dye binds to the double-stranded product, resulting in a net increase in fluorescence detected by the 7900HT system.



When you're successful, we're successful.

Whatever your organization's path of genetic discovery, we are committed to helping you achieve your research goals faster and more efficiently. Our mission is to deliver complete product solutions that make your gene expression studies or SNP scoring efforts more productive, and easier, too. Everything works together—instruments, software, chemistries, and ready-to-use assays—to provide the consistent, reliable results you need to advance your research to the next level.

Along with instrumentation, software, and consumables, the 7900HT system solution includes:

- Comprehensive training
- Application and assay development support
- Worldwide technical service

Discover how the 7900HT Fast Real-Time PCR System can make a real difference in your discovery program

For more information about the Applied Biosystems 7900HT Fast Real-Time PCR System—or about any of our full line of integrated products for gene expression or SNP genotyping—contact your Applied Biosystems representative or visit www.appliedbiosystems.com

For Research Use Only. Not for use in diagnostic procedures.

Practice of the patented polymerase chain reaction (PCR) process requires a license. The Applied Biosystems 7900HT Fast Real-Time PCR system base unit in combination with its immediately attached Applied Biosystems 7900HT Fast Real-Time PCR system sample block module is an Authorized Thermal Cycler for PCR and may be used with PCR licenses available from Applied Biosystems. Its use with Authorized Reagents also provides a limited PCR license in accordance with the label rights accompanying such reagents.

Purchase of this instrument does not convey any right to practice the 5' nuclease assay or any of the other real-time methods covered by patents owned by Roche or Applied Biosystems.

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