

# TaqMan® Gene Expression Assays

Providing the greatest sensitivity, specificity and reproducibility for quantitative gene expression.



# Applied Biosystems TaqMan® Gene Expression Assays Solutions

Applied Biosystems offers the largest family of products to meet your quantitative gene expression needs: from off-the-shelf gene-specific probe and primer sets to Custom TaqMan® probes and primers manufactured to your desired sequences, and everything in between. All products use TaqMan® probe-based chemistry and are designed for use on the suite of Applied Biosystems Real-Time PCR Systems—together the gold standard in quantitative gene expression offering the greatest sensitivity, specificity, reproducibility, and the broadest dynamic range.

## WHICH TAQMAN® GENE EXPRESSION PRODUCT IS RIGHT FOR YOU?

	TaqMan® Gene Expression Assays		Custom TaqMan® Gene Expression Assays	TaqMan® Endogenous Controls	Custom TaqMan® Probes and Primers
	Inventoried	Made-to-Order			
Convenience of fully-formulated assay (premixed probe and primers)	•	•	•	•	
No specific preference on assay location within a gene	•				
Specific location within a transcript is key		•	•		•
FAM™ dye label is fine	•	•	•	•	•
Need a specific reporter dye label				•	•
Prefer to use an Applied Biosystems design	•	•	•	•	
Prefer to use my own sequence target			•		•
Prefer to design my own probe and primers			•		•
Non-universal probe-primer concentration					•
For use with TaqMan® PreAmp Master Mix	•	•			

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# TaqMan® Gene Expression Assays

- Gene-specific TaqMan® probe and primer sets for quantitative gene expression studies
- Human, mouse, rat, *Arabidopsis*, *Drosophila*, *C. elegans*, Rhesus macaque, and canine species available
- Convenient single-tube format
- Universal cycling conditions

TaqMan® Gene Expression Assays are a comprehensive collection of over 700,000 pre-designed probe and primer sets that enable researchers to quickly and easily perform quantitative gene expression studies on human, mouse, rat, *Arabidopsis*, *Drosophila*, *C. elegans*, Rhesus macaque, or canine genes. Each gene expression assay consists of a FAM™ dye-labeled TaqMan® MGB probe and two PCR primers formulated into a single tube. Every assay is optimized to run under universal thermal cycling conditions with a final reaction concentration of 250 nM for the probe and 900 nM for each primer. This streamlined approach and comprehensive assay selection enables a convenient, standardized process for quantitative gene expression.

## Human Assays

Over 200,000 gene expression assays are available for all known human genes. These include genes in the public domain with associated RefSeq transcripts (NCBI Reference Sequence project database: <http://www.ncbi.nlm.nih.gov/RefSeq>), the mammalian gene collection (MGC), and GenBank® database. A minimum of one assay (probe and primer set) per RefSeq transcript is available as an inventoried, off-the-shelf product currently numbering >24,000 assays. The complete collection includes assays for nearly every exon junction in all known human genes, both in the public domain and the Celera database, covering every probe on the Applied Biosystems Expression Array System.

## Mouse and Rat Assays

Over 300,000 mouse and rat assays have been designed for all known genes. As with our human assays, at least one assay per RefSeq transcript has been manufactured and is available from our inventory. High quality assay designs for all other genes are also available on a made-to-order basis, as Custom TaqMan® Gene Expression Assays.

## Strain-Neutral Mouse and Rat Assays

The assay design process yields strain-neutral mouse and rat gene expression assays. Polymorphisms are the cause of most sequence variability between strains. By avoiding areas in the gene transcripts of known polymorphisms, we design only strain-neutral gene expression assays.

## TaqMan® Gene Copy Number Assays

TaqMan Gene Copy Number Assays are now available to detect gene copy number. Copy number is an important polymorphism in the human genome associated with genetic diseases such as cancer, immune diseases, and neurological disorders. Drug metabolizing enzymes were selected as the first set of TaqMan Gene Copy Number Assays due to their significance in human physiology and disease. Gene Copy Assays were designed to detect CYP2D6, CYP2A6, CYP2E1, GSTT1, and GSTM1.

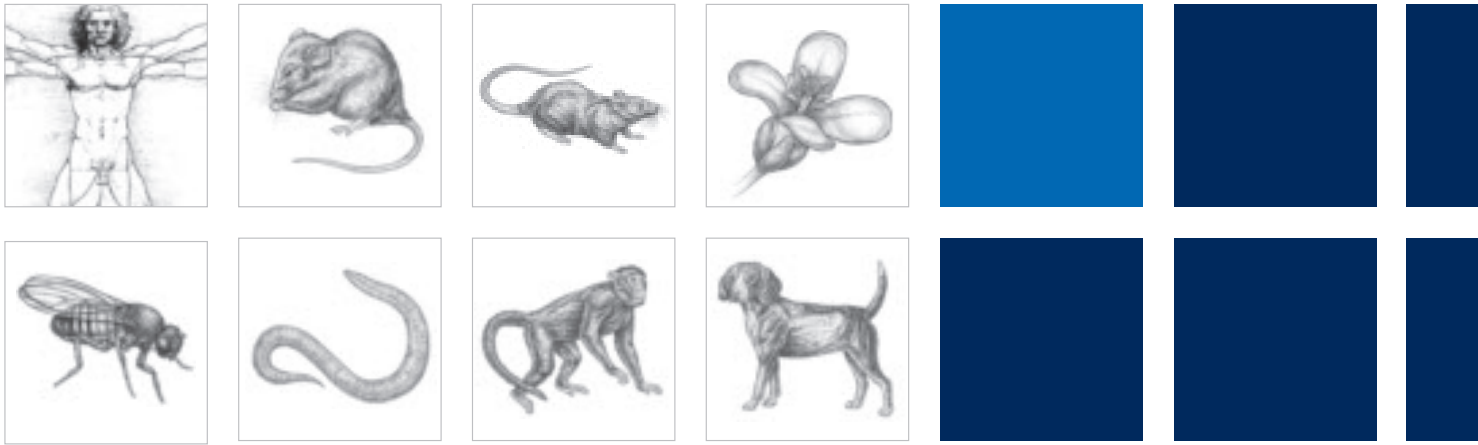
## TaqMan Gene Expression Assays for Mitochondrial DNA Transcripts

TaqMan® Assays are also available for 19 mitochondrial (mt) DNA encoded transcripts, including 13 mt mRNAs, two mt rRNAs and one mt D-loop. Three additional assays targeting the mt inter-tRNA region are available as Custom TaqMan Gene Expression Assays. Our TaqMan Assays targeting mtDNA transcripts are ideal for sensitive, specific, and accurate quantification of mtDNA transcription.

Like all TaqMan Gene Expression Assays, measurements are made in real-time, use universal cycling conditions and TaqMan® Universal PCR Master Mix.

## Comprehensive Coverage and Selection

Not only have we designed an assay for every gene, but also for multiple locations across each gene transcript. More than 700,000 high-quality assay designs are available for



human, mouse, rat, *Arabidopsis*, *Drosophila*, *C. elegans*, and canine genes on a made-to-order basis. This vast selection allows researchers to select the specific location on a given transcript they wish to detect. For instance, microarray researchers that may prefer a 3' bias in their TaqMan® probe and primer sets will be able to select from robust, pre-designed TaqMan Gene Expression Assays. Additionally, researchers performing RNAi studies can choose multiple assays per gene to validate their knockdown results.

#### State-of-the-Art Assay Design Bioinformatics

All assays are designed using Applied Biosystems sophisticated bioinformatics pipeline, customized for either the human, mouse, or rat genome. This pipeline consists of three main steps:

**Step One**—Both public and Celera sequence data are used to identify the optimal probe and primer locations. This process consists of:

- Mapping transcripts to the genome to identify exon boundaries
- Masking sequence discrepancies between public and Celera data
- Masking sequence repeats
- Masking known SNPs from both public and Celera databases

**Step Two**—Proprietary software algorithms generate probe and primer designs for the locations identified above. These algorithms include optimal design parameters, such as %GC content,  $T_m$ , amplicon length, and low secondary structure to ensure high amplification efficiency. Where possible, designs span an exon-exon junction, eliminating the possibility of detecting genomic DNA.

**Step Three**—*In silico* QC ensures each assay is specific to the gene for which it was designed (i.e., the assay will not detect sequences from other genes, or pseudo-genes). Each assay design is processed through a quality scoring system and one high scoring, gene-specific assay design is sent to our state-of-the-art manufacturing facility. All designs meeting our scoring criteria are also displayed in our online catalog and are available on a made-to-order basis. Our graphical map viewer shows each assay's location on the gene to help determine which assay is most appropriate.

#### Choice of Delivery Formats

Applied Biosystems delivers the assays in either a tube-format or TaqMan® Low Density Array-format (using inventoried assays only). The TaqMan® Low Density Array is a 384-well micro fluidic card that streamlines reaction set-up time, eliminates the need for liquid-handling robotics, and provides standardization across multiple users and/or multiple labs. This format is ideal for analyzing many samples across a fixed number of targets, such as for biomarker screening. TaqMan® Arrays arrive ready to use, with your selected TaqMan Gene Expression Assays pre-loaded into each of the 384 reaction wells. Simply add 100  $\mu$ L sample mix (sample cDNA and TaqMan Universal PCR Master Mix) to each of the eight sample ports and run on an Applied Biosystems 7900HT Fast Real-Time PCR System. For more information, see the "TaqMan Low Density Array" section on page 9.

For more information on this product, visit [www.allgenes.com](http://www.allgenes.com)

**TaqMan® Gene Expression Assays**

Click a tab below to learn more about TaqMan Gene Expression Assays. To find and order assays, click the Search tab.

Ordering Information | **Assay Search** | Product Description | Technical Specifications | Literature/Resources | Related Products

Your search for "BRCA1 in All Tissues" returned 297 results. (Species: ALL, Amplicon Length: ALL, Set Membership: ALL) If you wish to refine your search results by product availability, click a radio button below, and then click Filter Results. To filter your results by other criteria, select from the categories list to the left of your results. [Search Help](#)

[Search Again](#) Previous | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Next

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**View Results by Category**

**Filter Results by availability**

Inventoried Assays  Made to order Assays  Inventoried and Made to order Assays [Filter Results](#)

20202554\_10/17/2006 15:08:3 [Add to Basket](#) [Save to Workspace](#) [Export Results](#) 25 items/page

	Assay ID	Availability	Gene Symbol	Gene Name	Alias	RefSeq	GenBank mRNA	Probe ID	Amplicon Length
<input type="checkbox"/>	1. <a href="#">Assay ID Details: Hu01556193_m1</a> <a href="#">Annotation Details: Map Viewer</a> <a href="#">Ambion Catalog: View / Order Ambion siRNAs</a>	Made to Order	BRCA1	breast cancer 1, early onset	BRCA1; HNRN1100; DRIS; PSCP; RNF53	13 RefSeqs	6 GenBank mRNAs	124112	59
			NC016943	Gene: NC016943 Celera Annotation					
<input type="checkbox"/>	2. <a href="#">Assay ID Details: Hu01556194_m1</a> <a href="#">Annotation Details: Map Viewer</a> <a href="#">Ambion Catalog: View / Order Ambion siRNAs</a>	Made to Order	BRCA1	breast cancer 1, early onset	BRCA1; HNRN1100; DRIS; PSCP; RNF53	12 RefSeqs	7 GenBank mRNAs		273
			NC016943	Gene: NC016943 Celera Annotation					
<input type="checkbox"/>	3. <a href="#">Assay ID Details: Hu01556190_m1</a> <a href="#">Annotation Details: Map Viewer</a> <a href="#">Ambion Catalog: View / Order Ambion siRNAs</a>	Made to Order	BRCA1	breast cancer 1, early onset	BRCA1; HNRN1100; DRIS; PSCP; RNF53	13 RefSeqs	6 GenBank mRNAs		70
			NC016943	Gene: NC016943 Celera Annotation					
<input type="checkbox"/>	4. <a href="#">Assay ID Details: Hu00173233_m1</a> <a href="#">Annotation Details: Map Viewer</a> <a href="#">Ambion Catalog: View / Order</a>	Inventoried	BRCA1	breast cancer 1, early onset	BRCA1; HNRN1100; DRIS; PSCP; RNF53	13 RefSeqs	6 GenBank mRNAs		69
			NC016943	Gene: ...					

[Give Us Your Feedback](#)

The Applied Biosystems online catalog makes it easy to find the optimal TaqMan® Gene Expression Assay for your research needs.

### Convenient Assay Ordering Options

Our online catalog ([www.allgenes.com](http://www.allgenes.com)) enables searching for your target of interest by:

- Gene name or gene symbol
- Accession number (NCBI RefSeq ID number, etc.)
- Species (kinase, transcription factor, ion channel, cytokine, etc.)
- Target class, location on transcript, and amplicon size

# Custom TaqMan® Gene Expression Assays

- Any species or organism
- Target sequence of your choice
- Convenient single-tube format
- Available in small, medium, and large scales



Custom TaqMan® Gene Expression Assays are delivered ready-to-use, along with the probe and primer sequences you designed.

Custom TaqMan® Gene Expression Assays are available for any species, any splice variant, or any novel gene. Simply download our free File Builder Software to format and submit your target sequence. File Builder Software can be downloaded at [www.appliedbiosystems.com/filebuilder](http://www.appliedbiosystems.com/filebuilder). The software easily guides you through the ordering process of selecting the assay size, formatting your target sequence to identify the location of the probe, and submitting your order via e-mail.

File submissions are done in a secure format. Your target sequences and the associated assays that are designed are kept confidential. With Custom TaqMan Gene Expression Assays, you benefit from Applied Biosystems proprietary software algorithms for probe and primer design, which enable you to obtain optimal assays for each target sequence. Assays are delivered in a single-tube, ready-to-use format, along with the probe and primer sequences designed from your submitted sequence.

## Automation-Compatible to Accelerate High-Throughput Applications

Both TaqMan® Gene Expression Assays and Custom TaqMan Gene Expression Assays come pre-formulated in a single, 2D-barcoded tube with an easy-to-read label. The single-tube format requires fewer set-up and pipetting steps to assemble reactions, assisting you to easily scale your throughput. Assay tubes are shipped in a 1D-barcoded 96-position rack designed to accommodate standard liquid-handling robotics and fit seamlessly into automated, high-throughput laboratory processes. Each order of assays also includes a compact disc with an assay information file that includes the assay ID numbers, detector names, reporter dye, and quencher information for easy uploading into a LIMS or sequence detection system software.

## A Simple, Standardized Solution for Quantitative Gene Expression

TaqMan Gene Expression Assays and Custom TaqMan Gene Expression Assays are built on our 5' nuclease chemistry and consist of a FAM™ dye-labeled TaqMan® MGB probe (250 nM, final concentration), and two unlabeled PCR primers (900 nM each, final concentration). All components are QC tested and formulated into a single 20X mix. Designed to run under universal conditions for two-step RT-PCR, TaqMan Gene Expression Assays are simple to use. Just add TaqMan® Universal PCR Master Mix (with or without AmpErase® UNG) and your cDNA sample to generate sensitive, reproducible, and truly quantitative gene expression data on any Applied Biosystems Real-Time PCR System.

Compared to do-it-yourself methods, TaqMan Gene Expression Assays and Custom TaqMan Gene Expression Assays eliminate weeks or even months of probe and primer design, formulation, and testing.

For more information on this product, visit [www.allgenes.com](http://www.allgenes.com) or check with your local Applied Biosystems representative.

# TaqMan® Endogenous Controls

- Optimized, pre-formulated, ready-to-use control assays
- Cost-effective gene expression quantitation in human, mouse, rat, and eukaryotes (18S rRNA)
- Choice of FAM™ or VIC® dye labels

Applied Biosystems TaqMan® Endogenous Controls are a collection of pre-designed probe and primer sets that can be used to normalize the amount of sample RNA or DNA added to a reaction. For the quantitation of gene expression, deciding upon a specific control can be difficult, even when detailed information about the biological system is available. This can result in trial and error to identify an appropriate control, leading to project delays and increased costs. Applied Biosystems offers endogenous controls for the most commonly used control genes in human, mouse, rat, and any eukaryotic (18S rRNA) species. The assays are designed to help researchers quickly and easily identify and run the best possible endogenous control for their gene expression study.

## A Simple, Standardized Solution for Quantitative Gene Expression

Each endogenous control is built on our 5' nuclease chemistry and is offered in a choice of two different reporter dyes and two quenchers:

- A FAM™ dye-labeled TaqMan® MGB probe (250 nM, final concentration) and two unlabeled PCR primers (900 nM each)
- A VIC® dye-labeled TaqMan MGB probe (250 nM, final concentration) and two unlabeled PCR primers (150 nM each—primer limited)
- A VIC dye-labeled TAMRA™ dye-labeled probe (250 nM, final concentration) and two unlabeled PCR primers (150 nM each—primer limited)

All components are QC tested, formulated into a single 20X mix, and functionally tested. Designed to run under universal conditions for two-step RT-PCR, our TaqMan Endogenous Controls are simple to use. Just add TaqMan® Universal PCR Master Mix (with or without AmpErase® UNG) and your cDNA sample to generate sensitive, reproducible, and truly quantitative gene expression data on ABI PRISM® 7000 and 7700 Sequence Detection Systems, Applied Biosystems 7300 and 7500 Real-Time PCR Systems, and Applied Biosystems 7500 and 7900HT Fast Real-Time PCR Systems. Compared to do-it-yourself methods, our TaqMan Endogenous Controls deliver a complete quantitation solution and eliminate weeks or even months of assay design, formulation, and testing.

## Choosing the Right Endogenous Control

Endogenous controls can normalize the expression levels of target genes by correcting differences in the amount of cDNA that is loaded into PCR reaction wells. For best results, verify that the endogenous control is consistently expressed in the sample set to be tested. Endogenous control expression must be uniform across all samples in the study. For multiplexing, ensure that the gene expression level of the endogenous control is greater than that of the target.

## Multiplex vs. Singleplex PCR

All TaqMan Endogenous Controls that contain probes labeled with the VIC reporter dye are primer limited. This allows multiplexing of TaqMan Endogenous Controls with target gene expression assays, provided that the control gene is more abundantly expressed than the target gene. All TaqMan Endogenous Controls that contain probes labeled with the FAM reporter dye are not primer limited and are not intended for multiplexing.

## Complementary Products

TaqMan Endogenous Controls are intended to be used with:

- TaqMan® Gene Expression Assays
- Custom TaqMan® Gene Expression Assays
- TaqMan® Pre-Developed Assay Reagents (PDARs)
- Custom TaqMan® Probes and Primers

## Online Ordering

Order from our line of TaqMan Endogenous Controls, and get more product information at [www.allgenes.com](http://www.allgenes.com), or check with your local sales representative.



# TaqMan® Endogenous Controls

	Dye/Quencher	Primer Limited	Concentration	Number of Reactions, 20 µL	Part Number
Eukaryotic 18S rRNA	VIC®/MGB	Y	20X	2,500	4319413E
	VIC/TAMRA™	Y	20X	2,500	4310893E
	FAM™/MGB	N	20X	125	4333760T
	FAM/MGB	N	20X	500	4333760F
Human ACTB (beta actin)	VIC/MGB	Y	20X	2,500	4326315E
	VIC/TAMRA	Y	20X	2,500	4310881E
	FAM/MGB	N	20X	125	4333762T
	FAM/MGB	N	20X	500	4333762F
Human B2M (beta-2-microglobulin)	VIC/MGB	Y	20X	2,500	4326319E
	VIC/TAMRA	Y	20X	2,500	4310886E
	FAM/MGB	N	20X	125	4333766T
	FAM/MGB	N	20X	500	4333766F
Human GAPD (GAPDH)	VIC/MGB	Y	20X	2,500	4326317E
	VIC/TAMRA	Y	20X	2,500	4310884E
	FAM/MGB	N	20X	125	4333764T
	FAM/MGB	N	20X	500	4333764F
Human GUSB (beta glucuronidase)	VIC/MGB	Y	20X	2,500	4326320E
	VIC/TAMRA	Y	20X	2,500	4310888E
	FAM/MGB	N	20X	125	4333767T
	FAM/MGB	N	20X	500	4333767F
Human HPRT1	VIC/MGB	Y	20X	2,500	4326321E
	VIC/TAMRA	Y	20X	2,500	4310890E
	FAM/MGB	N	20X	125	4333768T
	FAM/MGB	N	20X	500	4333768F
Human PGK1 (phosphoglyceratekinase 1)	VIC/MGB	Y	20X	2,500	4326318E
	VIC/TAMRA	Y	20X	2,500	4310885E
	FAM/MGB	N	20X	125	4333765T
	FAM/MGB	N	20X	500	4333765F
Human PPIA (cyclophilin A)	VIC/MGB	Y	20X	2,500	4326316E
	VIC/TAMRA	Y	20X	2,500	4310883E
	FAM/MGB	N	20X	125	4333763T
	FAM/MGB	N	20X	500	4333763F
Human RPL0 (large ribosomal protein)	VIC/MGB	Y	20X	2,500	4326314E
	VIC/TAMRA	Y	20X	2,500	4310879E
	FAM/MGB	N	20X	125	4333761T
	FAM/MGB	N	20X	500	4333761F
Human TBP (TATA-box binding protein)	VIC/MGB	Y	20X	2,500	4326322E
	VIC/TAMRA	Y	20X	2,500	4310891E
	FAM/MGB	N	20X	125	4333769T
	FAM/MGB	N	20X	500	4333769F
Human TFRC (CD71) (transferring receptor)	VIC/MGB	Y	20X	2,500	4326323E
	VIC/TAMRA	Y	20X	2,500	4310892E
	FAM/MGB	N	20X	125	4333770T
	FAM/MGB	N	20X	500	4333770F
Mouse GAPD (GAPDH)	VIC/MGB	Y	20X	2,500	4352339E
Mouse ACTB (beta actin)	VIC/MGB	Y	20X	2,500	4352341E
Rat GAPD (GAPDH)	VIC/MGB	Y	20X	2,500	4352338E
Rat ACTB (beta actin)	VIC/MGB	Y	20X	2,500	4352340E

# TaqMan® Low Density Array

- Validate microarray hits quickly and economically
- Standardize screening of gene panels across many samples and laboratories
- Create the perfect card by designing a custom array that meets your specific need
- Load 384 wells in less than five minutes without robotics or multi-channel pipettors



The TaqMan® Low Density Array is a 384-well micro fluidic card that enables you to perform 384 simultaneous real-time PCR reactions without the need for liquid-handling robots or multi-channel pipettors to load samples. This low- to medium-throughput array enables 1 to 8 samples to be run in parallel against 12 to 384 TaqMan® Gene Expression Assay targets that are pre-loaded into each of the wells in the array. The TaqMan Low Density Array is completely customizable—choose from over 47,000 inventoried TaqMan Gene Expression Assays designed for human, mouse, and rat genes to have loaded into a TaqMan® Array. The TaqMan Array is designed for use on the flexible Applied Biosystems 7900HT Fast Real-Time PCR System with a 7900HT TaqMan® Array Upgrade.

## The Ultimate Microarray Validation Tool

TaqMan Arrays are exactly the right tool for validating the tens or hundreds of hits that come from microarrays because they can be customized to include up to 384 of those hits in one easy-to-use card. Using individual assays, or even SYBR®-based assays, to look at 12, 48, or 96 targets can quickly become unmanageable and expensive. TaqMan Low Density Arrays enable researchers to accomplish the validation necessary to arrive at the right answer easily and affordably.

## Ideal Screening Technology

TaqMan Low Density Arrays are ideal for screening biomarkers and toxicology panels, and for analyzing pathways, target classes, and complete disease sets. Because TaqMan Arrays don't require liquid-handling robotics for loading, you get

standardized results with low variability across many users and laboratories. Plus, TaqMan Gene Expression Assays—the benchmark of specificity and sensitivity in real-time PCR—are pre-loaded into the TaqMan Array, ensuring reliable performance and results you can trust.

## Create the Perfect Card

You select TaqMan Gene Expression Assays and the optimal TaqMan Array format for your experiment, and we deliver TaqMan Low Density Arrays pre-loaded with your selected assays in each reaction well. Choose 12 to 384 target assays from our collection of inventoried TaqMan Gene Expression Assays covering human, mouse, and rat genes. Ordering is easy with the new online TaqMan Low Density Array configuration tool to help you search and select genes and assays. Custom TaqMan Arrays are available in nine different formats, covering 12, 16, 24, 32, 48, 64, 96 (2 choices), and 384 assays per Low Density Array.

## Designing a TaqMan Low Density Array

Customizing a TaqMan Low Density Array can be done through the Applied Biosystems Web site. Choose your ideal format and TaqMan Gene Expression Assays, select a quantity, and place your order—it's as easy as 1, 2, 3. Or, download our list of customizable gene panels to define a particular target class or pathway using public databases and published articles. The gene lists include a TaqMan Gene Expression Assay to represent each gene in the list that can be used to configure a custom TaqMan Array.

**TaqMan® Low Density Array (384-well micro fluidic card)**

Description	# of Assays	# of Samples per Card				Minumum Order Quantities	Part Number
		1 Replicate	2 Replicates	3 Replicates	4 Replicates		
Format 12	11 + 1 control				8	20	4342247
Format 16	15 + 1 control			8		20	4346798
Format 24	23 + 1 control		8		4	20	4342249
Format 32	31 + 1 control			4		20	4346799
Format 48	47 + 1 control		4		2	10	4342253
Format 64	63 + 1 control			2		20	4346800
Format 96a	95 + 1 control		2		1	10	4342259
Format 96b	95 + 1 control		2		1	20	4342261
Format 384	380 + 1 control	1				50	4342265
<b>7900HT TaqMan® Low Density Array Upgrade*</b>							4329012
Includes: sample block, micro fluidic card sealer, custom buckets and adaptors, <i>Getting Started</i> guide, and chemical installation kit.							

\* A compatible centrifuge is required but not supplied. Ask your local sales representative for a list of compatible centrifuge and rotor options.

## TaqMan® Low Density Array Gene Signature Panels

- Pre-formatted and inventoried for quick delivery
- Economical two- or four-card packages simplifies your workflow
- TaqMan Gene Expression Assay performance without expensive robotics
- Consistent, reliable data across samples, studies, and labs

TaqMan® Gene Signature Panels are pre-designed, focused gene panels for many important target classes and pathways. Gene sets in each panel have been culled from pathway analysis tools, published review papers, and collaborator and customer input. Select from a variety of TaqMan Gene Signature Panels based on your research needs covering such areas as GPCRs, immune response, or protein kinases. Endogenous Control Panels are also available to assess which housekeeping genes are best for your specific study. TaqMan Gene Signature Panels provide faster delivery times than our custom TaqMan Arrays because they are already inventoried. TaqMan Gene Signature Panels are packaged in two or four cards per pack, making them more cost effective.

See page 20 for a list of TaqMan Low Density Array Gene Signature Panel part numbers. To view our ever-expanding menu of Gene Signature Panels, visit [tlda.appliedbiosystems.com](http://tlda.appliedbiosystems.com)

# TaqMan® Low Density Array

TaqMan® Arrays can be ordered in any of these nine format options.

## Format 12 (P/N 4342247)

11 unique assays + 1 mandatory control  
8 unique samples

Replicates	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	Port
1	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	A 1
2	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	B 2
3	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	C 3
4	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	D 4
5	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	E 5
6	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	F 6
7	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	G 7
8	1	1	2	2	3	3	4	4	5	5	CTL	CTL	6	6	7	7	8	8	9	9	10	10	11	11	H 8

## Format 16 (P/N 4346798)

15 unique assays + 1 mandatory control  
8 unique samples

Replicates	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	Port
1	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	A 1
2	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	B 2
3	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	C 3
4	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	D 4
5	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	E 5
6	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	F 6
7	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	G 7
8	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	H 8

## Format 24 (P/N 4342249)

23 unique assays + 1 mandatory control  
8 unique samples

Replicates	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	Port
1	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	A 1
2	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	B 2
3	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	C 3
4	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	D 4
5	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	E 5
6	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	F 6
7	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	G 7
8	1	2	3	4	5	6	7	8	9	10	CTL	11	12	13	14	15	16	17	18	19	20	21	22	23	H 8

## Format 32 (P/N 4346799)

31 unique assays + 1 mandatory control  
4 unique samples

Replicates	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	Port
1	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	A 1
2	16	16	16	17	17	17	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	23	B 2
3	24	24	24	25	25	25	26	26	26	27	27	27	28	28	28	29	29	29	30	30	30	31	31	31	C 3
4	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	D 4
5	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	E 5
6	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	F 6
7	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	G 7
8	1	1	1	2	2	2	3	3	3	CTL	CTL	CTL	4	4	4	5	5	5	6	6	6	7	7	7	H 8



# Custom TaqMan® Probes and Primers

- Choice of dye labels, quenchers, and synthesis scales
- Available for any species or organism
- For use in quantitative gene expression, SNP genotyping, other allelic discrimination applications, and pathogen detection

When you know the exact sequences you need for your TaqMan® probes and primers, Applied Biosystems can synthesize them for you. As the market leader in real-time PCR, our high-quality custom products can be used in all of your real-time and end-point PCR applications. These products offer you the ideal in flexibility, whether you prefer to optimize your own reaction formulation, or if you simply require large quantities.

Our Custom TaqMan® Probes and Primers are manufactured at three sites around the world—the United States, the United Kingdom, and Japan—to provide excellent delivery time. Order by fax, e-mail, or online and send your sequences to our synthesizers electronically, reducing delivery time.

## Choice of Quenchers

Applied Biosystems Custom TaqMan® Probes incorporate a 5' reporter dye and a 3' quencher. Our most popular quencher is a non-fluorescent quencher (NFQ) combined with an MGB (minor groove binder) moiety. The NFQ offers the advantage of lower background signal, which results in better precision in quantitation. The MGB moiety stabilizes the hybridized probe and effectively raises the melting temperature ( $T_m$ ). This means that MGB probes can be shorter than traditional dual-labeled probes, which make them better suited for allelic discrimination applications. The shorter probe lengths mean that single base mismatches (e.g., SNPs) will have a greater destabilizing effect on an MGB probe, resulting in better discrimination. The shorter length also offers greater design flexibility for all real-time PCR applications.

Applied Biosystems offers the traditional dual-labeled Custom TaqMan Probes with a TAMRA™ dye fluorescent quencher as well. All TAMRA dye TaqMan probes are HPLC purified.

## A Selection of Reporter Dyes

Applied Biosystems Custom TaqMan Probes can be ordered with a variety of different reporter dyes to facilitate your multiplexing applications.

## Synthesis Scales

TaqMan Custom Probes and Primers are available in a choice of three standard sizes. Each includes a pre-defined quantity of probe or primer to ensure that you get the same amount each time you order and aren't subject to variations in synthesis yield. For larger synthesis scales on these products, please contact your local Applied Biosystems Sales Representative.

## Primer Express® Design Software

Applied Biosystems Primer Express® software is available to simplify the probe and primer design process. Primer Express is available for individual users and in multi-user packs. Please check our Web site at [www.appliedbiosystems.com](http://www.appliedbiosystems.com) for more details. If you prefer the convenience of a pre-designed probe and primer set, please check our vast selection of TaqMan® Gene Expression and SNP Genotyping Assays.

## Other Fluorescent Dye-Labeled Oligos

Applied Biosystems also offers a host of other custom oligo products for use in many applications, including microsatellite-based linkage mapping, mutation detection, and more.

For more details, visit [www.appliedbiosystems.com](http://www.appliedbiosystems.com)

### CUSTOM TAQMAN® PROBES AND PRIMERS

Probe Type (3' Quencher)	Reporter Dye (5') Label	Quantity	Probe Length	Part Number
TaqMan® TAMRA™ Dye Probes	6-FAM™, VIC®, or TET™	6,000 pmol	Up to 35 bases	450025
	6-FAM, VIC, or TET	20,000 pmol	Up to 35 bases	450024
	6-FAM, VIC, or TET	50,000 pmol	Up to 35 bases	450003
TaqMan® MGB Probes	6-FAM, VIC, TET, or NED™*	6,000 pmol	13–25 bases	4316034
	6-FAM, VIC, TET, or NED*	20,000 pmol	13–25 bases	4316033
	6-FAM, VIC, TET, or NED*	50,000 pmol	13–25 bases	4316032
Real-Time PCR Primers (sequence detection primers)	N/A	10,000 pmol	N/A	4304970
	N/A	80,000 pmol	N/A	4304971
	N/A	130,000 pmol	N/A	4304972

\* Please note that NED dye can give lower signal intensity than FAM, VIC, or TET dye on most Real-Time PCR Systems. The Applied Biosystems 7500 Real-Time PCR System has been optimized to yield higher signal intensity for NED dye.

# TaqMan® MicroRNA Assays

- Highly specific—quantitate only the biologically active mature miRNAs
- Sensitive—conserves limited samples; requires only 1-10 *nanograms* of total RNA or equivalent
- Wide dynamic range—up to seven logs—detect high and low expressors in a single experiment
- Fast, simple, and scalable—two-step qRT-PCR assay provides high-quality results in less than three hours
- Broad coverage—choose from human, mouse, rat, *Arabidopsis*, *C. elegans*, and *Drosophila* genes

By making novel adaptation in assay design, Applied Biosystems is able to bring our gold standard specificity, sensitivity, and simplicity of TaqMan® Assays and real-time PCR to miRNA detection and quantitation.

The basis of TaqMan® MicroRNA Assays is a target-specific stem-loop structure, reverse-transcriptase primer. Its innovative design overcomes a fundamental problem in miRNA quantitation: the short length of mature miRNAs (~22 nt) prohibits conventional design of a random-primed RT step followed by a specific real-time assay. The stem-loop accomplishes two goals: 1) specificity for only the mature miRNA target, and 2) formation of a RT primer/mature miRNA-chimera, extending the 5' end of the miRNA. The resulting longer RT amplicon presents a template amenable to standard real-time PCR, using TaqMan Assays.

To ensure accurate results, every individual TaqMan MicroRNA Assay design has been functionally validated under laboratory conditions.

## **Distinguish Between Highly Homologous Mature miRNAs**

TaqMan MicroRNA Assays are not only specific for mature miRNAs, they can also successfully distinguish between highly homologous targets. As many miRNA family members (i.e. the let-7 miRNA family) differ in sequence by as little as one base, real-time PCR using TaqMan Assays gives the specificity needed for differentiation.

## **Requires Only Minimal Starting Materials**

TaqMan MicroRNA Assays are extremely sensitive—researchers need only 1–10 *nanograms* of purified total RNA or equivalent to reliably quantify their miRNAs of interest, not the several *micrograms* typically required for hybridization-based methods.

## **Unparalleled Dynamic Range**

TaqMan MicroRNA Assays deliver the wide linear dynamic range TaqMan Assays are known for—up to seven logs. This means that researchers can accurately quantitate miRNA targets varying from a few copies to millions of copies in the same experiment. This is an important factor given the wide range of miRNA concentrations within and across different cells, tissue types, and disease states.

## **Fast Time-to-Results**

By taking advantage of gold-standard TaqMan® reagent-based technology with universal thermal cycling conditions, TaqMan MicroRNA Assays are familiar, fast, and easy to set up. Just start with your total RNA sample, and get results in less than three hours using any Applied Biosystems Real-Time PCR System.

## **Convenient and Scalable Solution**

TaqMan MicroRNA Assays are pre-designed, functionally validated, and available off-the-shelf from Applied Biosystems, making them extremely convenient. Spend your valuable time generating results, not designing and troubleshooting assays.





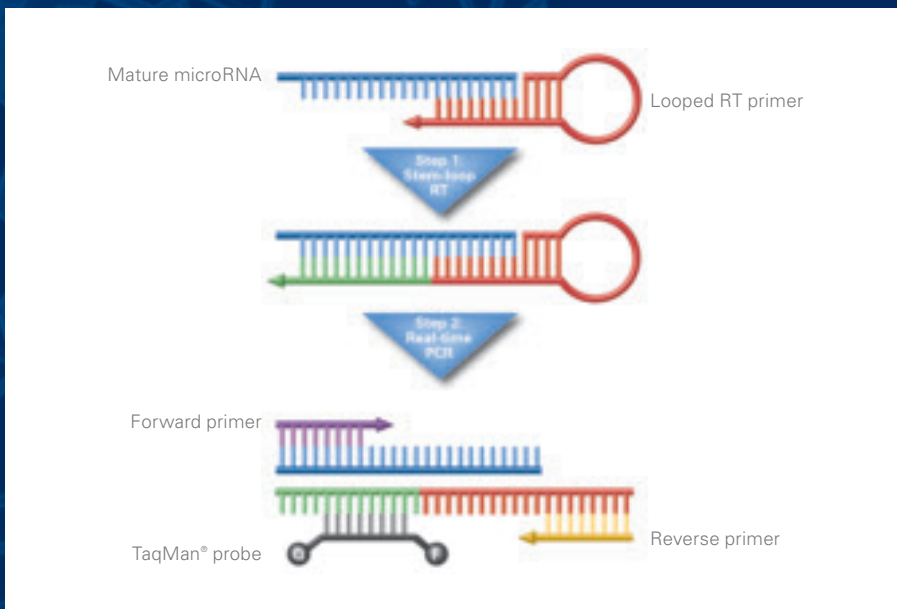
### Broad Range of Species

TaqMan MicroRNA Assays are available for a range of species, including human, mouse, rat, *Drosophila*, *C. elegans*, and *Arabidopsis*. Endogenous controls for human and mouse assays are also available. Applied Biosystems will continue to increase the number of TaqMan MicroRNA Assays for these species, with the goal of keeping aligned with the Sanger miRBase Registry (<http://microRNA.sanger.ac.uk/sequences/index.shtml>).

### TaqMan MicroRNA Reverse Transcription (RT) Kit

The TaqMan MicroRNA RT Kit provides the necessary components for optimal performance of TaqMan MicroRNA Assays. Components of this kit are used with the RT primer provided with the MicroRNA Assay to convert miRNA to cDNA. This kit is available in 200 or 1,000-reaction sizes.

Additional TaqMan MicroRNA Assay Products will become available in the near future. Register for product updates at [mirna.appliedbiosystems.com](http://mirna.appliedbiosystems.com).



TaqMan MicroRNA Assays. A simple, two-step mechanism brings the advantages of real-time PCR to miRNA quantitation.

# TaqMan® PreAmp Master Mix Kit

- Amplifies cDNA targets equally without introducing bias
- Multiplex up to 100 gene expression targets with minimal hands-on time
- Stretches 1 ng of cDNA into 200 real-time PCR reactions for gene expression analysis using TaqMan® Gene Expression Assays
- Ideal for laser capture microdissections, needle biopsies, and paraffin-embedded tissues

New TaqMan® PreAmp Master Mix (Early Access) from Applied Biosystems preamplifies small amounts of cDNA without introducing amplification bias to the sample. Gene expression analysis of scarce cDNA is no longer inaccurate and labor-intensive. The TaqMan PreAmp Master Mix Kit uniformly enriches 1 to 250 ng of starting cDNA material for up to 100 gene targets using a pool of TaqMan® Gene Expression Assays as a source of primers. The PreAmp kit provides a simple, easy workflow and quantitative, reproducible results.

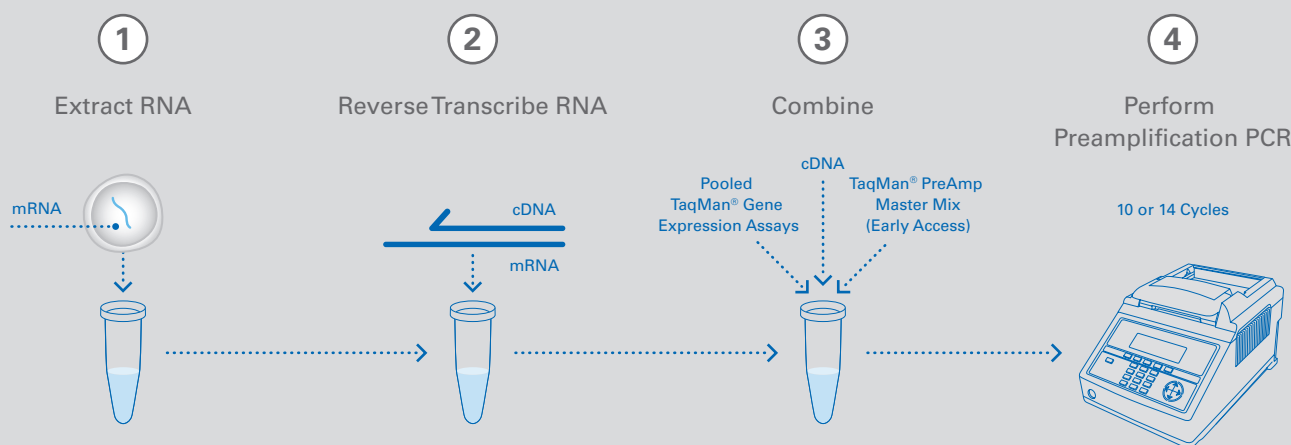
The standard real-time PCR reaction for gene expression analysis starts with the reverse transcription of total RNA to cDNA using random primers, followed by real-time PCR using a probe and gene-specific primers. With the TaqMan PreAmp

Master Mix, an intermediate multiplex step between reverse transcription and real-time PCR is performed in which the cDNA is enriched for up to 100 gene targets using a pool of TaqMan Gene Expression Assays. The preamplification reaction is cycled for 10 or 14 cycles to generate approximately 1,000- to 16,000-fold amplification of each gene-specific target. The resulting preamplified reaction is diluted and serves as the starting material for the subsequent singleplex real-time PCR with each of the individual TaqMan Gene Expression Assays represented in the assay pool.

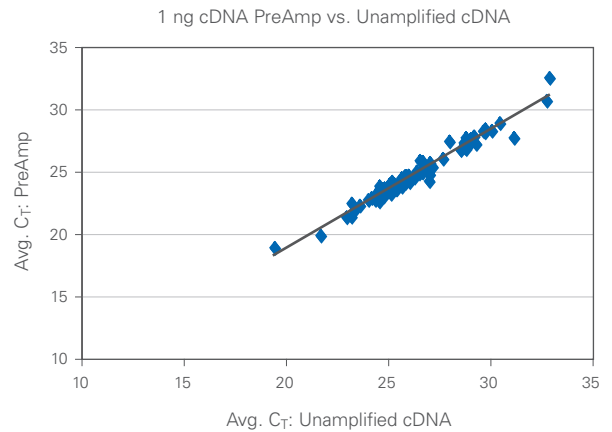
## Uniform, Unbiased Amplification

TaqMan PreAmp Master Mix has been shown to provide virtually no difference in the  $\Delta\Delta C_T$  between preamplified cDNA

## SIMPLE GENE EXPRESSION ANALYSIS WORKFLOW



The complete workflow for analyzing gene expression using TaqMan® PreAmp Master Mix. The preamplification step takes only 15 additional minutes of hands-on time and 1.5 hours of cycling time.



The average  $C_T$  values for preamplified reactions are plotted along the y-axis and the average  $C_T$  values for the control (unpreamplified) cDNA sample (3 ng/reaction) are plotted along the x-axis. This graph has an  $R^2 = 0.977$ .

from 1 ng to 250 ng of starting material and control cDNA. For these preamplified targets, TaqMan PreAmp Master Mix provides extremely high correlation between the  $C_T$  values for cDNA and control cDNA for 1 ng and 25 ng of starting material (data above).

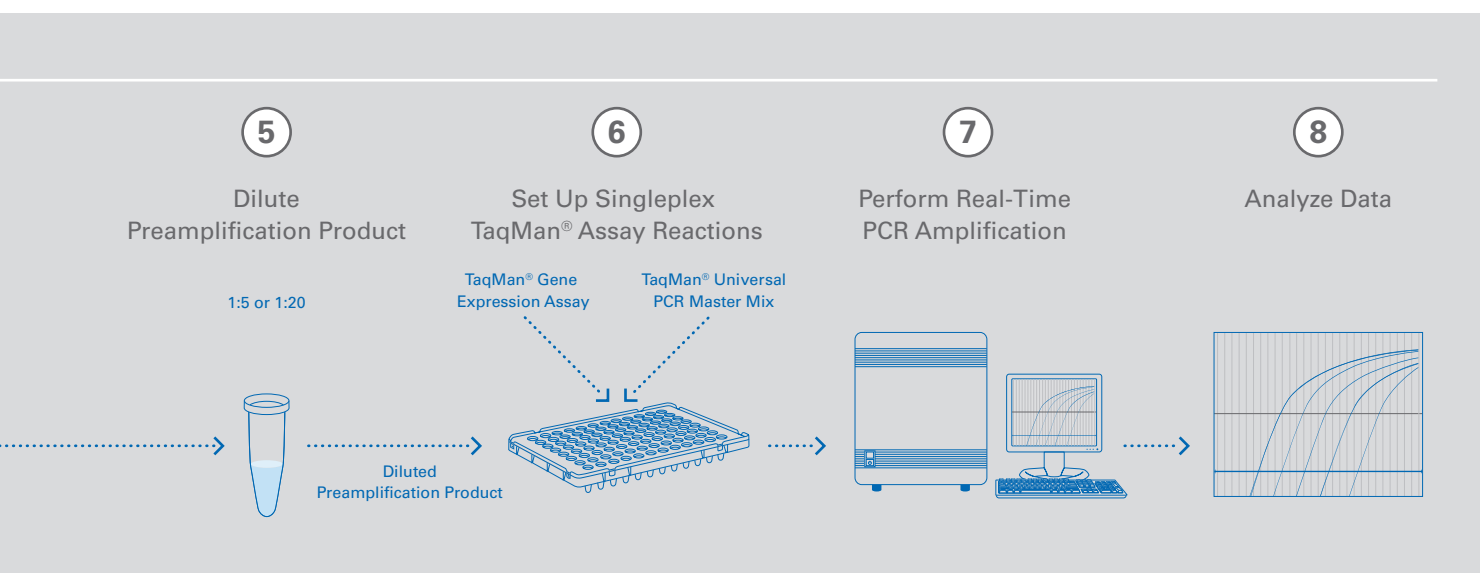
Reliable and uniform preamplification enables researchers to analyze gene expression for limited quantities of cDNA samples from needle biopsies, laser capture microdissections (LCMs), and formalin-fixed paraffin-embedded (FFPE) samples.

#### Complete Product Suite for Seamless Workflow

The TaqMan PreAmp Master Mix Kit comes with the new TaqMan PreAmp Master Mix and our TaqMan Universal

PCR Master Mix. Both reagents work in tandem to provide optimal preamplification of cDNA. In addition to the TaqMan PreAmp Master Mix Kit, other Applied Biosystems products required for successful preamplification of cDNA include:

- TaqMan Gene Expression Assays
- High Capacity cDNA Reverse Transcription Kit
- GeneAmp® PCR System 9700
- Applied Biosystems 7300, 7500, 7500 Fast or 7900HT Fast Real-Time PCR System



Visit [www.appliedbiosystems.com](http://www.appliedbiosystems.com) for complete information on each of these integral products.

# Product Specification Comparison

	Fill Volumes	Number of Reactions	Available Reporter Dye Labels	Universal Formulation	Approximate Delivery Time	Part Number
<b>TaqMan® Gene Expression Assays</b>						
Inventoried	250 µL, 20X	250 (@20 µL)	FAM™	Yes	2–3 days	4331182
Made-to-Order	360 µL, 20X	360 (@20 µL)	FAM	Yes	5–10 days	4351372
<b>Custom TaqMan® Gene Expression Assays</b>						
Small-scale	360 µL, 20X	360 (@20 µL)	FAM	Yes	10–14 days	4331348
Medium-scale	750 µL, 20X	750 (@20 µL)	FAM	Yes	10–14 days	4332078
Large-scale	967 µL, 60X	2,900 (@20 µL)	FAM	Yes	10–14 days	4332079
<b>TaqMan® Endogenous Controls</b>						
Primer limited			VIC®	Yes		Various—see page 8
Not primer limited			FAM	Yes		Various—see page 8
<b>Custom TaqMan® Probes and Primers</b>						
			FAM	No	4–7 days	Various—see page 14
			VIC	No	4–7 days	Various—see page 14
			TET™	No	4–7 days	Various—see page 14
			NED™	No	4–7 days	Various—see page 14
TaqMan® PreAmp Master Mix	1 mL	40 (@50 µL)			2–3 days	4364130
TaqMan® MicroRNA Assays		150 (@20 µL)	FAM	Yes	2–3 days	Multiple*
Custom TaqMan® Low Density Arrays†		384 (@1 µL)			4–6 weeks	Various—see page 10
TaqMan® Low Density Array Gene Signature Panels‡		384 (@1 µL)			2–3 days	Various—see page 20

\* Visit [mirna.appliedbiosystems.com](http://mirna.appliedbiosystems.com) for the current list of available miRNA assays.

† Choose from any Inventoried TaqMan Gene Expression Assays.

‡ Pre-defined panels of TaqMan Gene Expression Assays.

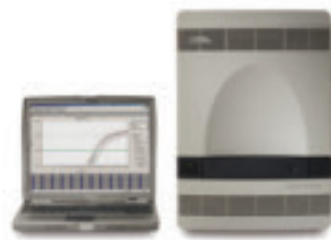
# TaqMan® Low Density Array Gene Signature Panels

Gene Signature Panel Name	Number of Targets/Controls	Format	Pack Size	Part Number
Human Immune Panel	90/6	Format 96a	4 cards/pack	4370573
Mouse Immune Panel	90/6	Format 96a	4cards/pack	4367786
Human Protein Kinase Panel	94/2	Format 96a	4 cards/pack	4367786
Human GPCR Panel	367/14	Format 384	4 cards/pack	4367785
Mouse GPCR Panel	365/16	Format 384	4 cards/pack	4378703
Human ABC Transporter Panel	50/14	Format 64	4 cards/pack	4378700
Human Apoptosis Panel	93/3	Format 96a	4 cards/pack	4378701
Human Endogenous Control Panel	16	Format 16	2 cards/pack	4367563
Mouse Endogenous Control Panel	16	Format 16	2 cards/pack	4378702
Rat Endogenous Control Panel	16	Format 16	2 cards/pack	4378704

More panels will be available soon. Register to receive new Gene Signature Panel product announcements, or suggest a panel at [tlda.appliedbiosystems.com](http://tlda.appliedbiosystems.com)

# Applied Biosystems Real-Time PCR Systems

Applied Biosystems Real-Time PCR Systems make real-time PCR more accessible than ever before by providing powerful solutions to fit the needs of any laboratory. These systems are easy to use with next generation software, and of course, they're backed by Applied Biosystems unmatched track record of performance, quality and long-term reliability.

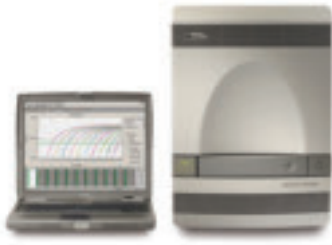


## **Applied Biosystems 7900HT Fast Real-Time PCR System**—the ultimate in performance and flexibility

- User-interchangeable block options include 384-well, 96-well, TaqMan® Low Density Array and Fast 96- and 384-well
- Extended-life 488 nm argon-ion laser combined with continuous wavelength detection from 500–660 nm provides unmatched dye resolution capabilities
- Automation Accessory provides walk away automation for unmatched throughput
- Enterprise Edition Software enables hundreds to thousands of plates to be analyzed simultaneously and assists with 21 CFR part 11 compliance

## **Applied Biosystems 7500 and 7500 Fast Real-Time PCR Systems**—versatile platforms for users requiring extended capabilities

- Advanced five-color optical configuration supports a broader range of fluorophores, with variable excitation capability allowing greater sensitivity for longer wavelength (red) dyes
- A high-speed 96-well thermal cycling block option enables real-time PCR results in under 40 minutes
- User-customizable SDS v1.4 21CFRp11 Module offers all the tools needed to assist you with compliance for FDA 21CFR Part 11 regulations



**Applied Biosystems 7300 Real-Time PCR System—**  
an economical solution setting the standard for the basic researcher

- Four-color detection provides the flexibility to perform all major applications
- Powerful and versatile software makes experimental set-up and data processing simple and straightforward
- Precision optics and a charge-coupled device (CCD) camera provide highly accurate, reproducible and reliable results
- Patented sample temperature control provides superior reproducibility and consistent, high-quality results

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