TaqMan Fast Advanced Master Mix

Performance superior to standard master mixes in less than half the time

Features and benefits

- **Best-in-class performance**—superior sensitivity, accuracy, dynamic range, and specificity compared to standard mixes in standard mode
- **Engineered for enhanced benchtop stability**—stable at room temperature for up to 72 hours in preassembled reactions
- **Optimized for multiplexing**—validated for duplexing with exogenous and endogenous internal positive control assays
- **Reduced run times**—optimized on fast instruments and for fast cycling conditions on standard instruments
- **Seamless transition through the workflow**—validated with Applied Biosystems™ TaqMan™ Assays for gene expression and microRNAs and Applied Biosystems™ TaqMan™ Array Microfluidic Cards

Applied Biosystems™ TaqMan™ Fast Advanced Master Mix has been designed to perform better than standard master mixes (Figure 1), requiring shorter run times (<40 minutes) and delivering superior results.

Our best-in-class gene expression master mix employs Applied Biosystems™ AmpliTaq™ Fast DNA Polymerase, which has been engineered for enhanced stability, allowing your preassembled reactions to be left at room temperature for up to 72 hours without impacting performance. The formulation has been optimized for duplex PCR with both endogenous and exogenous control assays, enabling you to run a control in every well to further increase confidence in your results.

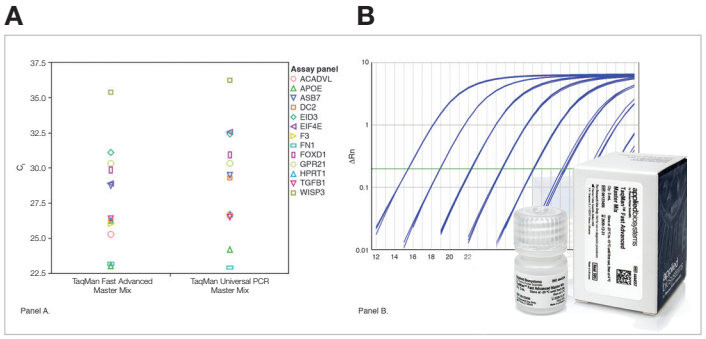


Figure 1. Performance of TaqMan Fast Advanced Master Mix vs. Applied Biosystems™ TaqMan™ Universal PCR Master Mix. (A) Comparison of C_t values across a panel of 13 TaqMan Gene Expression Assays. **(B)** Representative amplification plot from real-time PCR of a dilution series of human cDNA amplified in 4 replicate reactions using the Applied Biosystems™ 7500 Fast Real-Time PCR System and the *FN1* TaqMan Gene Expression Assay.

For maximum flexibility, TaqMan Fast Advanced Master Mix has also been optimized for use on both fast instruments and fast PCR cycling conditions on standard instruments. TaqMan Fast Advanced Master Mix has been rigorously tested and optimized to help ensure success with all TaqMan gene expression and microRNA assays, enabling a seamless transition through your workflow.

Table 1. Dynamic range comparison between TaqMan Fast Advanced Master Mix and products from other leading suppliers. Comparison of detection range (in number of logarithmic units) across a panel of various TaqMan Gene Expression Assays. The range of detection must have PCR efficiency between 85% and 115% and R^2 values ≥0.98. Each master mix was tested using cDNA template and run according to the manufacturers' respective recommended protocols. Reactions (6 replicates) were run on the Applied Biosystems™ 7900HT Fast Real-Time PCR System.

Assay	Assay type	TaqMan Fast Advanced Master Mix	Roche FastStart Reagent	Qiagen QuantiTect Reagent	Qiagen QuantiFast Reagent	Bio-Rad iTaq Supermix	Bio-Rad iTaq Fast Supermix
APOA1	Good Fast	7	5	5	5	5	5
APOA1 (FAM)/ *GAPDH* (VIC)	Good Fast	7	4	4	5	5	5
APOA1 (FAM)/ *GAPDH* (VIC)	Housekeeping	7	7	7	7	7	7
UBC	Housekeeping	6	4	4	5	5	5
HIST1H3F	LenAmpLong	5	3	3	3	3	3
TXNDC	GCAmpLow, PrimerLong	5	2	2	3	3	3
FOXD1	GCAmpHigh	4	2	2	2	2	2
GPR34	GCProbeLow, Low dRn	3	1	2	2	2	2
WISP	HighProbeTm	2	0	0	1	1	1

Orders of magnitude	Final (ng/µL)
7	0.00001
6	0.0001
5	0.001
4	0.01
3	0.1
2	1
1	10

Best-in-class performance

TaqMan Fast Advanced Master Mix was designed to perform better than current standard master mixes. Our master mix was benchmarked against the leading suppliers' standard and fast master mixes to demonstrate our superior sensitivity, accuracy, dynamic range, and specificity.

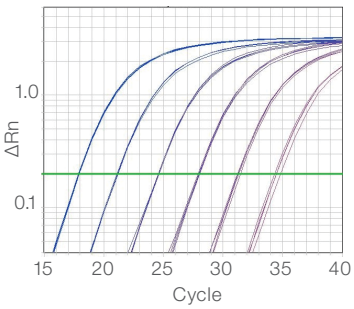
The unparalleled dynamic range of TaqMan Fast Advanced Master Mix is shown in Table 1. These results demonstrate the ability of the master mix to provide dependable target quantitation over a wider dynamic range compared to leading suppliers' standard and fast master mixes. For a variety of assays, TaqMan Fast Advanced Master Mix was capable of detection across 2 additional orders of magnitude when run under identical conditions.

Benchtop stability for high-throughput handling and convenience

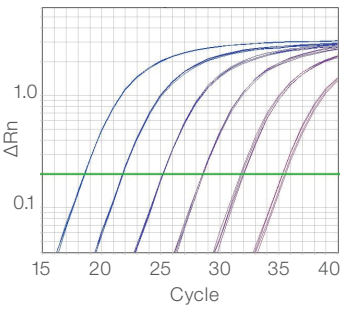
TaqMan Fast Advanced Master Mix has been engineered to retain its high level of performance in preassembled reactions for up to 72 hours. If you use high-throughput liquid handling systems, the stability of this mix helps to ensure that the results on the first plate will mimic those of the last plate. For less extreme throughput needs, the enhanced stability of this master mix provides overall added convenience to your workflow, as you are no longer constrained to immediately running your plates upon assembly.

Figure 2 shows an assay that was run upon assembly (time 0) and after 72 hours of incubation at 30°C, simulating the most extreme room temperature scenario. The results after 72 hours show excellent PCR efficiency and R^2 values, almost identical to those at time 0, as well as a ΔC_t between time 0 and 72 hours of less than 1.

A



B

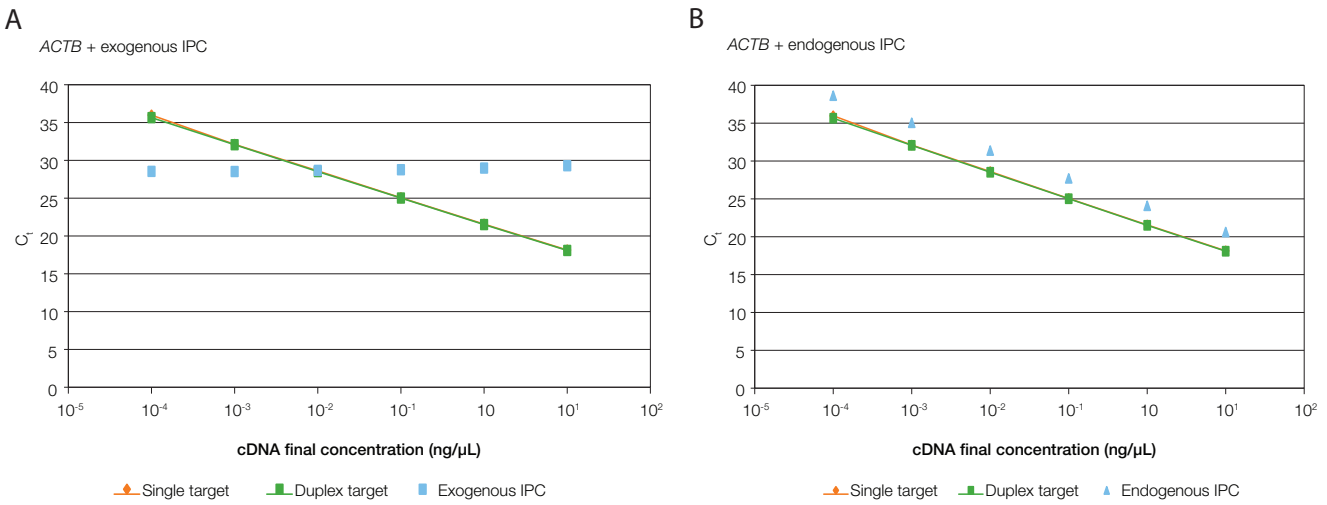


C

PCR efficiency		R^2	
0 hr	72 hr	0 hr	72 hr
99.7%	100.0%	0.9998	0.9997

Final concentration (ng/µL)	C_t	
cDNA	0 hr	72 hr
10	17.81	18.34
1	20.99	21.59
0.1	24.32	24.95
0.01	27.65	28.24
0.001	31.18	31.80
0.0001	34.34	34.80

Figure 2. Benchtop stability of TaqMan Fast Advanced Master Mix. This *B2M* TaqMan Gene Expression Assay was run **(A)** upon assembly (time 0) and **(B)** after 72 hr of incubation at 30°C. **(C)** The results after 72 hr show excellent PCR efficiency, R^2 values, and C_t values when compared to time 0.



Exogenous duplex

	PCR efficiency	R^2
Single target	92.9%	0.999
Duplex target	95.1%	1.000

Endogenous duplex

	PCR efficiency	R^2
Single target	92.9%	0.999
Duplex target	92.6%	1.000

Figure 3. TaqMan Fast Advanced Master Mix is optimized for multiplexing with exogenous or endogenous control assays. Results are shown for *ACTB* (β-actin gene), which was serially diluted and amplified in single-target reactions and duplex reactions. The duplex reactions included the single target *ACTB* and either **(A)** a constant quantity of exogenous target or **(B)** a relative quantity of endogenous target.

Optimized for multiplexing

We realize that confidence is paramount when it comes to your results. For added confidence in your results, TaqMan Fast Advanced Master Mix was designed to help deliver accurate results for duplex reactions using an internal positive control (IPC). Figure 3 shows results for the experimental target gene *ACTB* (β-actin), which was serially diluted and amplified in both single-target reactions and duplex reactions. The duplex reactions included the single target *ACTB* and either a constant quantity of exogenous target (Figure 3A) or a relative quantity of endogenous target (Figure 3B). TaqMan Fast Advanced Master Mix succeeded in providing nearly identical PCR efficiency, R^2, and C_t values for *ACTB* in both simplex and duplex environments.

Validated for microRNA assays

TaqMan Fast Advanced Master Mix has been validated for multiple real-time PCR applications, including microRNA assays. The formulation provides high specificity and a large dynamic range, the two most critical performance attributes that define successful results when working with microRNAs. The data in Figure 4 demonstrate excellent PCR linearity over a range of inputs, covering 6 orders of magnitude.

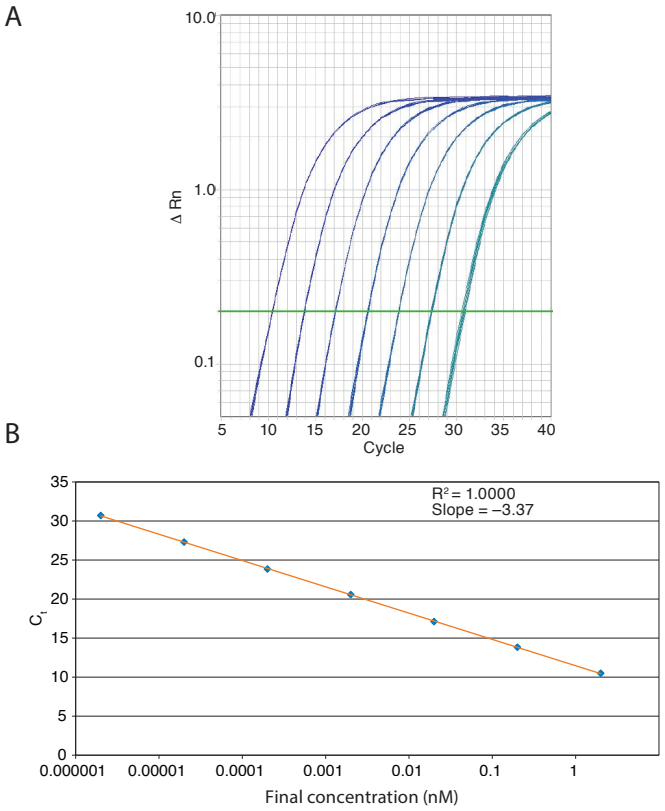


Figure 4. miRNA linear target amplification over a dynamic range of 6 orders of magnitude of input. (A) Amplification plot and **(B)** standard curve from real-time PCR of a dilution series of a synthetic target amplified in 4 replicate reactions using the 7900HT Fast Real-Time PCR System and the Let-7c TaqMan MicroRNA Assay.

Reduced run times on standard instrumentation

TaqMan Fast Advanced Master Mix has been optimized for use with both fast and standard instrumentation, enabling researchers who currently own standard instruments to realize the performance benefits and time savings this mix provides. Figure 5 showcases the impressive results achieved when using TaqMan Fast Advanced Master Mix under fast thermal cycling conditions on the Applied Biosystems™ QuantStudio™ 12K Flex Real-Time PCR System. The mix has been tested with all Applied Biosystems™ standard real-time PCR instrumentation, including the QuantStudio, 7900HT, 7500, and 7300 systems, to enable success whether or not you own a fast-enabled instrument.

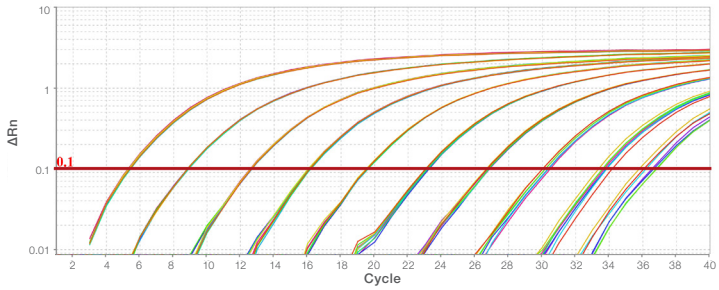


Figure 5. Results on the QuantStudio 12K Flex Real-Time PCR System using TaqMan Fast Advanced Master Mix. Amplification plot from real-time PCR of a dilution series of human cDNA amplified in 8 replicate reactions using the Eukaryotic 18S rRNA TaqMan Gene Expression Assay and the QuantStudio 12K Flex Real-Time PCR System.

Ordering information

Size	Quantity	No. of 20 µL rxns	Cat. No.
TaqMan Fast Advanced Master Mix			
Mini Pack	1 x 1 mL	100	4444556
1 Pack	1 x 5 mL	500	4444557
2 Pack	2 x 5 mL	1,000	4444963
5 Pack	5 x 5 mL	2,500	4444964
10 Pack	10 x 5 mL	5,000	4444965
Bulk Pack	1 x 50 mL	5,000	4444558

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