TaqMan® MicroRNA Assays Product Overview

Gold Standard Technology for MicroRNA Research

Based on gold standard TaqMan® probe 5' nuclease chemistry and using a novel stem-loop RT primer, individual pre-designed TaqMan® MicroRNA Assays are probe and primer sets that help enable accurate quantitation of the biologically active mature miRNA, delivering unsurpassed data quality with off-the-shelf convenience.

Features and Benefits

1. Performance

Sensitivity

TaqMan® MicroRNA Assays can detect as few as ten copies of transcript in a sample; even small changes are detected.

Specificity

Quantify only the miRNA target of interest; specifically targets only the more biologically significant mature form. Designed using a proprietary assay design algorithm, QC'd *in silico*, and mapped against the most recent Sanger version.

Minor Groove Binder (MGB) moiety (5' FAM™ reporter dye/ 3' MGB/nonfluorescent quencher [NFQ])

- Stabilizes the hybridized probe, resulting in better assay design
- Allows the probe to be shorter than traditional dual-labeled probes, enabling you to effectively target difficult sequences and increase specificity
- Effectively raises the melting temperature—ideal for detecting single base-pair mismatches

Dynamic Range

Greater than seven logs of dynamic range ensures accurate quantitation of targets ranging from a few copies to millions of copies in the same experiment.

2. Quality

We perform mass spec identity verification, yield testing, and a "No Template Control" (NTC) on every assay. Our chemistry and design pipeline were validated on over 1,500 assays through functional wet bench testing.

3. Convenience

Assays are shipped in a preformulated (5X for RT, and 20X for TaqMan® Assay) liquid format on dry ice and arrive ready to use (no need to resuspend or mix different components).

Species	Available Assays	Total miRBase (Sanger v13.0)	Coverage
H. sapiens	811	885	92%
M. musculus	583	689	85%
R. norvegicus	349	349	100%

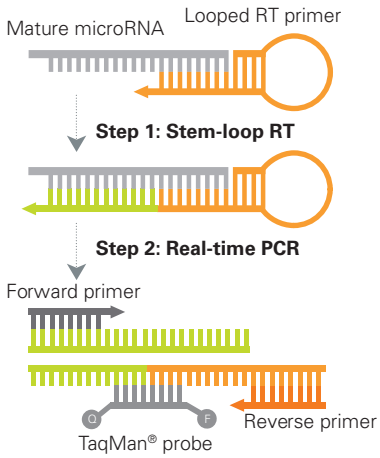

Figure 1. TaqMan® MicroRNA Assay Design. Applied Biosystems® TaqMan® MicroRNA Assays follow a two-step process: (1) RT with an miRNA-specific stem-loop primer, followed by (2) a TaqMan® MicroRNA Assay (real-time PCR) using universal thermal cycling conditions.

Expansive miRNA inventory coverage—Sanger miRBase driven

Universal cycling conditions—no optimization required; any assays can be run together on a single plate

Complete validated workflow—TaqMan® MicroRNA Assays are part of a complete validated miRNA workflow that includes Ambion® and Applied Biosystems® reagents for sample preparation, reverse transcription of RNA, singleplex real-time PCR assay reactions, and real-time PCR amplification and data analysis

4. Formats/Flexibility

Easily scale up and down with various formats

- Single-tube inventoried assays for target quantitation
- TaqMan® MicroRNA Arrays for profiling studies (available for human, mouse, and rat) along with Megaplex™ RT Pools

A wide selection of endogenous controls and short amplicon assays are available; custom service is also available to provide assays with different dyes and in various scales. An early-access Custom TaqMan® Small RNA Assays Tool (**www4.appliedbiosystems.com/beta/smallrna**) enables submitting a sequence for an assay design to any small RNA.

5. Workflow

Applied Biosystems offers a complete collection of TaqMan® MicroRNA Assays. These convenient, pre-designed, functionally validated products are available in a variety of formats to best meet a wide range of research needs. Spend your valuable time generating results, not designing and troubleshooting assays.

TaqMan® MicroRNA Assays Product Overview

Competitive Data Comparisons

These data figures are from the "TaqMan® MicroRNA Assays—The Gold Standard" presentation, available at **mirna.appliedbiosystems.com** in the "Product Information" section. Please refer to this presentation for the complete benchmarking data.

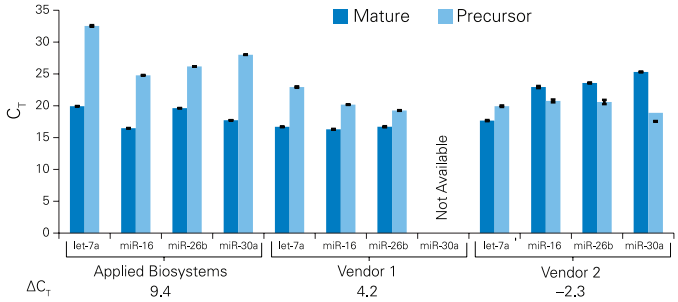

Figure 2. The high biological significance[1] of mature miRNAs merits the need for TaqMan® MicroRNA Assays' high level of discrimination between precursor and mature forms.

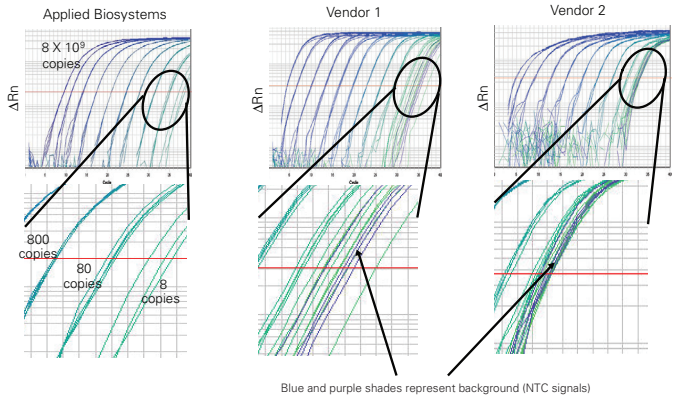

Figure 3. Applied Biosystems® TaqMan® MicroRNA Assays show a linear dynamic range of nine logs and can reliably detect as few as ten copies of synthetic miRNA in PCR. Other methods show high variation and background signal with this amount. Compromised sensitivity imposes a significant risk of insufficient detection of miRNA at various levels of expression.

Ordering Information

Assay Type	Number of 20 µL PCR Reactions (20X concentration)	Reporter/ Quencher Dye	Approximate Delivery Time	Part Number
Inventoried	150	FAM™/MGB-NFQ	1–4 business days	4427975

Ordering Method

Quick Assay Search

Assays can be ordered online by searching by gene name, gene symbol, or any other Sanger gene annotation information. Links to assay pages are available at **mirna.appliedbiosystems.com**.

GeneAssist™ miRNA Workflow Builder

Simplify your assay selection by using the GeneAssist™ miRNA Workflow Builder. Satisfy your experimental needs for functional analysis with Ambion® Pre-miR™ miRNA Precursors and Ambion® Anti-miR™ miRNA Inhibitors, available for each miRNA of interest at **www5.appliedbiosystems.com/tools/mirna**.

Instrument Compatibility

- 7900HT Fast Real-Time PCR System
- 7500 and 7500 Fast Real-Time PCR Systems
- 7300 Real-Time PCR System
- StepOne™ and StepOnePlus™ Real-Time PCR Systems
- Legacy ABI Sequence Detection Systems
- Can also be used on other real-time PCR instruments

Resources

Microsite URL: **mirna.appliedbiosystems.com**
Technical Support: 800.327.3002, prompt 5
Product Bulletin: TaqMan® MicroRNA Assays and Arrays (127PB14)
Protocol: TaqMan® MicroRNA Assays (PN 4364031)

Competitive Data Comparisons

TaqMan® MicroRNA Assays—The Gold Standard (127MI70)

Application Notes

High Correlation of miRNA Quantitation Data from Matched FFPE and Snap-Frozen Tissues Using TaqMan® MicroRNA Assays (130AP03)
Endogenous Controls for Real-Time Quantitation of miRNA Using TaqMan® MicroRNA Assays (127AP11)

Scientific Posters

MicroRNA expression signature in human glioblastoma multiforme brain tumor (127PR07)
TaqMan®-based miRNA profiles classify mouse ES and differentiated cells (127PR08)
MicroRNA quantitation by RT-PCR (127PR05)

References and Additional Reading

1. Du T and Zamore PD (2005) microPrimer: the biogenesis and function of microRNA. *Development* 132:4645–4652.
2. Tavazoie SF et al. (2008) Endogenous human microRNAs that suppress breast cancer metastasis. *Nature* 451:147–152.
3. Chen C et al. (2007) Defining embryonic stem cell identity using differentiation-related microRNAs and their potential targets. *Mamm Genome* 18:316–327.
4. Liang Y et al. (2007) Characterization of microRNA expression profiles in normal human tissues. *BMC Genomics* 8:166–185.
5. Chen C et al. (2005) Real-time quantification of microRNAs by stem-loop RT-PCR. *Nucleic Acids Res* 33:e179.
6. Mestdagh P et al. (2008) High-throughput stem-loop RT-qPCR miRNA expression profiling using minute amounts of input RNA. *Nucleic Acids Res* 36:e143.