qScript® Ultra SuperMix

Faster, better, tougher next generation cDNA SuperMix for cDNA synthesis

FEATURES AND BENEFITS:

- Enhanced Thermostability – Engineered for RT activity up to 65°C, overcoming challenging secondary structures
- Superior Speed – 10 minute reaction time with a total protocol time of 13 minutes
- Maximum Yield & Sensitivity – Wide dynamic range with no loss in cDNA abundance linearity from total RNA 2.5 µg – 1 pg
- Ultimate Inhibitor Resistance – Overcome a wide array of PCR inhibitors (salt, heparin, melanin, etc.)
- Balanced Coverage of Long Transcripts – Unbiased representation of the transcriptome in cDNA product
- Ease of Use – Single tube mix with all required components for cDNA synthesis except RNA template

DESCRIPTION:

qScript Ultra SuperMix is a highly stabilized, efficient and easy-to-use single tube master mix for the synthesis of first-strand cDNA to reverse transcribe RNA to cDNA. A key component is a novel, state-of-the-art, RNase H deficient reverse transcriptase that was engineered for improved thermostability, velocity, processivity, and resistance to many common inhibitors. qScript Ultra SuperMix contains all required components for first-strand cDNA synthesis except RNA template and is directly compatible with downstream 2-step RT-qPCR or RT-PCR procedures.

Enhanced Thermostability & Superior Speed

qScript Ultra SuperMix is engineered for RT activity up to 65°C, with an optimal reaction temperature of 55°C. The reaction time is 10 minutes with a total protocol time of 13 minutes. This rapidly reduces time to result while working through challenging secondary RNA structures.

Product	1st Temp	Anneal primers	2nd Temp (Optimal)	Reverse transcription	3rd Temp	RT inactivation	Total Time
qScript Ultra SuperMix	25°C	2 min	55°C	10 min	95°C	1 min	13 min
Invitrogen™ SuperScript™ IV VILO™ MM	25°C	10 min	50°C	10 min	85°C	5 min	25 min
Thermo Scientific™ Maxima H Minus cDNA Synthesis Master Mix	25°C	10 min	50°C	15 min	85°C	5 min	30 min
NEB LunaScript® RT SuperMix Kit	25°C	2 min	55°C	10 min	95°C	1 min	13 min

Table 1 **Comparison of protocol length for first-strand cDNA synthesis kits.** Incorporating the highly rapid and processive qScript Ultra reverse transcriptase, the qScript Ultra SuperMix requires 10 minutes for first-strand cDNA synthesis over a broad range of input RNA quantities.

Maximum Yield and Sensitivity

qScript Ultra SuperMix provides maximum yields across a wide variety of RNA input amounts, optimized for 2.5 µg to 1 pg total RNA input with even as little at 100 fg total RNA possible. This product demonstrates fine level discrimination and linear conversion of RNA to cDNA with a high copy reference gene at high input RNA amounts, which further emphasizes accurate and critical expression levels. High efficiency and precision of RNA to cDNA conversion creates optimal cDNA yields for downstream use.

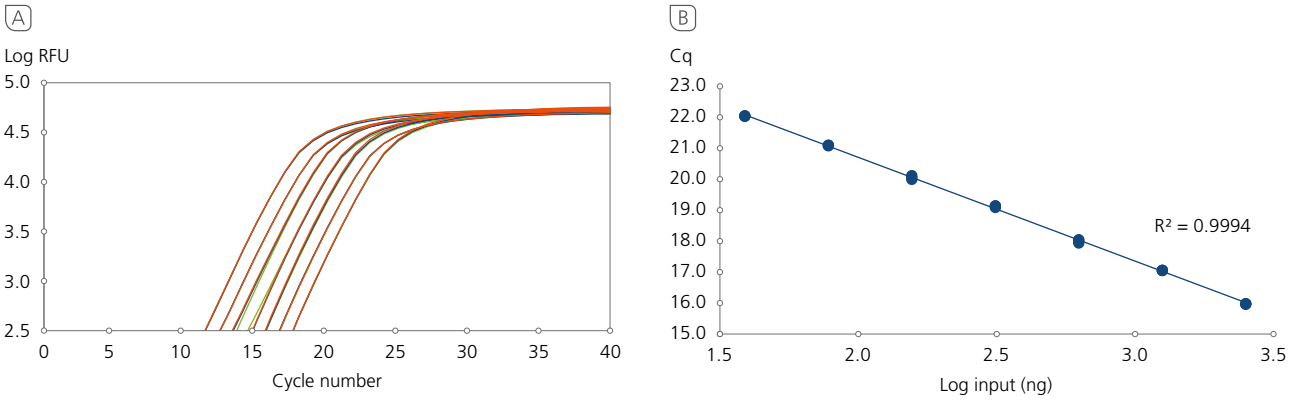

Figure 1 **High Range Input Linearity.** First-strand cDNA synthesis reactions were carried out using increasing quantities of total human RNA input, followed by analysis of a portion of the products by beta-actin qPCR. In only a 10 minute reaction time, the qScript Ultra SuperMix accommodates up to 2.5 µg total RNA input without a loss in cDNA abundance linearity.

qScript Ultra SuperMix demonstrates low-copy sensitivity, linear dynamic range and higher yields of viral RNA in the presence of high levels of carrier RNA. This allows for low RNA input quantities to be detected with consistent yield and reduced dropout. The Quantabio PerfeCTa SYBR Green SuperMix and FastMix were both used for qPCR amplification.

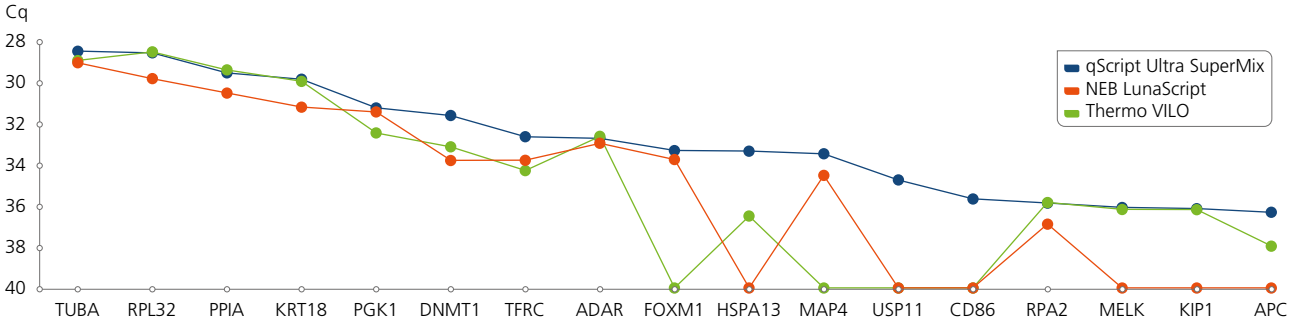

Figure 2 **Low input reaction sensitivity.** First-strand cDNA synthesis reactions were assembled and reacted with 2 pg total human RNA, then a portion (15%) of the reaction was used for qPCR analysis. The Cq values of duplicate reactions were averaged and plotted. Where no amplification took place, values were plotted as Cq = 40.

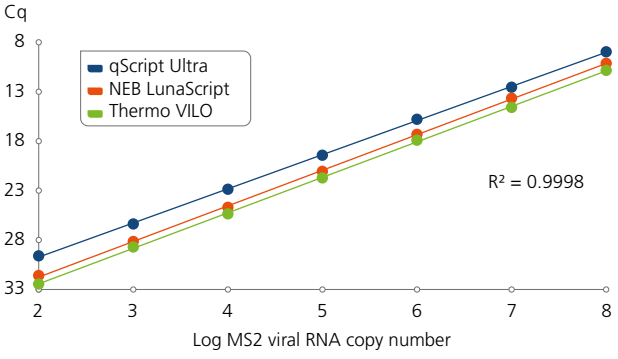

Figure 3 **Viral RNA cDNA synthesis in the presence of carrier RNA.** First-strand cDNA synthesis reactions were assembled and reacted with the indicated quantities of MS2 viral RNA in the presence of 1 µg poly(A), which is a common carrier that can co-purify with viral extraction preparations and potentially react and interfere with detection. qScript Ultra SuperMix displays higher yields of cDNA after qPCR detection of a portion of the viral material.

Inhibitor Resistance

qScript Ultra SuperMix can readily reverse transcribe RNA while overcoming common inhibitors found in blood, skin, plants, and RNA extraction carryover chemicals. The robust, engineered qScript Ultra reverse transcriptase allows for tolerance to many common reaction inhibitors. qScript Ultra SuperMix consistently produces high yields of cDNA even in the presence of these challenging inhibitors. The Quantabio PerfeCTa SYBR Green FastMix, low ROX was used for qPCR amplification.

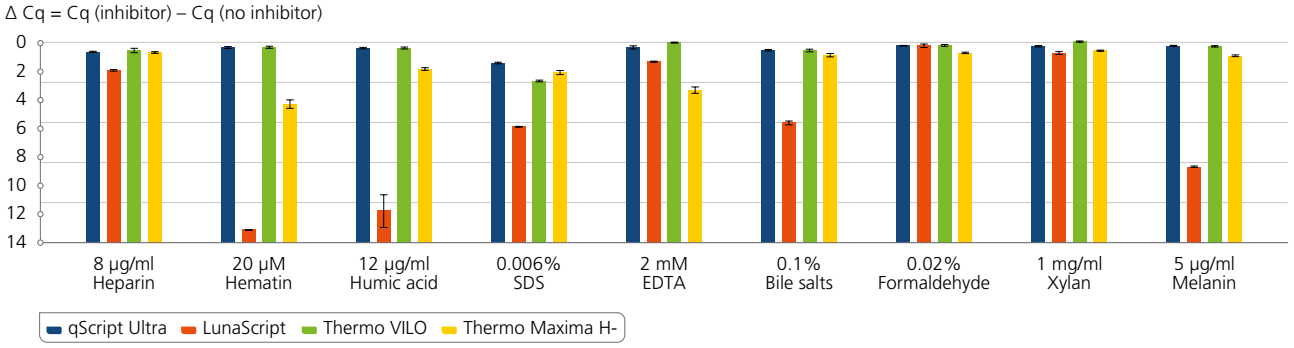

Figure 4 **Inhibitor resistance across wide range of sample types.** Standard, randomer-primed first-stand cDNA synthesis reactions were carried out using 50 ng total human RNA in the presence of several common reaction inhibitors. Following cDNA synthesis, both products and inhibitors were diluted such that 1/50 of the initial reaction was used for qPCR. Cq values were compared with reactions without inhibitors to show relative inhibitor tolerance in the first-strand reaction.

Balanced Coverage of Long Transcripts

qScript Ultra SuperMix can readily reverse transcribe long RNA transcripts in an unbiased manner, maintaining equivalent representation in the qPCR amplification curves throughout the length of the transcript. First strand cDNA synthesis using qScript Ultra SuperMix was performed with total RNA input levels of 100 ng, 10 ng, 1 ng and 100 pg. The Quantabio PerfeCTa SYBR Green FastMix was used for qPCR amplification.

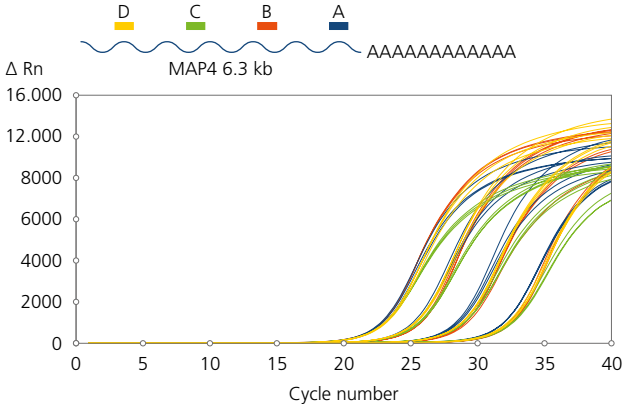

Figure 5 **Balanced coverage of long transcripts.** qPCR primer assays were designed at several intervals along the length of the 6.3 kb MAP4 mRNA transcript. First strand cDNA synthesis using qScript Ultra SuperMix was performed with total RNA input levels of 100 ng, 10 ng, 1 ng and 100 pg. Equivalent Cq calls for 4 different regions of the 6.3 kb transcript spanning the 3'-end near the poly A tail to the 5'-end transcriptional start side, at each input amount of UHR total RNA. The "A" assay refers to the red curves, "B" assay refers to the blue curves, "C" assay refers to the green curves, and "D" assay refers to the yellow curves.

ORDER INFO

Product Name	Quantabio Catalog Number	Size
qScript Ultra SuperMix - 25	95217-025	25 rxns
qScript Ultra SuperMix - 100	95217-100	100 rxns
qScript Ultra SuperMix - 500	95217-500	500 rxns

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