

PrimePCR™ Assay Validation Report

Gene Information

Gene Name	heterogeneous nuclear ribonucleoprotein A1
Gene Symbol	HNRNPA1
Organism	Human
Gene Summary	<p>This gene belongs to the A/B subfamily of ubiquitously expressed heterogeneous nuclear ribonucleoproteins (hnRNPs). The hnRNPs are RNA binding proteins and they complex with heterogeneous nuclear RNA (hnRNA). These proteins are associated with pre-mRNAs in the nucleus and appear to influence pre-mRNA processing and other aspects of mRNA metabolism and transport. While all of the hnRNPs are present in the nucleus some seem to shuttle between the nucleus and the cytoplasm. The hnRNP proteins have distinct nucleic acid binding properties. The protein encoded by this gene has two repeats of quasi-RRM domains that bind to RNAs. It is one of the most abundant core proteins of hnRNP complexes and it is localized to the nucleoplasm. This protein along with other hnRNP proteins is exported from the nucleus probably bound to mRNA and is immediately re-imported. Its M9 domain acts as both a nuclear localization and nuclear export signal. The encoded protein is involved in the packaging of pre-mRNA into hnRNP particles transport of poly A+ mRNA from the nucleus to the cytoplasm and may modulate splice site selection. It is also thought have a primary role in the formation of specific myometrial protein species in parturition. Multiple alternatively spliced transcript variants have been found for this gene but only two transcripts are fully described. These variants have multiple alternative transcription initiation sites and multiple polyA sites.</p>
Gene Aliases	HNRPA1, HNRPA1L3, MGC102835, hnRNP A1, hnRNP-A1
RefSeq Accession No.	NC_000012.11, NT_029419.12
UniGene ID	Hs.546261
Ensembl Gene ID	ENSG00000135486
Entrez Gene ID	3178

Assay Information

Unique Assay ID	qHsaCEP0057966
Assay Type	Probe - Validation information is for the primer pair using SYBR® Green detection
Detected Coding Transcript(s)	ENST00000546500, ENST00000340913, ENST00000330752, ENST00000547276
Amplicon Context Sequence	GAAAGTGTAAGCATTCCAACAAAGGGTTTTAATGTAGATTTTTTTTTTGCACCC CATGCTGTTGATTGCTAAATGTAACAGTCTGATCGTGACGCTGAATAAATGTCTTT TTTTAATGTGCTGTGTAAGTTAGTCTACTCTTAAGCCATCTTGGTAAATTTCCC CAACAGTGTGAAGTTAGAAT
Amplicon Length (bp)	158
Chromosome Location	12:54678547-54678734

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Assay Design	Exonic
Purification	Desalted

Validation Results

Efficiency (%)	101
R²	0.9967
cDNA Cq	18.04
cDNA Tm (Celsius)	79.5
gDNA Cq	20.1
Specificity (%)	100

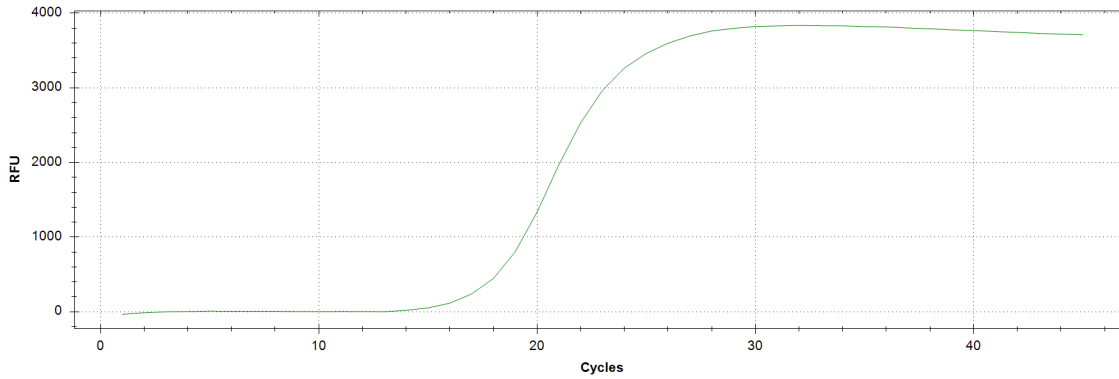
Information to assist with data interpretation is provided at the end of this report.

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HNRNPA1, Human

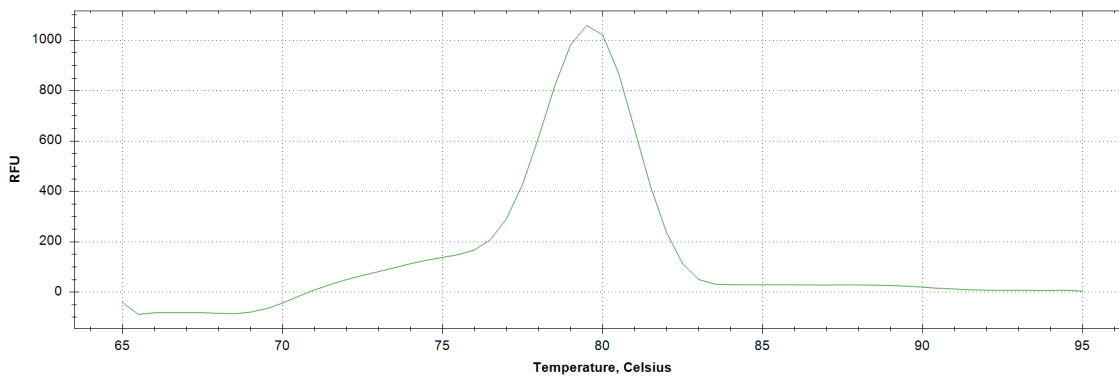
Amplification Plot

Amplification of cDNA generated from 25 ng of universal reference RNA



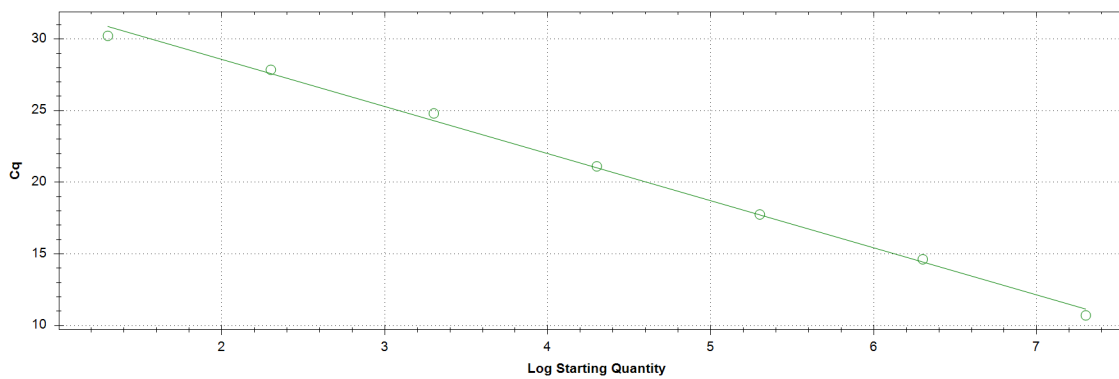
Melt Peak

Melt curve analysis of above amplification



Standard Curve

Standard curve generated using 20 million copies of template diluted 10-fold to 20 copies



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Products used to generate validation data

Real-Time PCR Instrument	CFX384 Real-Time PCR Detection System
Reverse Transcription Reagent	iScript™ Advanced cDNA Synthesis Kit for RT-qPCR
Real-Time PCR Supermix	SsoAdvanced™ SYBR® Green Supermix
Experimental Sample	qPCR Human Reference Total RNA

Data Interpretation

Unique Assay ID	This is a unique identifier that can be used to identify the assay in the literature and online.
Detected Coding Transcript(s)	This is a list of the Ensembl transcript ID(s) that this assay will detect. Details for each transcript can be found on the Ensembl website at www.ensembl.org .
Amplicon Context Sequence	This is the amplicon sequence with additional base pairs added to the beginning and/or end of the sequence. This is in accordance with the minimum information for the publication of real-time quantitative PCR experiments (MIQE) guidelines. For details, please refer to the following publication, "Primer Sequence Disclosure: A Clarification of the MIQE Guidelines" (Bustin et al 2011).
Chromosome Location	This is the chromosomal location of the amplicon context sequence within the genome.
Assay Design	<p>Exonic: Primers sit within the same exon in the mRNA transcript and can potentially co-amplify genomic DNA. If performing gene expression analysis, it is suggested that the samples be treated with a DNase to eliminate potential unwanted signal from contaminating genomic DNA.</p> <p>Exon-exon junction: One primer sits on an exon-exon junction in mRNA. When performing gene expression analysis, this design approach will prevent unwanted signal from contaminating genomic DNA.</p> <p>Intron-spanning: Primers sit within different exons while spanning a large intron in the mRNA (intron is greater than 750bp). When performing gene expression analysis, this design approach should limit potential unwanted signal from contaminating genomic DNA.</p> <p>Small intron-spanning: Primers sit within different exons with a short intron in between (intron is smaller than 750bp). Small introns may not prevent unwanted signal from contaminating genomic DNA.</p>
Efficiency	Assay efficiency was determined using a seven-point standard curve from 20 copies to 20 million copies. While an efficiency of 100% represents a perfect doubling of template at every cycle and is ideal, typical ranges of good assay efficiency are between 90-110%. For difficult targets, assay efficiency outside of this range are accepted and reported accordingly.
R²	The R ² represents the linearity of the standard curve and how well the standard curve data points fit the linear regression line. Acceptable values are >0.98.

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cDNA Cq	<p>Cq value obtained from 25ng of cDNA transcribed from universal RNA when performing wet-lab validation of the assay.</p> <p>Note: Not all genes will be expressed at a detectable level in the universal RNA sample.</p>
cDNA Tm	<p>Melting temperature of the amplicon when running a melt curve analysis.</p>
gDNA Cq	<p>Cq value obtained when running the assay with 2.5ng of genomic DNA. This is more than a moderate level of genomic DNA contamination. Intron-spanning and exon-exon junction assay designs can minimize or eliminate genomic DNA detection.</p> <p>Note: Genomic DNA contamination is often present at variable levels. If concerned about genomic DNA contamination, the genomic DNA contamination control assay is recommended to run with your sample to determine if genomic DNA levels are sufficient to negatively impact results.</p>
Specificity	<p>This value is the percent of specific amplicon reads as measured by next generation sequencing (NGS). While 100% specificity is desirable, small decreases in specificity (<1%) can be due to NGS read errors. More significant reductions are likely due to co-amplification of homologous regions.</p> <p>Note: Since gene expression can be cell type and condition specific, the exact level and impact of co-amplification in a given sample is impossible to predict. If co-amplification is detected, it should be taken into consideration and reported when analyzing gene expression results.</p>