

PrimePCR™ Assay Validation Report

Gene Information

Gene Name	laminin, gamma 1 (formerly LAMB2)
Gene Symbol	LAMC1
Organism	Human
Gene Summary	<p>Laminins a family of extracellular matrix glycoproteins are the major noncollagenous constituent of basement membranes. They have been implicated in a wide variety of biological processes including cell adhesion differentiation migration signaling neurite outgrowth and metastasis. Laminins composed of 3 non identical chains: laminin alpha beta and gamma (formerly A B1 and B2 respectively) have a cruciform structure consisting of 3 short arms each formed by a different chain and a long arm composed of all 3 chains. Each laminin chain is a multidomain protein encoded by a distinct gene. Several isoforms of each chain have been described. Different alpha beta and gamma chain isomers combine to give rise to different heterotrimeric laminin isoforms which are designated by Arabic numerals in the order of their discovery i.e. alpha1beta1gamma1 heterotrimer is laminin 1. The biological functions of the different chains and trimer molecules are largely unknown but some of the chains have been shown to differ with respect to their tissue distribution presumably reflecting diverse functions in vivo. This gene encodes the gamma chain isoform laminin gamma 1. The gamma 1 chain formerly thought to be a beta chain contains structural domains similar to beta chains however lacks the short alpha region separating domains I and II. The structural organization of this gene also suggested that it had diverged considerably from the beta chain genes. Embryos of transgenic mice in which both alleles of the gamma 1 chain gene were inactivated by homologous recombination lacked basement membranes indicating that laminin gamma 1 chain is necessary for laminin heterotrimer assembly. It has been inferred by analogy with the strikingly similar 3' UTR sequence in mouse laminin gamma 1 cDNA that multiple polyadenylation sites are utilized in human to generate the 2 different sized mRNAs (5.5 and 7.5 kb) seen on Northern analysis.</p>
Gene Aliases	LAMB2, MGC87297
RefSeq Accession No.	NC_000001.10, NG_011463.1, NT_004487.19
UniGene ID	Hs.609663
Ensembl Gene ID	ENSG00000135862
Entrez Gene ID	3915

Assay Information

Unique Assay ID	qHsaCED0044637
Assay Type	SYBR® Green
Detected Coding Transcript(s)	ENST00000258341, ENST00000484114
Amplicon Context Sequence	TGCACCTGGGAAAAGCTTTTGACATCACCTATGTGCGTCTCAAGTTCCACACCAG CCGCCCGGAGAGCTTTGCCATTTACAAGCGCACACGG
Amplicon Length (bp)	62

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Chromosome Location	1:182993261-183072545
Assay Design	Exonic
Purification	Desalted

Validation Results

Efficiency (%)	95
R²	0.9995
cDNA Cq	20.01
cDNA Tm (Celsius)	82
gDNA Cq	24.93
Specificity (%)	100

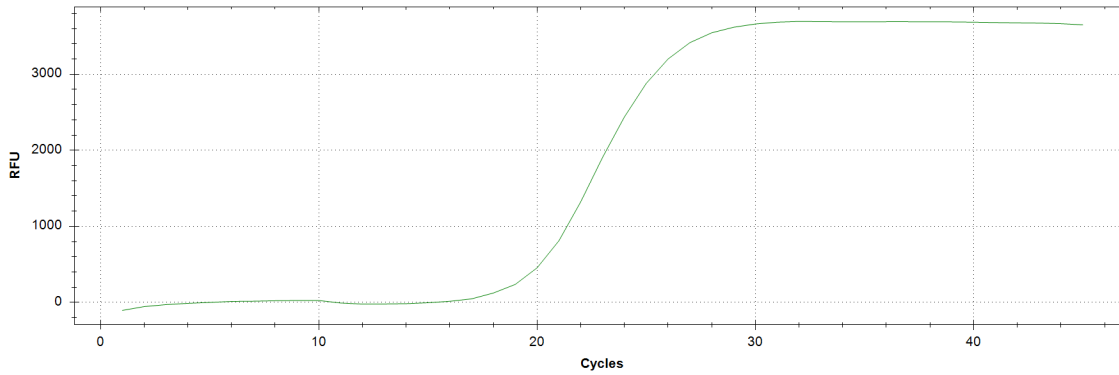
Information to assist with data interpretation is provided at the end of this report.

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LAMC1, Human

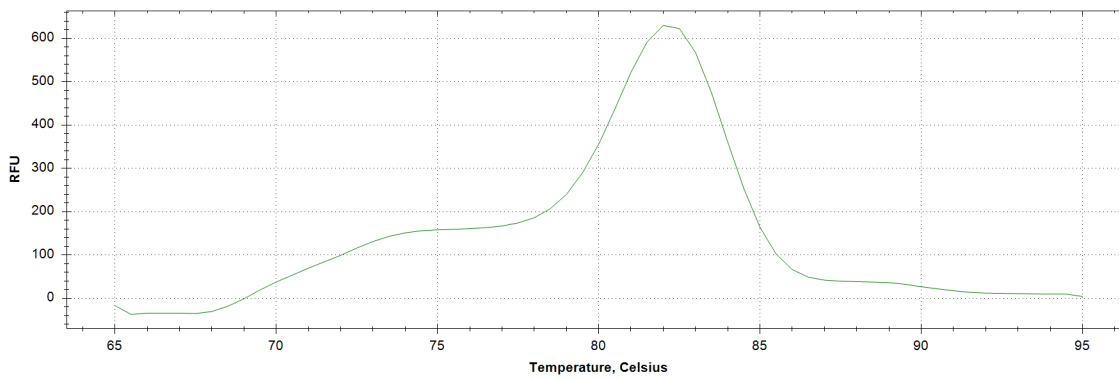
Amplification Plot

Amplification of cDNA generated from 25 ng of universal reference RNA



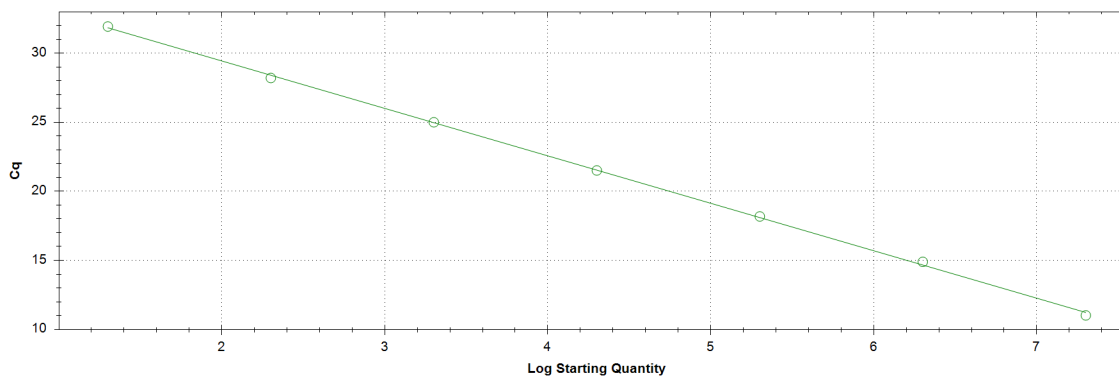
Melt Peak

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>