

Specific and reproducible quantification of long noncoding RNA expression levels

Key highlights

The Applied Biosystems™ TaqMan® Noncoding RNA Assays are:

- Based on proven TaqMan Assay technology
- Available for human, mouse, rat, and numerous other species

Noncoding RNA

Noncoding RNAs (ncRNAs) are RNAs that are transcribed from the genome but not translated into proteins. Although much of the protein-coding portion of the transcriptome has been extensively studied and characterized, ncRNAs represent a largely undiscovered area that has tremendous potential to advance understanding of cell regulatory and disease mechanisms. Some estimates indicate that up to half of all human and mouse transcription may result in noncoding RNAs [1].

Noncoding RNAs have been implicated in a broad variety of cellular functions, including transcriptional regulation, mRNA stability and translation, epigenetic regulation, and assembly of macromolecular complexes. Based upon these functionalities, these ncRNAs can be classified as either regulatory (e.g., miRNA, piRNA, Xist) or structural/housekeeping (e.g., tRNA, snRNA, rRNA). The regulatory ncRNA category can be further subdivided according to ncRNA size. Long ncRNAs are transcripts longer than



200 nucleotides, distinguished from small regulatory RNAs such as miRNAs. The advent of genomic tools to better characterize and profile these long ncRNAs will help elucidate their involvement in cellular regulatory networks and disease etiology.

TaqMan Noncoding RNA Assays

The TaqMan Noncoding RNA Assays enable specific and reproducible quantification of long ncRNA expression levels. These assays are based on proven TaqMan Assay technology, leveraging the existing TaqMan Gene Expression Assay design pipeline to generate gold-standard assays designed to accurately detect ncRNA targets.

Table 1 shows the number of available TaqMan Noncoding RNA Assays for all species currently in our collection. New assays will continually be added.

Assay design and selection

TaqMan Noncoding RNA Assays are designed using algorithms similar to those used for TaqMan Gene Expression Assays.

One of the main differences between the gene expression assays and noncoding RNA assays is that the noncoding assays were designed to only detect noncoding transcript targets. In contrast, gene expression assays are designed to detect one or more coding transcripts of the same gene. Annotation for the noncoding assays comes from NCBI. In addition, to facilitate the microarray verification workflow, we have designed assays for transcripts that target noncoding content, using the Applied Biosystems™ Clariom™ S and D assay platforms.

Workflow

As with the TaqMan Gene Expression Assays collection, TaqMan Noncoding RNA Assays can be used with or without preamplification. Figure 1 shows examples of workflows with recommended master mixes and reagents.

Finding and ordering TaqMan Noncoding RNA Assays

TaqMan Noncoding RNA Assays can be searched for at thermofisher.com/taqman using an interface similar to that of TaqMan Gene Expression Assays. Users can search for noncoding assays, gene expression assays, or all assays (Figure 2). To perform the broadest search possible, we recommend searching all gene expression assays using the RefSeq NR or XR accession number for your ncRNA transcript of interest.

Reference

- Mattick JS (2005) The functional genomics of noncoding RNA. *Science* 309:1527–1528.

Table 1. Available numbers of TaqMan Noncoding RNA Assays.

Species	No. of assays	Species	No. of assays
Human	23,067	Marmoset	361
Mouse	10,214	Rhesus monkey	361
Rat	6,570	Dog	253
Goat	1,235	Pig	242
Cow	478	Mole rat	81
Horse	437	Sheep	71

Total: 43,370 as of February 2019.

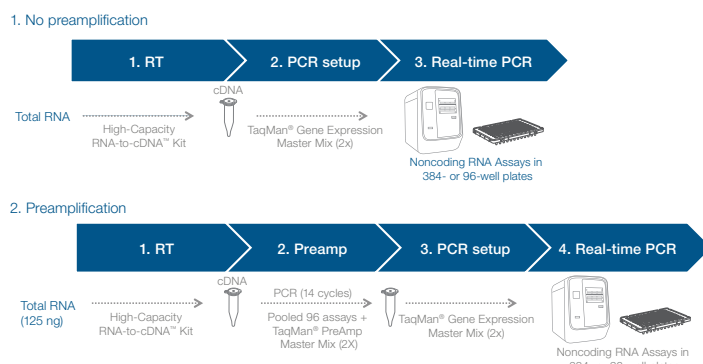


Figure 1. TaqMan Noncoding RNA Assay workflow options.

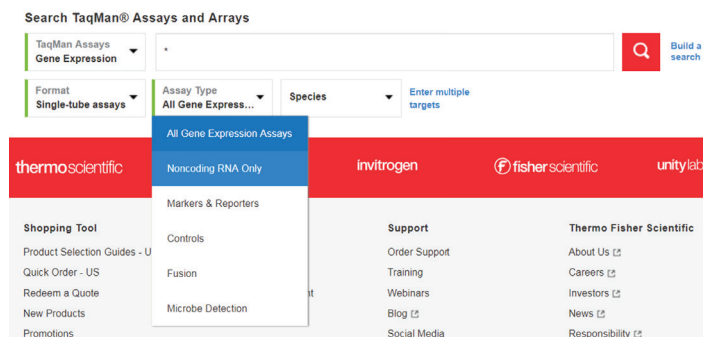


Figure 2. The online search interface for TaqMan Noncoding RNA Assays is similar to that of TaqMan Gene Expression Assays.

Ordering information

Product	No. of 20 μ L reactions	Cat. No.
TaqMan Noncoding RNA Assays	360	4426961
TaqMan Noncoding RNA Assays	750	4426962
TaqMan Noncoding RNA Assays	2,900	4426963

Find out more at thermofisher.com/taqman