



**GeneQuery™ Rat cDNA Evaluation Kit, Deluxe**  
**(GQR-CED)**  
Catalog #GK991R  
*100 reactions*

**Product Description**

ScienCell's GeneQuery™ Rat cDNA Evaluation Kit, Deluxe (GQR-CED) assesses rat cDNA quality. The kit verifies successful reverse transcription of messenger RNA (mRNA) to complementary DNA (cDNA), reveals the presence of rat genomic DNA (gDNA) contamination in rat cDNA samples, and detects qPCR inhibitor contamination. Good quality cDNA is a critical component for successful gene expression profiling. The GQR-CED kit is highly recommended for cDNA applications such as GeneQuery™ qPCR arrays.

Each primer set included in GQR-CED qPCR kit arrives lyophilized in a 2 mL vial. All primers are designed and tested under the same parameters: (i) an optimal annealing temperature of 65°C (with 2 mM Mg<sup>2+</sup>, and no DMSO); (ii) recognition of all known target gene transcript variants; and (iii) specific amplification of only one amplicon. Each primer set has been validated by qPCR by melt curve analysis and gel electrophoresis.

**GeneQuery™ Rat cDNA Evaluation Kit, Deluxe Components**

Cat. No.	Quantity	Component	Amplicon size
GK991Ra	1 vial	Rat Actb cDNA primer set (lyophilized, 100 reactions)	93 bp
GK991Rb	1 vial	Rat Ldha cDNA primer set (lyophilized, 100 reactions)	98 bp
GK991Rc	1 vial	Rat genomic DNA control (RGDC) primer set (lyophilized, 100 reactions)	136 bp
GK991d	1 vial	Positive PCR control (PPC) primer set (lyophilized, 100 reactions)	147 bp
GK991e	8 mL	Nuclease-free H <sub>2</sub> O	N/A

- Rat Actb cDNA primer set targets rat housekeeping gene Actb. For rat cDNA samples, Actb primer set gives an 93 base pair (bp) PCR product.
- Rat Ldha cDNA primer set targets rat housekeeping gene Ldha. For rat cDNA samples, Ldha primer set gives a 98 bp PCR product.
- Rat Genomic DNA Control (RGDC) detects possible rat gDNA contamination in the rat cDNA samples. It contains a primer set targeting a 136 bp non-transcribed region of the genome on rat chromosome 1.

- Positive PCR Control (PPC) tests whether samples contain inhibitors or other factors that may negatively affect gene expression results. The PPC consists of a predisposed synthetic DNA template and a primer set that can amplify it. The sequence of the DNA template is not present in the rat genome, and thus tests the efficiency of the polymerase chain reaction itself.

#### Additional Materials Required (Materials Not Included in Kit)

Component	Recommended
Reverse transcriptase	MultiScribe Reverse Transcriptase (Life Tech, Cat. #4311235)
cDNA template	Customers' samples
qPCR master mix	FastStart Essential DNA Green Master (Roche, Cat. #06402712001)

#### Quality Control

Each primer set is validated by qPCR melt curve and amplification curve analyses. The PCR products are analyzed by gel electrophoresis to confirm single band amplification.

#### Product Use

GQR-CED is for research use only. It is not approved for human or animal use or for application in clinical or *in vitro* diagnostic procedures.

#### Shipping and Storage

This product is shipped at ambient temperature. Upon receipt, the vials should be stored at 4°C and are good for up to 12 months. For long-term storage (>1 year), store the vials at -20°C in a manual defrost freezer.

#### Procedures

**Note:** The primers in each vial are lyophilized.

1. Prior to first use, allow vials to warm to room temperature.
2. Briefly centrifuge at 1,500x g for 1 minute.
3. Add 200 µl of nuclease-free H<sub>2</sub>O to each vial to make primer stock solutions. Aliquot as needed. Store at -20°C in a manual defrost freezer. Avoid repeated freeze-and-thaw cycles.
4. Prepare 20 µl PCR reactions for one well as shown in Table 1.

Table 1

Primer stock solution	2 µl
cDNA template	0.2 – 250 ng
2x qPCR master mix	10 µl
Nuclease-free H <sub>2</sub> O	variable
<b>Total volume</b>	<b>20 µl</b>

**Important:** *Only* use polymerases with hot-start capability to prevent possible primer-dimer formation. *Only* use nuclease-free reagents in PCR amplification.

5. Add the mixture of primer stock solution, cDNA template, 2x qPCR master mix, and nuclease-free H<sub>2</sub>O to each well. Cap or seal the wells.
6. Briefly centrifuge the samples at 1,500x g for 1 minute at room temperature. For maximum reliability, replicates are recommended (minimum of 3).
7. For PCR program setup, please refer to the instructions of the master mix of the user's choice. We recommend a typical 3-step qPCR protocol for a 200nt amplicon:

Table 2. Three-step cycling protocol

Step	Temperature	Time	Number of cycles
Initial denaturation	95°C	10 min	1
Denaturation	95°C	20 sec	40
Annealing	65°C	20 sec	
Extension	72°C	20 sec	
Data acquisition	Plate read		
<i>Recommended</i>	<i>Melting curve analysis</i>		1
Hold	4°C	Indefinite	1

8. (Optional) Load the PCR products on 1.5% agarose gel and perform electrophoresis to confirm the single band amplification in each well.

## Appendix

Table 3. Interpretation of results:

<i>Primers</i>	<i>Results</i>	<i>Interpretation</i>	<i>Suggestions</i>
Actb and Ldha	Both Cq $\geq$ 35	There is no or very low cDNA content in the sample.	Optimize RNA extraction /reverse transcription procedure; make sure there is no nuclease presence in the system
gDNA Control (RGDC)	Cq < 35	The sample is contaminated with gDNA	Optimize RNA extraction procedure
Positive PCR Control (PPC)	Cq > 30	Poor PCR performance; possible PCR inhibitor in reactions; cycling program incorrect	Eliminate inhibitor by purifying samples; use correct cycling program and make sure that all cycle parameters have been correctly entered

Figure 1. A typical amplification curve showing the amplification of a qPCR product.

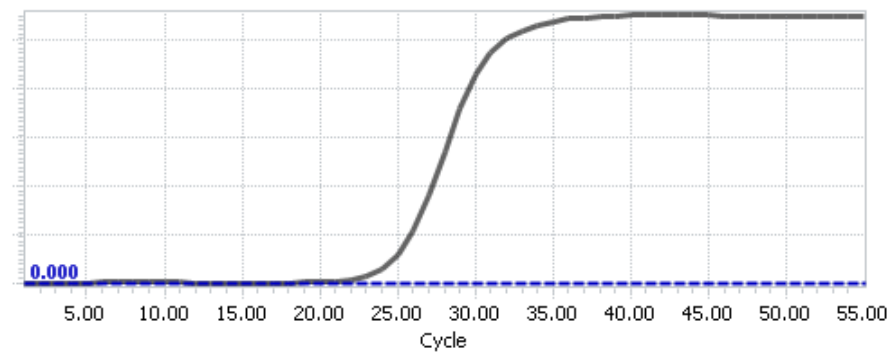


Figure 2. A typical melting peak of a qPCR product.

