

# LightCycler™ -Primer Set

Ready-to-use amplification primer mix for RT-PCR using the LightCycler™ Instrument

## Human GAPDH

Kit for 96 reactions

Lot# 240403 Exp.24.04.2004

**Note:** After Thawing keep on ice!

Store the kit at -20°C

| 1.Kit Contents   |   |                                  |  |   |
|--|---|----------------------------------|--|---|
| <b>caution</b>   | After Thawing keep on ice!  |                                  | <b>Sample material</b>   |   |
| <b>Kit contents</b>  | <b>Vial</b>   | <b>Label</b>                     | <b>Sample Preparation</b>  |   |
|  | 1   | GAPDH Primer mix<br>Yellow cap   |  | ! Reliable and reproducible results are achieved with 1µg total RNA isolated with the HighPure total RNA Isolation Kit (Roche) reverse transcribed with the 1 <sup>st</sup> Strand cDNA Synthesis Kit (AMV) (Roche). <b>The resulting cDNA has to be diluted to a final volume of 200-500 µl with PCR-grade water</b> |
|  | 2   | Standard<br>Red cap              |  |   |
|  | 3   | Standard Stabilizer<br>Green cap |  |   |
|  | 4   | Control cDNA<br>Blue cap         |  |   |
| 5  | H2O, sterile, PCR grade<br>White cap  |                                  |  |   |
| <b>Content and use</b>   | <ul style="list-style-type: none"> <li>• 200 µl ready-to-use primer mix for target specific amplification using the LightCycler™ FastStart Master Sybr Green I contains optimal MgCl<sub>2</sub> concentration and amplification primer pair</li> <li>• 60 µl amplification standard for approximately 473000 copies/µl of GAPDH cDNA</li> <li>• 300 µl Solution for dilution of standard</li> <li>• 50 µl contains a cDNA mix from several human hematopoietic cell lines</li> <li>• 1 ml to adjust the final reaction volume</li> </ul> |                                  |  |   |
| <b>Additional equipment and reagents required</b>  | 1 <sup>st</sup> Strand cDNA Synthesis Kit for RT-PCR (Roche Cat. # 1 483 188)<br>LightCycler™ FastStart Master SybrGreen I (Roche Cat. # 3 003 230)<br>LightCycler™ Instrument (Roche Cat. # 2 011 468)<br>LightCycler™ Primer Set Housekeeping genes (Search GmbH)   |                                  | <b>Application</b>   |   |
| <b>2. Introduction</b>   |   |                                  | <b>Assay time</b>  |   |
| The LightCycler™ -Primer Set allows to perform quantitative RT-PCR using the LightCycler™ instrument. An optimized primer pair has been selected for specific amplification of targets. The amplicon is detected by fluorescence using the double-stranded DNA binding dye Sybr®Green I. |   |                                  | Set up the PCR amplification <b>15 min</b><br>LightCycler™ PCR run <b>50 min</b>   |   |
|  |   |                                  | <b>Number of tests</b>   |   |
|  |   |                                  | The Kit is designed for 96 Reactions   |   |
|  |   |                                  | <b>Quality Control</b>   |   |
|  |   |                                  | The LightCycler™ -Primer Set is tested using the LightCycler™ FastStart Master Sybr®Green I according to the protocol described below.   |   |
|  |   |                                  | <b>Kit storage/ stability</b>  |   |
|  |   |                                  | The unopened kit is stable at -20°C 12 month from date of manufacture  |   |
|  |   |                                  | <b>Specificity</b>   |   |
|  |   |                                  | The LightCycler™ -Primer Set "GAPDH" is specific for the sequence of human GAPDH cDNA. This Primer Set does detect genomic sequences due to the existence of pseudogenes. However, no genomic signal will be generated if RNA or mRNA is generated as directed (DNase treatment). If the sample quality is poor or unknown a no-RT control reaction is strongly recommended. |   |

### 3. Procedure

|                                     |   |
|-------------------------------------|---|
| <b>Introduction</b>                 | A fragment of the human GAPDH cDNA sequence is amplified and monitored with the dsDNA specific Sybr <sup>®</sup> Green I dye  |
| <b>Additional reagents required</b> | LightCycler <sup>™</sup> FastStart Master Sybr <sup>®</sup> Green I (Cat.# 3 003 230)   |
| <b>Thawing the solutions</b>        | Thaw the following reagents, mix gently, and store on ice:<br><br>From the ... Thaw the...  |
|                                     | LightCycler <sup>™</sup> FastStart Master Sybr <sup>®</sup> Green I vial <b>1a/b</b>  |
|                                     | LightCycler <sup>™</sup> Primer Set all tubes   |
| <b>Experimental Protocol</b>        | <p><b>It is recommended to define the experimental protocol before preparing the solutions</b></p> <p>The described protocol consists of four programs.</p> <ul style="list-style-type: none"> <li>• Program 1: Denaturation of the template and activation of the polymerase</li> <li>• Program 2: Amplification of the target</li> <li>• Program 3: Melting curve analysis for product control</li> <li>• Program 4: Cooling the rotor and thermal chamber</li> </ul> |

### Denaturation

| Parameter                    | Value     |
|------------------------------|-----------|
| Cycles                       | 1         |
| Type                         | Regular   |
| Temp. Targets                | Segment 1 |
| Target Temperature           | 95        |
| Incubation time (h:min:s)    | 10:00     |
| Temp. Transition Rate (°C/s) | 20        |
| Secondary Target Temp.       | 0         |
| Step Size                    | 0         |
| Step Delay                   | 0         |
| Aquisition Mode              | None      |

### Amplification

| Parameter                    | Value          |       |        |
|------------------------------|----------------|-------|--------|
| Cycles                       | 35             |       |        |
| Type                         | Quantification |       |        |
| Temp. Targets                | Seg.1          | Seg.2 | Seg.3  |
| Target Temperature           | 95             | 68    | 72     |
| Incubation time (h:min:s)    | 10             | 10    | 16     |
| Temp. Transition Rate (°C/s) | 20             | 20    | 20     |
| Secondary Target Temp.       | 0              | 58    | 0      |
| Step Size                    | 0              | 0.5   | 0      |
| Step Delay                   | 0              | 1     | 0      |
| Aquisition Mode              | None           | None  | Single |
| Gains                        | F1 = 5         |       |        |

### Melting Curve Analysis

| Parameter                    | Value         |        |       |
|------------------------------|---------------|--------|-------|
| Cycles                       | 1             |        |       |
| Type                         | Melting Curve |        |       |
| Temp. Targets                | Seg.1         | Seg. 2 | Seg.3 |
| Target Temperature           | 95            | 58     | 95    |
| Incubation time (h:min:s)    | 0             | 10     | 0     |
| Temp. Transition Rate (°C/s) | 20            | 20     | 0.1   |
| Secondary Target Temp.       | 0             | 0      | 0     |
| Step Size                    | 0             | 0      | 0     |
| Step Delay                   | 0             | 0      | 0     |
| Aquisition Mode              | None          | None   | Cont. |

### Cooling

| Parameter                    | Value     |
|------------------------------|-----------|
| Cycles                       | 1         |
| Type                         | Regular   |
| Temp. Targets                | Segment 1 |
| Target Temperature           | 40        |
| Incubation time (h:min:s)    | 30        |
| Temp. Transition Rate (°C/s) | 20        |
| Secondary Target Temp.       | 0         |
| Step Size                    | 0         |
| Step Delay                   | 0         |
| Aquisition Mode              | None      |

|                                      |   |
|--------------------------------------|---|
| <b>Preparation of the master mix</b> | Depending on the total number of reactions place LightCycler™ capillaries in precooled centrifuge adaptors.<br>It is recommended to use electronic pipettors with high quality tips (low volume retention). Prepare a master mix by multiplying the amount in the “Volume” column by the number of reactions to be analyzed, plus five additional reactions (Standard). |
|--------------------------------------|---|

| Step   | Action   |           |      |                              |           |                                      |           |  |           |                     |                             |
|--|--|-----------|------|------------------------------|-----------|--------------------------------------|-----------|--|-----------|---------------------|-----------------------------|
| 1  | Prepare a fresh dilution series of the standard using the standard stabilizer solution<br>1:10 = 47300 copies/ $\mu$ l<br>1:100 = 4730 copies/ $\mu$ l<br>1:1000 = 473 copies/ $\mu$ l   |           |      |                              |           |                                      |           |  |           |                     |                             |
| 2  | In a 1.5 ml light protected reaction tube on ice, add the following components in the order mentioned below: <table border="1"> <thead> <tr> <th>Component</th> <th>Vol.</th> </tr> </thead> <tbody> <tr> <td>H<sub>2</sub>O (white cap)</td> <td>6 <math>\mu</math>l</td> </tr> <tr> <td>LightCycler™ Primer Set (yellow cap)</td> <td>2 <math>\mu</math>l</td> </tr> <tr> <td>LightCycler™ FastStart DNA Master Sybr® Green I (premixed)</td> <td>2 <math>\mu</math>l</td> </tr> <tr> <td><b>Total Volume</b></td> <td><b>10 <math>\mu</math>l</b></td> </tr> </tbody> </table> | Component | Vol. | H <sub>2</sub> O (white cap) | 6 $\mu$ l | LightCycler™ Primer Set (yellow cap) | 2 $\mu$ l | LightCycler™ FastStart DNA Master Sybr® Green I (premixed) | 2 $\mu$ l | <b>Total Volume</b> | <b>10 <math>\mu</math>l</b> |
| Component  | Vol.   |           |      |                              |           |                                      |           |  |           |                     |                             |
| H <sub>2</sub> O (white cap)                               | 6 $\mu$ l  |           |      |                              |           |                                      |           |  |           |                     |                             |
| LightCycler™ Primer Set (yellow cap)                       | 2 $\mu$ l  |           |      |                              |           |                                      |           |  |           |                     |                             |
| LightCycler™ FastStart DNA Master Sybr® Green I (premixed) | 2 $\mu$ l  |           |      |                              |           |                                      |           |  |           |                     |                             |
| <b>Total Volume</b>  | <b>10 <math>\mu</math>l</b>  |           |      |                              |           |                                      |           |  |           |                     |                             |
| 3  | <ul style="list-style-type: none"> <li>Pipet <b>10 <math>\mu</math>l</b> PCR mix into the precooled LightCycler™ capillary</li> <li>Add <b>10 <math>\mu</math>l</b> of cDNA template</li> </ul>  |           |      |                              |           |                                      |           |  |           |                     |                             |
| 4  | <ul style="list-style-type: none"> <li>Pipet <b>10 <math>\mu</math>l</b> of PCR mix into 4 precooled LightCycler™ capillaries</li> <li>Add <b>10 <math>\mu</math>l</b> of undiluted and of the freshly diluted standards into each capillary</li> </ul>  |           |      |                              |           |                                      |           |  |           |                     |                             |
| 5  | Seal each capillary with a stopper and place the adaptors, containing the capillary, into a benchtop microcentrifuge. Centrifuge at 2000 rpm for 30 s.   |           |      |                              |           |                                      |           |  |           |                     |                             |
| 6  | Place capillaries in the rotor of the LightCycler™ Instrument.   |           |      |                              |           |                                      |           |  |           |                     |                             |
| 7  | Cycle the samples as described above   |           |      |                              |           |                                      |           |  |           |                     |                             |

| Typical results     |   |
|---------------------|---|
| <b>Introduction</b> | The analysis of the obtained data is divided into two parts: <ul style="list-style-type: none"> <li>Part 1: Use of the quantification program, followed by</li> <li>Part 2: Specificity control of the amplification reaction by using the melting curve program</li> </ul> |

|                               |  |
|-------------------------------|--|
| <b>Quantification program</b> | The attached amplification curves in the QC sheet were obtained by performing the described procedure with the enclosed standards and control cDNA. The fluorescence values versus cycle number are displayed. The enclosed control cDNA contains approximately 73000 copies per $\mu$ l of GAPDH specific cDNA  |
| <b>Melting curve program</b>  | Assess the specificity of the amplified PCR product by performing a melting curve analysis. The resulting melting curves allow discrimination between specific and unspecific product. The attached melting curves in the QC sheet display the amplification of the control cDNA. As a negative control, the template was replaced with PCR-grade water. |

c/o Im Neuenheimer Feld 305  
69120 Heidelberg

phone: +49-6221-418 604

Technical Hotline: +49-6221-418 617

Fax: +49-6221-418 608

[www.search-lc.com](http://www.search-lc.com) [info@search-lc.com](mailto:info@search-lc.com)



**GmbH  
Heidelberg**

