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Technical Data Sheet

Takyon™ Rox Probe 5X MasterMix dTTP

UF-RP5X-C0101 • UF-RP5X-C0501 • UF-RP5X-C0505 • UF-RP5X-C0510
[0.6 mL] [5 mL] [5 x 5 mL] [10 x 5 mL]

Emerging from the combination of an optimized reaction buffer and the new efficient «Takyon™» enzyme, Takyon™ kits for Probe Assays ensure sensitivity and fast delivery of accurate and reproducible results!

Kit contents (Table 1)

The kit UF-RP5X-C0501 (UF-RP5X-C0101) contains enough reagents for up to 1250 (150) - 20 µL reactions using the performant hotstart Takyon™ enzyme.

Table 1

Reagent	Volume	Description
5x MasterMix (blue cap)	7.5 ml	Five tube/bottles of 5x reaction mix containing e.g.: – Takyon™ DNA polymerase, – MgCl ₂ (5.5mM final concentration), – dNTPs, – Rox Passive reference, – Stabilizers.
50 mM MgCl ₂ (clear cap)	1.5 ml	50 mM MgCl ₂ solution (optional use)

Storage conditions

For long term storage the Takyon™ Rox Probe 5X MasterMix dTTP should be stored at a temperature between -15 °C and -25 °C in a constant temperature freezer. When stored under these conditions, the components are stable for 24 months. For short term storage the Takyon™ Rox Probe 5X MasterMix dTTP can be stored at 4 °C for 6 months.

Procedure

- 1- Thaw all required reagents completely and put them on ice. Mix all reagents well by inversion and spin them down prior to pipetting.
- 2- Prepare the reaction mix (see Table 2). To correct for dispensing losses, prepare an excess of reaction mix (e.g. a 100-reaction mix for 96 reactions).
- 3- Add all components together, except for the template. Mix thoroughly by pipetting or inversion. Spin down.

Table 2

Component	Volume (µL)	Final Concentration
Takyon™ MasterMix	4	1x
Forward primer	2	50-900 nM ¹
Reverse primer	2	50-900 nM ¹
Probe	2	100-250 nM ¹
Water	7.5	(volume is 20µL minus all other components) ²
Total Mix / reaction	17.5 µL ²	

- 4- Pipette either 2.5 µL of the template cDNA/DNA for your samples or 2.5 µL of the control DNA for your positive control or 2.5 µL of water/buffer for your negative control into your qPCR tubes / plate.

- 5- Add 17.5 µL of the reaction mix per well / vial, close the plate / vial and mix gently on a stirrer and spin down. Ensure that no bubbles are present in the reaction wells / vials. Reaction set up can be done at room temperature.

- 6- The Takyon™ Rox Probe 5X MasterMix dTTP will produce consistent and sensitive results under FAST and REGULAR cycling conditions. Program the Real-Time thermocycler using the following recommended parameters (Table 3):

Table 3

		FAST cycling* - FAST ramping rates! - Only on FAST cycles	Regular Cycling - Regular ramping rates!
	T °C	Time	
Carry over prevention optional**	50 °C**	2 min.	2 min.
Takyon™ activation	95 °C	3 min.	3 min.
40 Cycles			
Denaturation	95 °C	3 sec.	10 sec.
Annealing / extension	60 °C***	20 - 30 sec.	45 - 60 sec.

* Only perform fast cycling on FAST cyclers equipped with a FAST block. Short amplicons (<120 bp) are recommended to support FAST cycling conditions. For longer amplicons or difficult templates, increase the annealing-extension time up to 40 sec.

Example of FAST cyclers: LC480, RotorGenes, ABI 7500 & 7900 with FAST block (optional), ViiA7, ABI StepOne Plus, MasterCycler ep realplex with FAST block (optional),...

** For carryover prevention, add 66µL dUTP/UNG blend (RT-UTP UNG-033) per mL of 5X MasterMix (optional).

*** The annealing temperature will vary depending on the melting temperature (T_m) of the primers.

Note that some FAST thermocyclers can accommodate shorter annealing steps for faster qPCR results. However some assays may require longer extension times for efficient amplification. Increase extension time by increments of 5-second, if required.

Note 1: Primer and probe concentrations of 300 nM & 250 nM, respectively, are recommended as starting concentrations. These concentrations will be correct for many assays, but additional optimization of the primer concentrations and primer-probe ratio may be required to obtain the best results with your primer-probe set (see table 4).

Note 2: 17.5 µL of reaction mix is added to 2.5 µL of template/control DNA prior to cycling, giving a final reaction volume of 20 µL. See steps 4 and 5. These volumes, including primers & probes, can be adjusted depending on the template and reaction volumes.

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Technical information

Primer and probe design guidelines

Probes:

- Avoid runs of identical nucleotides, especially of 4 or more Gs.
- The probe T_m should be 7 to 10 °C above primers T_m.
- Avoid 5'-end G as it quenches the fluorophore.
- For genotyping, the position of the polymorphism should be in the centre of the probes, and the probe length should be adjusted such that each probe has the same T_m.

Primers:

- GC content should be between 30 % and 80 % (ideally 40-60 %).
- Avoid runs of identical nucleotides, especially of 3 or more Gs or Cs at the 3' end.
- The T_m should be between 58 °C and 60 °C.
- The primer should be placed as close as possible to the probe.

Custom assay design

The commonly used concentrations for primers and for probes are 300 nM and 100 nM respectively. Optimal results may require titration of primers and probes or adjustment of the primer / probe ratio. The purpose of such a process is to determine the minimum amount of primers and probe required to obtain the most sensitive results with your assay.

Primer titration matrix

Titrate according to the Table 4, perform qPCR and select the concentration which gives the lowest C_q value. By doing this type of titration it is also possible to compensate for differences up to 2 °C in melt temperature of the primers.

Table 4: Primer titration matrix

Reverse	Forward		
	50 nM	300 nM	900 nM
50 nM	50 / 50	300 / 50	900 / 50
300 nM	50 / 300	300 / 300	900 / 300
900 nM	50 / 900	300 / 900	900 / 900

Primer-probe ratio matrix

Select optimal primer concentration as described in Table 4 and test with all probe concentrations described in Table 5. Select the concentration which gives the lowest C_q value.

Table 5: Primer-probe ratio matrix

Opt. primers conc.	Probe		
	50 nM	100 nM	250 nM

MgCl₂ adjustment matrix

Standard MgCl₂ concentration is 5.5 mM but optimal MgCl₂ concentration can vary between assays. If necessary adjust the MgCl₂ concentration with the provided 50 mM MgCl₂ tube. Always prefer optimizing the primer and probe concentrations before the MgCl₂ concentration.

Adjust the amount of water if MgCl₂ is added to the reaction.

For further information please contact our Customer Help Desk:

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