

COL1A1 SP1 ToolSet™ for LightCycler™ (COL1A1 G2046T, rs1800012)

Lyophilized ToolSet for PCR using the LightCycler™ Instrument. Licensed by Roche Diagnostics GmbH

Order#: COL1A1 SP1 - 16

1 ToolSet for 16 reactions

Store at 4°C, protected from light.
Exposure to light may especially damage
the Oligotool™ tube (vial with red cap).

For use with LightCycler-DNA Master Hybridization Probes, 10 x conc. (Roche Cat.No.: 2 015 102)

1. ToolSet contents

Vial	Label	Content	Quantity
			COL1A1 SP1 - 16
1, Red cap	OligoTool	- lyophilized oligos for PCR - contains mutation detection and anchor probe, primers	For 16 tests Dissolved: 50 µL
2, Green cap	Control	- lyophilized GT heterozygous DNA	Dissolved: 20 µL
3, Blue cap	Solvent	- to dissolve OligoTool / Control	1000 µL of Solvent

Additional equipment and reagents required but not supplied :
LightCycler-DNA Master Hybridization Probes, 10 x conc.Cat.No.: 2 015 102, including 25mM MgCl₂; LightCycler
instrument, LightCycler capillaries, DNA extraction materials

2. Introduction

2.1. Product overview

ToolSet description This ToolSet is specifically designed for genotyping the G2046T polymorphism in the COL1A1 gene (rs 1800012, also known as COL1A1 SP1 polymorphism) by LightCycler PCR with Melting Curve Analysis. Primer pair and fluorescent detection and anchor probes have been optimized for specific amplification of a 196 bp segment containing the potentially mutated site and optimal genotype discrimination.

Control material Heterozygous GT control DNA, lyophilized.

Storage of ToolSet and Solutions Store at +4°C when lyophilized, protected from light. The unopened lyophilized ToolSet is stable at +4°C for 12 months from date of manufacture if protected from light. When dissolved store at +4°C for a maximum of 4 weeks, or at -20°C for longer periods (months), protected from light. Avoid freezing and thawing > 3 times.

3. Preparation for LightCycler PCR

Toolset preparation **Dissolve** the content of the **OligoTool** tube (Red Cap) with **50 µl of Solvent**.
Dissolve the content of the **Control** tube (Green Cap) with **20 µl of Solvent**.

1. Before opening tubes, centrifuge them quickly.
2. Add Solvent into OligoTool tube and Control tube as above.
3. Recap tubes, vortex gently.
4. Before opening tubes, centrifuge them quickly.
5. Proceed to Reaction Mix preparation.

Primers ? You don't have to add primers.
Probes ? You don't have to add probes.

Reaction Mix Preparation For 1 (One) reaction, prepare the Reaction Mix as shown in the following table :

Reagent	µL
OligoTool COL1A1 SP1 -16, dissolved	2.8
Solvent COL1A1 SP1 -16	8
MgCl ₂ 25 mM	3.2 (final 5 mM)
Master Hybridization Probes 10x	2
Total Reaction Mix	16
+ Your DNA or Control COL1A1 SP1 -16	4
Grand Total	20

Use Master Hybridization Probes 10x and MgCl₂ 25 mM from Roche LightCycler-DNA Master Hybridization Probes, 10 x conc. (Roche Cat.No.: 2 015 102, including 25mM MgCl₂).
 For multiple reactions, multiply the indicated volumes appropriately.

Positive Control Always run a positive control with the samples. Use the dissolved COL1A1 SP1 G/T heterozygous Control DNA (Green Cap).

Negative control Always run a negative control with the samples. To prepare a negative control, replace the template DNA with Solvent (Blue Cap).

Extraction of genomic DNA You can use different Kits for DNA isolation, either with a manual method or with an automated system. The elution buffers should be salt-free. Example : Roche High Pure PCR Template Preparation Kit (Cat.No. 1 796 828).

Application The **COL1A1 SP1** ToolSet™ for LightCycler™ allows detection of the **G→T** single nucleotide polymorphism at position 2046 in the COL1A1 gene (rs 1800012). The rarer T allele (also designated as "s" allele) has been associated with increased risk of osteoporosis and bone fracture in comparison with the G allele (also known as "S" allele). [Pubmed : 16580273, 12810179, 10025922]

Note : This ToolSet was developed for use in life science research only.

4. LightCycler Settings and Experimental Protocol

Denaturation

Cycle Program Data	Value
Cycles	1
Analysis Mode	None
Temperature Targets	Segment 1
Target Temperature (°C)	95
Incubation time (s)	30
Temperature Transition Rate (°/s)	20
Secondary Target Temperature (°C)	0
Step Size (°C)	0
Step Delay (Cycles)	0
Acquisition Mode	None

Amplification

Cycle Program Data	Value		
Cycles	50		
Analysis Mode	None		
Temperature Targets	Segment 1	Segment 2	Segment 3
Target Temperature (°C)	95	55	72
Incubation time (s)	5	10	10
Temperature Transition Rate (°/s)	20	20	20
Secondary Target Temperature (°C)	0	0	0
Step Size (°C)	0	0	0
Step Delay (Cycles)	0	0	0
Acquisition Mode	None	Single	None

Melting Curve Analysis

Cycle Program Data	Value		
Cycles	1		
Analysis Mode	Melting Curves		
Temperature Targets	Segment 1	Segment 2	Segment 3
Target Temperature (°C)	95	40	80
Incubation time (s)	30	180	0
Temperature Transition Rate (°/s)	20	20	0.2
Secondary Target Temperature (°C)	0	0	0
Step Size (°C)	0	0	0
Step Delay (Cycles)	0	0	0
Acquisition Mode	None	None	Continuous

Cooling

Cycle Program Data	Value
Cycles	1
Analysis Mode	None
Temperature Targets	Segment 1
Target Temperature (°C)	40
Incubation time (s)	30
Temperature Transition Rate (°/s)	20
Secondary Target Temperature (°C)	0
Step Size (°C)	0
Step Delay (Cycles)	0
Acquisition Mode	None

LC Program Version and Fluorescence Display Mode

Developed with LC Program Version 3.5 and automatic gain control.
For fluorescence display use F2/F1, or preferably F2 with colour compensation.

5. Typical results

Introduction

Use the Melting Curve program to genotype the human genomic DNA research samples. The melting peaks allow discrimination between the possible genotypes of the **G2046T** (SP1) polymorphism in the **COL1A1** gene. Figure 1 shows a typical result obtained with the **COL1A1 SP1 ToolSet™** for LightCycler™ :

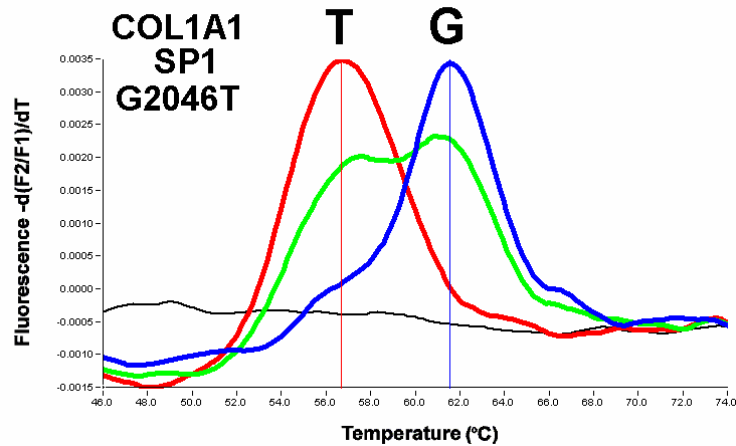


Figure 1 : Melting curve analysis of possible genotypes at position 2046 of the human COL1A1 gene

BLUE : Homozygote **GG2046** DNA (wild type or "SS" genotype)
GREEN : Heterozygote **G2046T** Control DNA contained in the ToolSet ("Ss" genotype),
RED : Homozygote **2046TT** DNA ("ss" genotype)
BLACK : No DNA Control.

Blue Cursor : $T_m = 61.5\text{ }^{\circ}\text{C}$; **Red Cursor :** $T_m = 56.7\text{ }^{\circ}\text{C}$

Conditions : LC program version 3.5 with automatic gain setting, No Color compensation, Digital Filter enabled, Degrees to average : 10.0. Calculation Method : Polynomial.

Note : The values for the respective melting temperatures may vary for +/- 2.5 °C between different experiments. The Delta T between the melting peaks for different genotypes may vary +/- 1.5 °C. The COL1A1 SP1 ToolSet™ has been developed for and validated with the LightCycler™ and its original accessory materials and reagents. Performance of the ToolSet with other instruments, accessories and reagents has not been validated by ratiogen.

7. Notices to Purchaser : Licenses and Trademarks, Prohibition of Resale

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