

## VKORC1 G-1639A ToolSet™ for LightCycler™ (Vitamin K Epoxide Reductase, Oral Anticoagulation, Pharmacogenetics)

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

**Order#: VKORC1 -1639 - 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
			<b>VKORC1 -1639 - 16</b>
<b>1, Red cap</b>	<b>OligoTool</b>	- lyophilized oligos for PCR - contains mutation detection and anchor probe, primers	For 16 tests Dissolved: 50 µL
<b>2, Green cap</b>	<b>Control</b>	- lyophilized heterozygote DNA	Dissolved: 20 µL
<b>3, Blue cap</b>	<b>Solvent</b>	- 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 MgCl<sub>2</sub>;  
LightCycler instrument, LightCycler capillaries, DNA extraction materials

### 2. Introduction

#### 2.1. Product overview

**ToolSet description** This ToolSet is specifically designed for genotyping the G-1639A mutation in the VKORC1 gene by LightCycler PCR with Melting Curve Analysis. The primer pair and fluorescent detection and anchor probes have been optimized for specific amplification of a 135 bp segment containing the potentially mutated site and optimal genotype discrimination.

**Control material** Heterozygote 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. Preparation for LightCycler PCR

**Toolset preparation** **Dissolve** the content of the **OligoTool** tube (Red Cap) with **50 ml of Solvent**.  
**Dissolve** the content of the **Control** tube (Green Cap) with **20 ml 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 VKORC1 -1639 -16, dissolved	2.8
Solvent VKORC1 -1639 -16	10.4
MgCl <sub>2</sub> 25 mM	0.8 (final 2 mM)
Master Hybridization Probes 10x	2
Total Reaction Mix	16
+ Your DNA or Control VKORC1 -1639 -16	4
Grand Total	20

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

**Positive Control** Always run a positive control with the samples. Use the dissolved VKORC1 G-1639A 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 **VKORC1 gene** encodes Vitamin K epoxide reductase subunit 1 which is the molecular target of coumarins commonly employed for oral anticoagulation. The **VKORC1 G-1639A** ToolSet™ for LightCycler™ allows detection of the **G→A** mutation at position -1639 in the VKORC1 gene promoter causing about 30 % drop in transcription of the VKORC1 gene. The VKORC1 -1639A mutation is part of the VKORC1\*2 haplotype associated with enhanced sensitivity to coumarins.

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	<b>Segment 1</b>
Target Temperature (°C)	95
Incubation time (s)	60
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	<b>50</b>		
Analysis Mode	None		
Temperature Targets	<b>Segment 1</b>	<b>Segment 2</b>	<b>Segment 3</b>
Target Temperature (°C)	95	55	72
Incubation time (s)	10	10	10
Temperature Transition Rate (°/s)	20	20	<b>3</b>
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	<b>Segment 1</b>	<b>Segment 2</b>	<b>Segment 3</b>
Target Temperature (°C)	95	<b>40</b>	<b>85</b>
Incubation time (s)	60	60	0
Temperature Transition Rate (°/s)	20	20	0.1
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	<b>Segment 1</b>
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

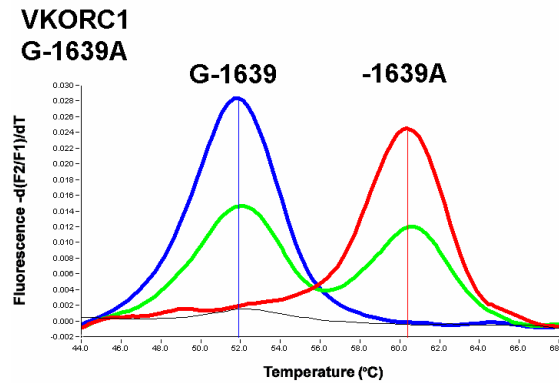
##### LC Program Version and Fluorescence Display Mode

Developed with LC Program Version 3.5 and automatic gain control.  
For fluorescence display use F2/F1, or 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 at the **G-1639A** mutation site in the **VKORC1** gene. Figure 1 shows a typical result obtained with the **VKORC1 G-1639A ToolSet™** for LightCycler™ :



**Figure 1 : Melting curve analysis of genotypes at position -1639 of the human VKORC1 gene**

**BLUE :** Homozygote **GG -1639** (wild type)  
**GREEN :** Heterozygote **G-1639A** (Control DNA contained in the ToolSet)  
**RED :** Homozygote **-1639AA**  
**BLACK :** No DNA Control.

**Blue Cursor :**  $T_m = 51.9\text{ }^\circ\text{C}$  ; **Red Cursor :**  $T_m = 60.4\text{ }^\circ\text{C}$

Conditions : LC program version 3.5 with automatic gain setting, No Color compensation, Digital Filter enabled, Degrees to average : 8.0. Calculation Method : Polynomial.

**Note :** The values for the respective melting temperatures may vary for  $\pm 2.5\text{ }^\circ\text{C}$  between different experiments. The Delta T between the melting peaks for different genotypes may vary  $\pm 0.5\text{ }^\circ\text{C}$ . The VKORC1 G-1639A 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 Genes-4U.

## 7. Notices to Purchaser

### Licenses and Trademarks, Prohibition of Resale

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