



## EliGene<sup>®</sup> Coeliac-28 RT (DQ2, DQ8)

**REF** 90048-RT28 (for 50 samples)

### *Kit components:*

5 x 180 µl CELIDQ2 Mix  
5 x 180 µl CELIDQ8SYN Mix  
2 x 50 µl PC CELI  
Instruction for Use

### *Storage and shelf life after first opening:*

All components of the kit must be transported and stored at -20 °C. Kit and remaining MasterMixes must be stored at -20 °C in a dark.

### *Intended use*

EliGene<sup>®</sup> Coeliac-28 RT is intended for the genotyping of HLA-DQ2 (DQA1\*05/DQB1\*02) and DQ8 (DQB1\*0302) genes from isolated DNA.

### *Principle of the method*

This diagnostic kit is based on RealTime PCR method. In this kit primers and labeled probes (FAM and JOE) for the detection of DQ2 and DQ8 alleles and for the detection of internal control are used.

### *Introduction*

Celiac disease, also called celiac sprue is one of the most common enteropathogenic disorders and is characterized by a lifelong hypersensitivity to gluten proteins found in wheat, rye, oat and barley. Celiac disease does not belong to allergic disease but it is characterized by intolerance to gliadin forming parts of gluten. In early childhood the immunological intolerance to gliadin, leads to a chronic inflammatory response in the small-intestinal mucosa and subsequent malabsorption characterized by chronic diarrhea, steatorrhea and failure to thrive. Many adult patients can also show other atypical signs such as, abdominal distention, weight loss, fatigue, skin- and joint problems or migraine-like headache. Indeed, others may remain largely asymptomatic. Non-treated celiac disease increases the risk of NHL (non-Hodgkin's lymphoma) and probably small-intestinal cancer.

Until recently, celiac disease was considered relatively uncommon with an estimated prevalence rate ranging from 1 in 1000 to 1:4000. However, the availability of new serologic tests have led to the observation that celiac disease is much more common, affecting about 1 of 100-400 persons in Europe, the majority of patients showing little clinical symptoms. Considerable evidence now indicates that celiac disease has a strong genetic component.



Celiac disease is a multifactorial disorder associated with HLA-DQ2 (DQA1\*05/DQB1\*02) or DQ8 (DQA1\*0301/DQB1\*0302) or HLA-DRB1\*04. HLA DQ2 is expressed in the majority (> 90%) of those with celiac disease and DQ8 in about 8%. The expression of these HLA-DQ2 or DQ8 molecules is necessary but not sufficient to develop celiac disease and accounts for only about 50% of the genetic component of the disease. Studies in sibling (sib recurrence risk for celiac disease of 10%) and of identical twins (concordance of 70%) suggest that the contribution of HLA genes in celiac disease is less than 50%. About 95% of all celiac patients possess this particular genotype compared to approximately 20% of the normal population. Of the few celiac patients who are negative for HLA-DQ2 (DQA1\*05/DQB1\*02), a great majority are HLA-DQ8 positive. From this point of view absence of these alleles is useful in excluding celiac disease. However, at least one other non-HLA gene and some environmental factors are also likely to be involved in the disease.

EliGene® Coeliac-28 RT kit detects genes DQA1\*05, DQB1\*02 and DQB1\*0302. As an internal control the gene SYPL2 (synaptophysin-like 2) is used.

### Primary sample collection, handling and storage

Clinical material:	Recommended DNA isolation procedure:
Blood	Manual: EliGene Urine Isolation Kit (ELISABETH PHARMACON) Automatic: <b>ZEPHYRUS Magneto</b> (ELISABETH PHARMACON)
Swabs	Manual: EliGene Urine Isolation Kit (ELISABETH PHARMACON) Automatic: <b>ZEPHYRUS Magneto</b> (ELISABETH PHARMACON)

#### Blood:

##### Manual isolation:

Add 10 µl of Proteinase K to the sample and then continue according to the standard protocol of EliGene Urine Isolation Kit (ELISABETH PHARMACON) for DNA isolation from blood. Isolated DNA use immediately for the detection or store it hours to one week at 4 °C or freeze DNA at -20 °C for longer period than one week.

##### Automatic isolation:

Isolate DNA from the sample by using MAGNETO BodyFluid DNA/RNA isolation kit according to protocol for blood samples with elution to 50 µl of Elution buffer.

#### Swabs:

These specimens should be collected according to standard protocol in collection tubes. Specimens should be transported to the laboratory at 4 °C. For the diagnostic purposes, it is necessary to isolate DNA from the sample during the day of taking.

##### Manual isolation:

1. Into 2.0 ml tube pipette 400 µl of MI3 solution and 20 µl of Proteinase K.
2. Put the swab into the 2.0 ml tube and with sterile scissor cut the swab – cut about 0.5 cm above the swab. Close the tube.
3. Incubate tube 20 minutes at 56 °C in thermo shaker at 1000 rpm. Consequently shortly spin the tube.
4. By sterile pincers remove the swab and add 330 µl of solution MI4 to lysate. Vortex and shortly spin.
5. Continue according to the standard protocol of EliGene Urine Isolation Kit. Isolated DNA use immediately for the detection or store it hours to one week at 4 °C or freeze DNA at -20 °C for longer period than one week.



#### *Automatic isolation:*

1. Into 2.0 ml tube pipette 450 µl of Lysis buffer, 200 µl of PCR water and 10 µl of Proteinase K.
2. Put the swab into the 2.0 ml tube and with sterile scissor cut the swab – cut about 0.5 cm above the swab. Close the tube.
3. Incubate tube 20 minutes at 56 °C in thermo shaker at 1000 rpm. Consequently shortly spin the tube.
4. By sterile pincers remove the swab, vortex and shortly spin.
5. Pipette all volume of sample to position H at Deep well plate from MAGNETO BodyFluid DNA/RNA isolation kit.
6. Isolate DNA from the sample by using MAGNETO BodyFluid DNA/RNA isolation kit according to protocol for plasma samples with elution to 50 µl of Elution buffer.

Recommended concentration of analyzed DNA is 1–10 ng/µl. It is not recommended to test samples at lower concentration than 1 ng/µl.

#### **Additional required equipment**

- Automatic pipette 5–20 µl and sterile tips with filter DNA-, RNA- free, DNase-, RNase- free (we recommended plastic with CE certificate for diagnostic purposes).
- Sterile stand DNA-, RNA- free, DNase-, RNase- free.
- Equipment for RealTime PCR – the kit is designed for RealTime Systems ABI 7000, 7300, 7500 (Applied Biosystems), LightCycler 480 and LightCycler Nano (Roche), RotorGene 6000 or RotorGene Q (Qiagen).
- Sterile plastic (strips, plates, tubes) DNase-, RNase- free compatible with given RealTime PCR system.
- Lab safety gloves.

#### **Configuration of Real Time instrument**

- For DQA1\*05 and DQB1\*0302 alleles detection the probes labeled with FAM are used (exc. 494 nm – em. 518 nm).
- For DQB1\*02 allele and gene SYPL2 (internal control) detection the probe labeled with JOE is used (exc. 520 nm – em. 548 nm).
- Reaction Mix includes passive reference control dye ROX for signal normalization.

#### **RealTime Systems ABI 7000, 7300, 7500FAST (Applied Biosystems):**

Use the program module for absolute quantification (Plate Type “Absolute Quantification” for ABI 7300, “Quantitation-Standard Curve” experiment for ABI 7500FAST). In case of ABI7500FAST use “7500 (96wells)” instrument type.

#### **Set up the following temperature profile:**

##### *Holding stage*

95°C 3 min

##### *Cycling stage – 40 cycles*

95°C 15 s

60°C 40 s Data collection ON

Collect emission signal at the second step – 60 °C.



The complete temperature profile can be up-loaded from Run Template "CELI\_RT\_ABI7300\_v02.sdt" or "CELI\_RT\_ABI7500\_v01.edt". The Run Template can be copied from the CD included in the kit.

### **LightCycler® 480 (Roche):**

For reaction use white plates only. The usage of natural plates can lead to decreased sensitivity of the kit. Do not reuse plates; the contamination of your laboratory could occur during the manipulation with plates.

In option Detection format choose "Dual Color Hydrolysis probe".

#### **Set up the following temperature profile:**

##### *Step 1 - Analysis mode "None", 1 Cycle*

95°C	3 min	Ramp rate (4.4°C/s)	Acquisition mode "None"
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##### *Step 2 - Analysis mode "Quantification", 40 cycles*

95°C	15 s	Ramp rate (4.4°C/s)	Acquisition mode "None"
60°C	40 s	Ramp rate (2.2°C/s)	Acquisition mode "Single"

##### *Step 3 - Analysis mode "None", 1 Cycle*

40°C	1 min	Ramp rate (2.2°C/s)	Acquisition mode "None"
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The complete temperature profile can be up-loaded from Run Template "CELI\_RT\_LC480\_v02.ixi". The Run Template can be imported to the software in menu "Navigator" by clicking to icon "Import" from the CD included in the kit.

### **LightCycler® Nano (Roche):**

For reaction use clear strips only.

In "Run Settings" menu choose "Hydrolysis Probes" option and "High Quality" option.

#### **In "Profile menu" set up the following temperature profile:**

##### *Step 1 - Hold*

95°C	3 min	Ramp rate (5°C/s)
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##### *Step 2 – 2-Step Amplification, 40 cycles*

95°C	15 s	Ramp rate (5°C/s)	
60°C	40 s	Ramp rate (4°C/s)	"Acquire" signal

##### *Step 3 - Hold*

40°C	1 min	Ramp rate (4°C/s)
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In "Samples" menu click in window "Targets" (upper right window) on icon "+" and choose FAM dye as "Target 1". Then click once again on icon "+" and choose HEX dye as "Target 2". In window "Samples" (upper left window) click on icon "+" and add your samples. Then assign the samples with positions and Targets FAM and HEX as an Unknown sample (Samples).

The complete temperature profile can be up-loaded from Run Template "CELI\_RT\_LCNANO\_v02.ppf". The Run Template can be copied from the CD included in the kit.

### **RotorGene 6000 or Q (Qiagen):**

In the "New Run" window choose "Two Step" run

Choose the appropriate "Rotor Type" and click "Next".

**Set up the following temperature profile:***Holding stage*

95°C 3 min

*Cycling stage – 40 cycles*

95°C 15 s

60°C 40 s Acquiring in channels “Green” and “Yellow”

The complete temperature profile can be up-loaded from Run Template “CELL\_RT\_RG6000\_v02.ret”. The Run Template can be copied from the CD included in the kit.

**Reagent preparation**

- To avoid the contamination keep all tubes closed and follow the instructions.
- Before the usage, all reagents must be completely thawed, briefly mix on vortex and shortly spin.
- Isolate DNA according to standard protocol.

**Preparation of Reaction Mix**

**WARNING:** The contamination in laboratory space is also possible. Use separate pipette for MasterMixes, separate pipette for positive controls and separate pipette for samples. Follow all recommendations for laboratories of DNA analyses.

1. Detection: Take one microtube with CELIDQ2 Mix and one microtube with CELIDQ8SYP Mix and after the thawing pipette 17.5 µl of each Mix to separate amplification microtube. Thereafter add 2.5 µl of isolated DNA to each microtube. During the pipetting of samples be careful to avoid cross-contamination of samples. If you do not use all the volume of MasterMix, freeze it and store at -20 °C in a dark. Do not freeze tubes with MasterMix repeatedly. Under these conditions it is stable at least for 14 days.
2. Positive control: Take one microtube with CELIDQ2 Mix and one microtube with CELIDQ8SYP Mix and after the thawing pipette 17.5 µl of each Mix to amplification microtube and add 2.5 µl of Positive Control PC CELL.

Insert the microtubes or plate with samples to the RealTime PCR instrument and run the program according to chapter “Configuration of Real Time instrument” above.

**Result viewing****RealTime Systems ABI 7000, 7300, 7500FAST (Applied Biosystems):**

In “Analysis Settings” choose “Automatic Threshold” and “Automatic Baseline” option and analyze results.

Positive result: The positive results are characterized by amplification and growth of signal in FAM channel (em. 518 nm) and in JOE channel (em. 548 nm). In a case of negative results the amplification will not occur.

The values of Qty correspond to the quantity of positive result, “result undet.” means negative result. Positive result is characterized by increasing of fluorescence signal in given channel.

**LightCycler® 480 (Roche):**

In menu “Analysis” choose “Abs Quant/2nd Derivative Max” option.

In Analysis window click to “Color Comp” icon and choose Universal CC FAM (510)-HEX (580) calibration.



Analyze results by clicking to icon “Calculate”.

Positive result: The positive results are characterized by amplification and growths of signal in FAM channel (465-510) and in JOE channel (533-580). In a case of negative results the amplification will not occur.

The values of Concentration correspond to the quantity of positive result; “Negative” means negative result. Positive result is characterized by increasing of fluorescence signal in selected channel.

### **LightCycler<sup>®</sup> Nano (Roche):**

In “Analysis” menu click in window “Select Analysis” on icon “+” and choose “Automatic Quantification”.

Positive result: The positive results are characterized by amplification and growths of signal in FAM channel (510-528) and in JOE channel (530-548). In a case of negative results the amplification will not occur.

The values of Concentration correspond to the quantity of positive result; “Negative” means negative result. Positive result is characterized by increasing of fluorescence signal in selected channel.

### **RotorGene 6000 or Q (Qiagen)- version 1.7 and higher:**

Click to “Analysis” icon in the menu and choose Analysis option “Quantitation”. In “Quantitation Analysis” window choose “Dynamic Tube” and “Slope Correct” option.

Positive result: The positive results are characterized by amplification and growth of signal in FAM channel (Green) and in JOE channel (Yellow). In a case of negative results the amplification will not occur.

The values of “Calc. conc.” correspond to the quantity of positive result; “Negative” means negative result. Positive result is characterized by increasing of fluorescence signal in given channel.

## **Interpretation of results**

### **HLA-DQ2 (DQA1\*05/DQB1\*02) positive**

If the increasing of amplification signal in CELIDQ2 Mix appears in both channels, FAM (DQA1\*05) and JOE (DQB1\*02), before the cycle number 35.

### **HLA-DQ2 (DQA1\*05/DQB1\*02) negative**

If the increasing of amplification signal in CELIDQ2 Mix does not appear in both channels, FAM (DQA1\*05) and JOE (DQB1\*02), before the cycle number 35. The signal in CELIDQ8SYP Mix in JOE channel for the internal control (SYPL2) must be positive.

Important notice: For HLA-DQ2 positivity it is necessary to have positivity for both alleles, DQA1\*05 and DQB1\*02. If only one allele is present the patient is not HLA-DQ2 positive.

### **HLA-DQ8 (DQB1\*0302) positive**

If the increasing of amplification signal in CELIDQ8SYP Mix appears in FAM channel (DQB1\*0302) before the cycle number 35 and at the same time difference of Ct values between the signal in FAM channel (DQB1\*0302) and the signal in JOE channel (SYPL2) is not higher than 4. The signal in CELIDQ8SYP Mix in JOE channel for the internal control (SYPL2) must be positive.



### HLA-DQ8 (DQB1\*0302) negative

If the increasing of amplification signal in CELIDQ8 Mix does not appear in FAM channel (DQB1\*0302) before the cycle number 35 or the difference of Ct values between the signal in FAM channel (DQB1\*0302) and signal of JOE channel (SYPL2) is higher than 4.

The following table summarizes the results showing a genetic predisposition for coeliac disease.

Genotype	CELIDQ2 Mix		CELIDQ8SYP Mix	
	FAM DQA1*05	JOE DQB1*02	FAM DQB1*0302	JOE IC (SYPL2)
DQ2	+	+	-	+
DQ8	+	-	+	+
DQ8	-	+	+	+
DQ8	-	-	+	+
DQ2/DQ8	+	+	+	+

### Positive result:

DQ2, DQ8 or both alleles were detected in sample.

**WARNING:** The contamination in laboratory space is also possible. Use separate pipette for MasterMixes, separate pipette for positive controls and separate pipette for samples. Follow all recommendations for laboratories of DNA analyses.

### Inhibited sample:

If the amplification signals in CELIDQ2 and CELIDQ8SYP Mixes in both channels FAM, JOE are not observed. In this case it is necessary to repeat the analysis. The best is to use DNA samples prepared by new DNA isolation.

### Control procedure

EliGene® Coeliac-28 RT kit detects as an internal isolation control the human gene *SYPL2* (synaptophysin-like 2) in CELIDQ8SYP Mix in JOE channel. *SYPL2* gene is present in each human DNA sample, so it is not necessary to add internal control to the sample. Internal isolation control follows the quality of DNA isolation and detects mistakes in the isolation process. It detects the occurrence of an inhibition of amplification process. In the case that the sample is DQA1\*05/DQB1\*02 and DQB1\*0302 negative, the Ct of internal control must be Ct < 40.

### Reference material:

To monitor the all examination process covering DNA isolation and RealTime PCR detection is possible to use reference material positive for DQ2 and DQ8 alleles. The commercial positive material is not available.

### Troubleshooting:

1. If there is no amplification of Internal Control, there is some problem in the isolation of DNA or the kit is after the expiration date or there is RealTime instrument breakdown.
2. If there is no amplification of Positive Control, the kit is after the expiration date or there is RealTime instrument breakdown.





## Performance characteristics

### Analytical performance characteristics:

EliGene® Coeliac-28 RT kit is specific for detection of gene DQA1\*05, DQB1\*02 and DQB1\*0302 alleles. The kit detects human genomic DNA of concentration higher than 5 ng/μl added to the amplification mix.

**Analytical sensitivity** is 10 ng of DNA in reaction mix.

**Analytical specificity** of method is 100%. Analytical specificity of the method was validated by searching in the DNA databases.

**Clinical specificity** EliGene® Coeliac-28 RT kit specificity was tested on 50 samples of human DNA with genotypes determined by DNA sequencing.

### Diagnostic performance characteristics:

EliGene® Coeliac-28 RT kit specificity was tested on 50 samples of human DNA with genotypes determined by DNA sequencing. Totally 50 samples were right determined by EliGene® Coeliac-28 RT kit.

The clinical specificity of EliGene® Coeliac-28 RT kit is 100%.

## Measuring interval

The kit enables the detection of ≥ 10 ng DNA molecules in reaction mix.

## Internal control of quality

As an internal control of quality the Internal Control for checking the process of DNA isolation together with Positive Control for functional control of MasterMix and as a reference sample is used.

## Limitation of the examination procedure

The sensitivity of kit depends on handling with specimen (isolation of DNA). It is strictly recommended to use isolation kits and procedures mentioned above.

## Biological reference intervals

Not applicable information for this kit.

## Warning

Unused content of the tube with MasterMix is stable for 2 weeks at -20 °C. Do not freeze tubes with MasterMix repeatedly! Do not mix components of the kits of different lots.

### Warnings and general precautions

- Handle and dispose of all biological samples as if they were capable of transmitting infective agents. Avoid direct contact with the biological samples. Avoid splashing or spraying. The materials that come into contact with biological samples must be treated with 3% sodium hypochlorite for at least 30 minutes or autoclaved at 121 °C for one hour before disposal.





- Handle and dispose of all reagents and all assay materials as if they were capable of transmitting infective agents. Avoid direct contact with the reagents. Avoid splashing or spraying. Waste must be treated and disposed of in compliance with the appropriate safety standards. Disposable combustible materials must be incinerated. Liquid waste containing acids or bases must be neutralized before disposal.
- Wear suitable protective clothing and gloves and protect eyes/face.
- Never pipette solutions by mouth.
- Do not eat, drink, smoke or apply cosmetic products in the work areas.
- Wash hands carefully after handling samples and reagents.
- Dispose of leftover reagents and waste in compliance with regulations in force.
- Read all the instructions provided with the kit before running the assay.
- Follow the instructions provided with the kit while running the assay.
- Do not use the kit after the expiry date.
- Only use the reagents provided in the kit and those recommended by the manufacturer.
- Do not mix reagents from different batches.
- Do not use reagents from other manufacturer's kit.

### **Warnings and precautions for molecular biology**

- Molecular biology procedures, such as extraction, reverse transcription, amplification and detection of nucleic acids, require qualified staff to prevent the risk of erroneous results, especially due to degradation of the nucleic acids contained in the samples or due to sample contamination by amplification products.
- It is necessary to have separate areas for the extraction/preparation of amplification reactions and for the amplification/detection of amplification products. Never introduce an amplification product in the area designed for extraction/preparation of amplification reactions.
- It is necessary to have lab coats, gloves and tools which are exclusively employed in the extraction/preparation of amplification reactions and for the amplification/detection of amplification products. Never transfer lab coats, gloves or tools from the area designed for the amplification/detection of amplification products to the area designed for the extraction/preparation of the amplification reactions.
- The samples must be exclusively employed for this type of analysis. Samples must be handled under a laminar safety box. Tubes containing different samples must be never opened at the same time. Pipettes used to handle samples must be exclusively employed for this specific purpose. The pipettes must be of the positive displacement type or be used with aerosol filter tips. The tips employed must be sterile, free from DNases and RNases, free from DNA and RNA.
- Reagents must be handled under PCR box or laminar flow box. The reagents required for amplification must be prepared in such a way that they can be used in a single session. The pipettes employed to handle the reagents must be used exclusively for this purpose. The pipettes must be of the positive displacement type or be used with aerosol filter tips. The tips employed must be sterile, free from DNases and RNases, free from DNA and RNA.
- Amplification products must be handled in such way as to reduce dispersion into the environment as much as possible, in order to avoid the possibility of contamination. Pipettes used to handle amplification products must be employed exclusively for this specific purpose.



### Warnings and precautions specific to components of the kit

- The tubes containing mixes (CELIDQ2 Mix and CELIDQ8SYP Mix) are disposable and therefore must be used once only in the preparation of the reaction mixture.
- These mixes carry the following safety warnings (P):

**P280** Wear protective gloves/protective clothing/eye protection/face protection.

**P281** Use personal protective equipment as required.

### Literature

Bourgey M, Calcagno G, Tinto N, Gennarelli D, Margaritte-Jeannin P, Greco L, Limongelli MG, Esposito O, Marano C, Troncone R, Spampinato A, Clerget-Darpoux F, Sacchetti L. (2007) HLA related genetic risk for coeliac disease. *Gut*. 56(8):1054-9

Margaritte-Jeannin P, Babron MC, Bourgey M, Louka AS, Clot F, Percopo S, Coto I, Hugot JP, Ascher H, Sollid LM, Greco L, Clerget-Darpoux F. (2004) HLA-DQ relative risks for coeliac disease in European populations: a study of the European Genetics Cluster on Coeliac Disease. *Tissue Antigens* 63(6):562-7.



## Symbols



Catalog number



Upper limit of temperature



Batch code



Use by (last day of month)



*in vitro* diagnostic medical device



Fulfilling the requirements of European Directive 98\79\EC for *in vitro* diagnostic medical device.



Contains sufficient for "N" tests



Attention, consult instructions for use



Manufacturer

## Manufacturer

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