DNK s.r.o.
diagnostické centrum

Laboratory diagnosis of genetic resistance to hepatitis C virus

Diagnostic kit for the detection of SNP polymorphism in the gene encoding Interleukin 28B (IL28B)

One of the main causes of chronic liver disease is the hepatitis C virus (HCV), which infects between 130 and 170 million people (2-3% of the world's population). Acute hepatitis C results in self-healing in 20-30% of cases, but in 50-80% of infected individuals, the disease progresses into a chronic infection and can lead to cirrhosis of the liver and hepatocellular carcinoma.

To prevent adverse consequences of chronic hepatitis C, antiviral therapy with **pegylated interferons in combination with ribavirin** is often used. To achieve a sustained virological response characterised by the absence of HCV RNA in patients' blood 24 weeks after discontinuation of treatment, treatment should last 24 to 48 weeks. Long-term combination antiviral therapy can lead to the development of a number of negative side effects, and therefore treatment is discontinued in 10–14% of cases.

When choosing a therapy, the prognosis of treatment effectiveness, the likelihood of achieving a lasting virological response and the risk of side effects are of great importance. This may help determine genetic determinants of response to treatment in patients with chronic hepatitis C.

It was found that changes in the cluster of genes IL28A, IL28B and IL29 are among the factors that determine the features of the antiviral defenses of the human body. The most important SNPs are in the area adjacent to the IL28B gene: rs12979860 C/T and rs8099917 T/G. Their detection has the greatest diagnostic value in the treatment of chronic hepatitis C caused by HCV genotype 1.

Clinical significance of detection of SNP in IL28B gene

- The IL28B gene encodes interferon-λ3 triggering a cascade that blocks viral protein synthesis and thus determines the body's antiviral defense properties.
- Polymorphism rs12979860 C/T is the substitution of cytosine (C) for thymine (T) and polymorphism rs8099917 T/G is the substitution of thymine (T) for guanine (G) in the regulatory region of gene IL28B
- These SNPs are associated with genetic resistance to viral infections and the effectiveness of interferon/ribavirin complex treatment of chronic hepatitis C, which determines the likelihood of spontaneous elimination of the virus and the level of response to combination antiviral therapy.
- Testing is intended to predict the outcome of the disease before starting treatment for chronic hepatitis C to choose the method of treatment.

Diagnostic kit RealBest-Genetics Interleukin 28B (Cat. No. 3811)

- It is designed to determine the SNP rs12979860 C/T and rs8099917 T/G of the interleukin 28B (IL28B) gene
- The principle of SNP detection is based on amplification of a selected fragment of human DNA and subsequent detection of melting curves of hybrid complexes of PCR products and specific probes with fluorescent tag

Features and advantages of the diagnostic kit

- **Ready Master Mix for PCR**: Simplification of analysis procedures and high stability of test quality
- The duration of the analysis is **80-90 minutes**, the interpretation of results with genotype identification takes place automatically
- **Specimens**: whole blood or buccal epithelium
- **Devices: CFX96** (BioRad, USA), **Gentier 96E/R** (Xi´an TianLong, Science and Technology Co., Ltd,. China)
- **High stability of the kit**: storage of all components at 2–8 °C for max. 12 months; transport up to 26 °C not more than 10 days

Interpretation of analysis results

SNP	Genotype	Mutation effect
rs12979860 C/T	C/C	Increased likelihood of a positive response with antiviral therapy Increased likelihood of spontaneous elimination of HCV
	C/T	Reduced likelihood of effective antiviral therapy
	T/T	Low probability of effective antiviral therapy
rs8099917 T/G	T/T	Increased likelihood of spontaneous elimination of HCV regardless of treatment
	T/G	Reduced likelihood of effective therapy with interferon/ribavirin complex
	G/G	Increased risk of poor response to treatment with interferon/ribavirin complex

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