



IGF1 and IGF2 GENETIC VARIANTS

ORDERING INFORMATION

REF: GEN-047-25
Tests: 25 Reactions: 31 x 2
Manufacturer: BioMol Laboratories s.r.l.

CONTENTS OF THE KIT

The kit consists of reagents for Real-Time PCR amplification
*Reagents for the extraction of genomic DNA are not supplied in the kit

PRODUCT CHARACTERISTICS

Device belonging to the family of in vitro devices **REAL-TIME QUALITATIVE PCR-GENETIC VARIANTS- RESEARCH USE ONLY**. Detection of the C>T polymorphism of IGF-1 gene (rs35767) and G>A polymorphism of IGF-2 gene (rs680) by Real-Time PCR technique. Kit optimized for Real-time PCR instruments Biorad CFX96 Dx, Biorad Opus Dx, Agilent AriaDx, Thermofisher QuantStudio™ 5 Real-Time PCR System.

SCIENTIFIC BACKGROUND

IGF1 and IGF2 are part of the insulin-like growth factor (IGF) system which is a complex composed of two peptide hormones (IGF-1 and IGF-2), two receptors (IGF-1R and IGF-2R) and six IGF binding proteins (IGFBP1-6).

The insulin-like growth factor (IGF) signaling pathway regulates and controls cell proliferation and is essential for the growth and development of mammals. IGFs have the properties of tissue growth factors, but they also possess additional well-recognized functions similar to those of hormones that regulate growth and energy metabolism at the organism level.

IGF-1 is a potent mitogen, and through this pathway, the genes that encode such proteins may be involved in cell proliferation. Moreover Insulin-like growth factor-1 (IGF-1) acts on glucose, protein metabolism, human growth and also influences blood pressure and renal function.

Recent studies have identified IGF2's role in diabetes and fatty liver. With regard to glucose homeostasis, *IGF2BP2* is reported to be correlated with serum insulin levels and fasting blood glucose levels.

CLINICAL SIGNIFICANCE

The SNP rs35767 (previously described as -C1245T) is located in the regulatory region of the IGF1 gene. The allele C (or G, depending on the DNA strand of reference) is the more frequent variant worldwide, while the allele T (or A, depending on the DNA strand of reference) is the more frequent alternative allele. There is a growing body of evidence suggesting that the minor allele T is associated with increased circulating levels of IGF1 and with augmented muscle mass.

It has been demonstrated to increase fatty acid β oxidation during fasting, and play an important role in regulating lipid metabolism and type 2 diabetes mellitus (T2DM). The rs35767 polymorphism near IGF1 was associated with circulating IGF-1 levels, and insulin sensitivity with carriers of the GG genotype exhibiting lower IGF-1 concentrations and insulin sensitivity as compared with subjects carrying the A allele.

There was a significant association between the rs680 SNP (G>A) of the *IGF2* gene and the risk of Metabolic syndrome (MetS) in females. MetS is a disorder that encompasses a group of symptoms including central obesity, hypertension, hyperglycemia and dyslipidemia. The incidence of MetS has increased widely in recent years and always parallels the incidence of obesity and type 2 diabetes (T2DM).

§ Meta-Analysis Growth Horm IGF Res. 2024 Dec;79:101627. Association of rs35767 polymorphism in the IGF1 gene with athletic performance in power and endurance sports: A meta-analysis.

§ Front Endocrinol (Lausanne). 2021 May 20;12:654747. Association of Genetic Variants in IGF2-Related Genes With Risk of Metabolic Syndrome in the Chinese Han Population

§ Review Front Genet. 2021 Nov 22;12:774489. Association Between Insulin-like Growth Factor-1 rs35767 Polymorphism and Type 2 Diabetes Mellitus Susceptibility: A Meta-Analysis

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DESCRIPTION	LABEL	VOLUME	STORAGE
		GEN-047-25	
Mix oligonucleotides and probes	Mix IGF1 (rs35767) 10X	1 x 62 µl	-20°C
Mix oligonucleotides and probes	Mix IGF2 (rs680) 10X	1 x 62 µl	-20°C
Mix buffer and Taq polymerase	Mix Real-Time PCR 2X	1 x 620 µl	-20°C
Deionized H ₂ O	Deionized H ₂ O	1 x 1 ml	-20°C
Genomic DNA or recombinant DNA Controls IGF1 (rs35767)	Control 1	1 x 22 µl	-20°C
	Control 2	1 x 22 µl	-20°C
	Control 3	1 x 22 µl	-20°C
Genomic DNA or recombinant DNA Controls IGF2 (rs680)	Control 1	1 x 22 µl	-20°C
	Control 2	1 x 22 µl	-20°C
	Control 3	1 x 22 µl	-20°C

TECHNICAL CHARACTERISTICS

COD. GEN-047-25

STABILITY	18 months
REAGENTS STATUS	Ready to use
BIOLOGICAL MATRIX	Genomic DNA extracted from whole blood, tissues, cells
POSITIVE CONTROLS	Recombinant DNA for at least 3 analytical sessions
VALIDATED INSTRUMENTS	Biorad CFX96 Dx, Biorad Opus Dx and Agilent AriaDx, Thermofisher QuantStudio™ 5 Real-Time PCR System.
TECHNOLOGY	Real-time PCR; oligonucleotides and specific probes; 2 FAM/HEX fluorescence channels
RUNNING TIME	85 min
THERMAL CYCLING PROFILE	1 cycle at 95 °C (10 min); 45 cycles at 95 °C (15 sec) + 60 °C (60 sec)
ANALYTICAL SPECIFICITY	Absence of non-specific pairings oligonucleotides and probes; absence of cross-reactivity
LIMIT OF DETECTION (LOD)	≥ 5 ng of genomic DNA
LIMIT OF BLANK (LOB)	>40 Cq
REPRODUCIBILITY	99,9%
SPECIFICITY / SENSITIVITY	99,9%/98%