

FSHR T307A (A919G) POLYMORPHISM (FSH RECEPTOR)

ORDERING INFORMATIONS

REF: GEN-020-25
RDM Code: 1730069/R
Tests: 25 Reactions: 31
CND Code: W0106010499
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

For in vitro diagnostic use



PRODUCT CHARACTERISTICS

Device belonging to the family of in vitro medical devices **REAL-TIME QUALITATIVE PCR-GENETIC VARIANTS**. Detection of T307A (A919G) polymorphism of the FSHR gene by Real-Time PCR technique. Kit optimized for Real-Time PCR instrumentation Biorad CFX96 Dx, Biorad Opus Dx and Agilent AriaDx.

SCIENTIFIC BACKGROUND

The physiological action of the hormone FSH depends on its receptor activation (FSHR). The FSH receptor is expressed in ovarian granulosa cells and on Sertoli cells and is encoded by the FSHR gene located on chromosome 2p21-p16. Inactivating mutations of the FSHR gene have been described, but also multiple gene polymorphisms (about 900). The most common polymorphisms are rs6165 and rs6166, which correspond to FSHR substitutions Thr307Ala and Asn680Ser respectively. Both polymorphisms are present in the same exon 10 and have been found to be in «linkage disequilibrium». The two isoforms are considered variants of the FSH glycosylation/phosphorylation sites; Asn680, in fact, represents a consensus sequence for glycosylation while Thr307 represents a potential phosphorylation site. Variants of post-translational modification sites can influence the transduction of the ligand-dependent signal. In assisted reproductive technology programmes, women's ovulatory response to stimulation with exogenous follicular hormone (FSH) shows an inter-individual variability. The ovarian response to intense gonadotropin stimulation is difficult to predict, but it is known that a deficient ovarian response results in insufficient stimulation and cycle cancellation and vice versa, a hyper-response can potentially induce a serious and dangerous complication such as ovarian hyperstimulation syndrome (OHSS). The rs6165 and rs6166 polymorphisms have been extensively studied and it has been shown that the FSHR genotype related to these SNPs is predictive of ovarian responsiveness to treatment with FSH. The analysis of the FSH receptor genotype allows, therefore, to modulate individually the administration of FSH and thus increase the effectiveness and safety of the therapy. In addition, many scientific papers have recently been published on the correlation between FSH receptor polymorphisms (FSHR) and the risks of a non-physiological spermatogenesis correlated to a functional deficit in the process of spermatogenesis and therefore to a possible concause in the phenomena of oligospermia or azoospermia.

CLINICAL SIGNIFICANCE

The follicle-stimulating hormone (FSH) performs its ovarian function through important effects on granulosa cell proliferation, egg cell maturation and estrogen synthesis. Multiple studies have shown that a decrease in FSH concentration followed by a high estrogen concentration plays an important role in the selection of the dominant follicle. In humans, on the other hand, FSH is important for the regulation of metabolic functions of Sertoli cells, an essential stage for maintaining a normal spermatogenesis from a qualitative and quantitative point of view.

- § Multicenter Study *Reprod Sci.* 2024 Nov;31(11):3560-3568. The Additive Effect of Combinations of FSH Receptor Gene Variants in Ovarian Response to Stimulation
- § *J Clin Med.* 2024 Apr 13;13(8):2261. doi: 10.3390/jcm13082261. Application of Biomarkers in Obese Infertile Women: A Genetic Tool for a Personalized Treatment
- § *J Reprod Infertil.* 2023 Oct-Dec;24(4):240-247. The Effect of FSHR (G2039A) Polymorphism on Müllerian Duct Development and Hormonal Profile of Women with Primary Amenorrhea
- § *J Ovarian Res.* 2023 Sep 1;16(1):183. doi: 10.1186/s13048-023-01238-7. Polymorphisms in FSHR modulating susceptibility to polycystic ovary syndrome: an updated meta-analysis
- § Multicenter Study *Genes (Basel).* 2023 Jun 15;14(6):1269. doi: 10.3390/genes14061269. Genetic Variants of Gonadotropins and Their Receptors Could Influence Controlled Ovarian Stimulation: IVF Data from a Prospective Multicenter Study
- § *Int J Mol Sci.* 2023 Jan 5;24(2):1080. doi: 10.3390/ijms24021080. The Polymorphism Asn680Ser on the FSH Receptor and Abnormal Ovarian Response in Patients with Normal Values of AMH and AFC
- § *Front Endocrinol (Lausanne).* 2022 Feb 11;2:797365. doi: 10.3389/fendo.2021.797365. eCollection 2021. Effect of Genetic Variants of Gonadotropins and Their Receptors on Ovarian Stimulation Outcomes: A Delphi Consensus
- § The susceptibility of FSHB -211G > T and FSHR G-29A, 919A > G, 2039A > G polymorphisms to men infertility: an association study and meta-analysis. *BMC Med Genet.* 2017 Aug 1; 18(1):81.
- § FSH receptor gene p. Thr307Ala and p. Asn680Ser polymorphisms are associated with the risk of polycystic ovary syndrome. *J Assist Reprod Genet.* 2017 Aug; 34(8):1087-1093. Epub 2017 May 25.
- § Follicle-Stimulating Hormone Receptor (FSHR): A Promising Tool in Oncology? *Mol Diagn Ther.* 2016 Dec; 20(6):523-530. Review.

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DESCRIPTION	LABEL	VOLUME	STORAGE
		GEN-020-25	
Mix oligonucleotides and probes	Mix T307A FSHR 10X	1 x 77,5 µl	-20°C
Mix buffer and Taq polymerase enzyme	Mix Real-Time PCR 2X	1 x 387,5 µl	-20°C
Deionized H ₂ O	Deionized H ₂ O	1 x 1 ml	-20°C
Genomic DNA or recombinant DNA	Control 1	1 x 22µl	-20°C
Genomic DNA or recombinant DNA	Control 2	1 x 22µl	-20°C
Genomic DNA or recombinant DNA	Control 3	1 x 22µl	-20°C

TECHNICAL CHARACTERISTICS

COD. GEN-020-25

STABILITY	18 months
REAGENTS STATUS	Ready to use
BIOLOGICAL MATRIX	Genomic DNA extracted from whole blood, tissue, cells
CONTROLS	Recombinant DNA for at least 3 analytical sessions
VALIDATED INSTRUMENTS	Biorad CFX96 Dx, Biorad Opus Dx and Agilent AriaDx
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 of oligonucleotides and probes; absence of cross-reactivity
LIMIT OF DETECTION (LOD)	≥ 0,016 ng of genomic DNA
LIMIT OF BLANK (LOB)	0% NCN
REPRODUCIBILITY	99,9%
DIAGNOSTIC SPECIFICITY / DIAGNOSTIC SENSITIVITY	100%/98%