

AGTR1 A1166C POLYMORPHISM

ORDERING INFORMATION

REF: GEN-011-25 RDM Code: 1737734/R
Tests: 25 Reactions: 31
REF: GEN-011-50 RDM Code: 2256357/R
Tests: 50 Reactions: 62
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 A1166C polymorphism of the gene coding for the type I angiotensin 2 receptor, AGTR1, by Real-Time PCR technique. Optimized kit for Real-Time PCR instrumentation Biorad CFX96, Biorad Opus Dx and Agilent AriaDx.

SCIENTIFIC BACKGROUND

There are numerous components of this system: renin, prorenin, angiotensin converting enzyme (ACE), angiotensinogen (AGT), angiotensin I and angiotensin II; the latter represents the final effector of the renin-angiotensin system and exerts its effects on the cardiovascular system through binding with specific receptors. The first step in the enzymatic cascade leading to the production of angiotensin II is the conversion of angiotensinogen to angiotensin I by the proteolytic enzyme renin. The second step in the process involves the conversion of angiotensin I to angiotensin II, via a reaction catalysed by ACE. Angiotensin II is the main active peptide of the RAAS which functions through at least four types of receptors. The AGTR1 receptor mediates cardiovascular effects, including vasoconstriction, aldosterone synthesis, vasopressin secretion, vascular smooth muscle cell proliferation, renal blood flow, regulation of renin activity, renal sodium absorption, modulation of sympathetic nervous system activity, and cardiac function.

There are genetic polymorphisms in the various components of the RAS that may have clinical relevance. A single nucleotide polymorphism has been described for the AGTR1 gene, causing the A1166C substitution in the 3'-untranscribed region.

The presence of the C allele correlates with a greater risk of developing arterial hypertension, being subject to cerebral stroke especially in smokers and a greater risk of recurrence of acute myocardial infarction.

CLINICAL SIGNIFICANCE

The renin-angiotensin-aldosterone system (SRAA) is a hormonal mechanism that regulates blood pressure, circulating plasma volume, arterial muscle tone through various mechanisms and aldosterone secretion; it also plays an important role in the etiology of hypertension.

The renin-angiotensin system (SRAA) also exerts local effects on cell proliferation, apoptosis, inflammation and angiogenesis in various tissues. Furthermore, there are data in the literature correlating SRAA with tumor tumorigenesis and angiogenesis.

Each of the SRAA-related polymorphisms, alone or in combination, may be related to increased or decreased activity of the SRAA system and thus to the physiological processes controlled by that system.

- 5 Meta-Analysis PLoS One. 2024 Jan 2;19(1):e0295626. doi: 10.1371/journal.pone.0295626. eCollection 2024. Impact of the gene polymorphisms in the renin-angiotensin system on cardiomyopathy risk: A meta-analysis
- 5 PLoS One. 2024 Apr 18;19(4):e0300273. doi: 10.1371/journal.pone.0300273. eCollection 2024. Effect of AGTR1 A1166C genetic polymorphism on coronary artery lesions and mortality in patients with acute myocardial infarction
- 5 J Renin Angiotensin Aldosterone Syst. 2023 Nov 16;2023:9002021. doi: 10.1155/2023/9002021. eCollection 2023. Genetic Variants Associated with High Susceptibility of Premature Ischemic Stroke
- 5 Front Biosci (Landmark Ed). 2023 Jul 24;28(7):146. doi: 10.31083/j.fbl2807146. Association between AGTR1 (c.1166 A>C) Polymorphisms and Kidney Injury in Hypertension
- 5 Association of AGTR1 A1166C and CYP2C9*3 Gene Polymorphisms with the Antihypertensive Effect of Valsartan. Int J Hypertens. 2022 Mar 19;2022:7677252. doi: 10.1155/2022/7677252
- 5 Medicine (Baltimore). 2018 Oct;97(41):e07689. doi: 10.1097/MD.00000000000007689. Association between AGTR1 A1166C polymorphism and the susceptibility to diabetic nephropathy: Evidence from a meta-analysis
- 5 AGT M235T polymorphism and heart failure in a cohort of Tunisian population: diagnostic and prognostic value. Int J Clin Exp Med. 2015 Sep 15;8(9):16346-51.
- 5 Renin-angiotensin-aldosterone system gene polymorphisms and coronary artery disease: detection of gene-gene and gene-environment interactions. Cell Physiol Biochem. 2012;29(3-4):443-52.
- 5 Genetic variation in renin predicts the effects of thiazide diuretics. Eur J Clin Invest. 2011 Aug;41(8):828-35.

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DESCRIPTION	LABEL	VOLUME		STORAGE
		GEN-011-25	GEN-011-50	
Mix oligonucleotides and probes	Mix A1166C AGTR1 10X	1 x 77,5 µl	2 x 77,5 µl	-20°C
Mix buffer and Taq polymerase	Mix Real-Time PCR 5X	1 x 155 µl	2 x 155 µl	-20°C
Deionized H ₂ O	Deionized H ₂ O	1 x 1 ml	1 x 1 ml	-20°C
Genomic DNA or recombinant DNA	Control 1	1 x 22 µl	2 x 22 µl	-20°C
Genomic DNA or recombinant DNA	Control 2	1 x 22 µl	2 x 22 µl	-20°C
Genomic DNA or recombinant DNA	Control 3	1 x 22 µl	2 x 22 µl	-20°C

TECHNICAL CHARACTERISTICS

COD. GEN-011-25 / COD. GEN-011-50

STABILITY	18 months
REAGENTS STATUS	Ready to use
BIOLOGICAL MATRIX	Genomic DNA extracted from whole blood, tissue, cells
POSITIVE CONTROLS	Recombinant DNA for at least 3 analytical sessions (GEN-011-25) Recombinant DNA for at least 6 analytical sessions (GEN-011-50)
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%