

AGT (M235T) T9543C POLYMORPHISM (ANGIOTENSINOGEN)

ORDERING INFORMATION

REF: GEN-010-25 RDM Code: 1737722/R
Tests: 25 Reactions: 31
REF: GEN-010-50 RDM Code: 2255499/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 the T9543C polymorphism of the angiotensinogen gene, AGT, by Real-Time PCR technique. Kit optimized for Real-Time PCR instrumentation Biorad CFX96 Dx, Biorad Opus Dx and Agilent AriaDx.

SCIENTIFIC BACKGROUND

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.

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.

CLINICAL SIGNIFICANCE

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. There are genetic polymorphisms in the various components of the RAS that may have clinical relevance. For the AGT gene, located on the chromosome and encoding the angiotensinogen protein, a single nucleotide polymorphism has been described, causing the substitution of methionine to threonine at amino acid residue 235 (M235T). This polymorphism (AGT T9543C) has been associated with hypertension in Caucasian populations and several studies have linked the 235TT genotype with a higher risk of breast cancer. 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. Out come after traumatic brain injury, cerebrovascular disease ischemia, sleep apnea, telomere shortening, and impaired neurite outgrowth.

§ J Renin Angiotensin Aldosterone Syst. 2023 Feb 17;2023:4944239. Polymorphisms in the Renin-Angiotensin System and eNOS Glu298Asp Genes Are Associated with Increased Risk for Essential Hypertension in a Mexican Population

§ Associations between AGT M235T Polymorphism and Cancer: An Updated Meta-Analysis. J Renin Angiotensin Aldosterone Syst. 2022 Mar 4;2022:7862709 doi: 10.1155/2022/7862709

§ J Asthma Allergy. 2019 Oct 8;12:343-361. IgE-Mediated Systemic Anaphylaxis And Its Association With Gene Polymorphisms Of ACE, Angiotensinogen And Chymase

§ Associations between angiotensinogen M235T polymorphisms and the risk of diabetic nephropathy: A meta-analysis. Diabetes Res Clin Pract. 2018 Aug;142:26-36.

§ Angiotensin II receptor type 1 A1166C modifies the association between angiotensinogen M235T and chronic kidney disease. Oncotarget. 2017 Oct 26;8(64):107833-107843.

§ 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.

§ 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.

§ 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-010-25	GEN-010-50	
Mix oligonucleotides and probes	Mix T9543C AGT 10X	1 x 77,5 µl	2 x 77,5 µl	-20°C
Mix buffer and Taq polymerase	Mix Real-Time PCR 2X	1 x 387,5 µl	2 x 387,5 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-010-25 / COD. GEN-010-50

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 (GEN-010-25) Recombinant DNA for at least 6 analytical sessions (GEN-010-50)
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%