ARG43262
anti-CLOCK / KAT13D antibody

Package: 100 µl
Store at: -20°C

Summary

Product Description	Rabbit Polyclonal antibody recognizes CLOCK / KAT13D
Tested Reactivity	Hu, Ms, Rat
Tested Application	FACS, ICC/IF, WB
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Target Name	CLOCK / KAT13D
Species	Human
Immunogen	Synthetic peptide derived from Human CLOCK / KAT13D.
Conjugation	Un-conjugated
Alternate Names	EC 2.3.1.48; hCLOCK; Class E basic helix-loop-helix protein 8; Circadian locomoter output cycles protein kaput; KAT13D; bHLHe8

Application Instructions

Application table

Application	Dilution
FACS	1:50
ICC/IF	1:50 - 1:200
WB	1:1000 - 1:5000

Application Note	* The dilutions indicate recommended starting dilutions and the optimal dilutions or concentrations should be determined by the scientist.
Positive Control	293T
Observed Size	~ 95 kDa

Properties

Form	Liquid
Purification	Affinity purified.
Buffer	PBS (pH 7.4), 150 mM NaCl, 0.02% Sodium azide and 50% Glycerol.
Preservative	0.02% Sodium azide
Stabilizer	50% Glycerol
Storage instruction	For continuous use, store undiluted antibody at 2-8°C for up to a week. For long-term storage, aliquot and store at -20°C. Storage in frost free freezers is not recommended. Avoid repeated freeze/thaw cycles. Suggest spin the vial prior to opening. The antibody solution should be gently mixed before use.

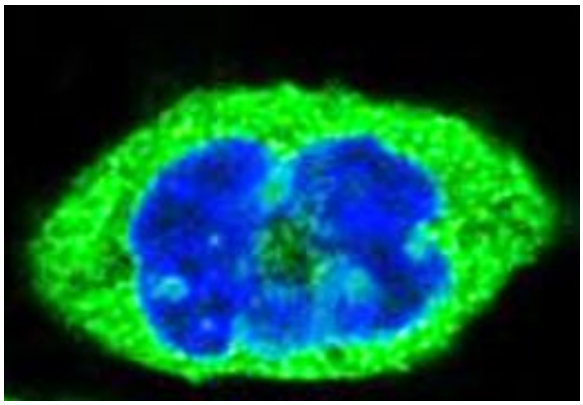
Note	For laboratory research only, not for drug, diagnostic or other use.

Bioinformation

Gene Symbol	CLOCK
Gene Full Name	clock circadian regulator
Background	The protein encoded by this gene plays a central role in the regulation of circadian rhythms. The protein encodes a transcription factor of the basic helix-loop-helix (bHLH) family and contains DNA binding histone acetyltransferase activity. The encoded protein forms a heterodimer with ARNTL (BMAL1) that binds E-box enhancer elements upstream of Period (PER1, PER2, PER3) and Cryptochrome (CRY1, CRY2) genes and activates transcription of these genes. PER and CRY proteins heterodimerize and repress their own transcription by interacting in a feedback loop with CLOCK/ARNTL complexes. Polymorphisms in this gene may be associated with behavioral changes in certain populations and with obesity and metabolic syndrome. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Jan 2014]
Function	Transcriptional activator which forms a core component of the circadian clock. The circadian clock, an internal time-keeping system, regulates various physiological processes through the generation of approximately 24 hour circadian rhythms in gene expression, which are translated into rhythms in metabolism and behavior. It is derived from the Latin roots 'circa' (about) and 'diem' (day) and acts as an important regulator of a wide array of physiological functions including metabolism, sleep, body temperature, blood pressure, endocrine, immune, cardiovascular, and renal function. Consists of two major components: the central clock, residing in the suprachiasmatic nucleus (SCN) of the brain, and the peripheral clocks that are present in nearly every tissue and organ system. Both the central and peripheral clocks can be reset by environmental cues, also known as Zeitgebers (German for 'timegivers'). The predominant Zeitgeber for the central clock is light, which is sensed by retina and signals directly to the SCN. The central clock entrains the peripheral clocks through neuronal and hormonal signals, body temperature and feeding-related cues, aligning all clocks with the external light/dark cycle. Circadian rhythms allow an organism to achieve temporal homeostasis with its environment at the molecular level by regulating gene expression to create a peak of protein expression once every 24 hours to control when a particular physiological process is most active with respect to the solar day. Transcription and translation of core clock components (CLOCK, NPAS2, ARNTL/BMAL1, ARNTL2/BMAL2, PER1, PER2, PER3, CRY1 and CRY2) plays a critical role in rhythm generation, whereas delays imposed by post-translational modifications (PTMs) are important for determining the period (tau) of the rhythms (tau refers to the period of a rhythm and is the length, in time, of one complete cycle). A diurnal rhythm is synchronized with the day/night cycle, while the ultradian and infradian rhythms have a period shorter and longer than 24 hours, respectively. Disruptions in the circadian rhythms contribute to the pathology of cardiovascular diseases, cancer, metabolic syndromes and aging. A transcription/translation feedback loop (TTFL) forms the core of the molecular circadian clock mechanism. Transcription factors, CLOCK or NPAS2 and ARNTL/BMAL1 or ARNTL2/BMAL2, form the positive limb of the feedback loop, act in the form of a heterodimer and activate the transcription of core clock genes and clock-controlled genes (involved in key metabolic processes), harboring E-box elements (5'-CACGTG-3') within their promoters. The core clock genes: PER1/2/3 and CRY1/2 which are transcriptional repressors form the negative limb of the feedback loop and interact with the CLOCK|NPAS2-ARNTL/BMAL1|ARNTL2/BMAL2 heterodimer inhibiting its activity and thereby negatively regulating their own expression. This heterodimer also activates nuclear receptors NR1D1/2 and RORA/B/G, which form a second feedback loop and which activate and repress ARNTL/BMAL1 transcription, respectively. Regulates the circadian expression of ICAM1, VCAM1, CCL2, THPO and MPL and also acts as an enhancer of the transactivation potential of NF-kappaB. Plays an important role in the homeostatic regulation of sleep. The CLOCK-ARNTL/BMAL1 heterodimer regulates the circadian expression of SERPINE1/PAI1, VWF, B3, CCRN4L/NOC, NAMPT, DBP, MYOD1, PPARGC1A, PPARGC1B, SIRT1, GYS2, F7, NGFR, GNRHR, BHLHE40/DEC1, ATF4, MTA1, KLF10 and also genes implicated in glucose and lipid metabolism. Promotes rhythmic chromatin opening, regulating the DNA accessibility of other transcription factors. The CLOCK-ARNTL2/BMAL2 heterodimer activates the transcription of SERPINE1/PAI1 and BHLHE40/DEC1. The preferred binding motif for the CLOCK-ARNTL/BMAL1 heterodimer is 5'-CACGTGA-3', which contains a flanking Ala residue in addition to the canonical 6-nucleotide E-box sequence (PubMed:23229515). CLOCK specifically binds to the half-site 5'-CAC-3', while ARNTL binds to the half-site 5'-GTGA-3' (PubMed:23229515). The CLOCK-ARNTL/BMAL1 heterodimer also recognizes the non-canonical E-box motifs 5'-AACGTGA-3' and 5'-CATGTGA-3' (PubMed:23229515). CLOCK has an intrinsic acetyltransferase activity, which enables circadian chromatin remodeling by acetylating histones and nonhistone proteins, including its own partner ARNTL/BMAL1. Represses glucocorticoid receptor NR3C1/GR-induced transcriptional activity by reducing the association of NR3C1/GR to glucocorticoid response elements (GREs) via the acetylation of multiple lysine residues located in its hinge region (PubMed:21980503). The acetyltransferase activity

	of CLOCK is as important as its transcription activity in circadian control. Acetylates metabolic enzymes IMPDH2 and NDUFA9 in a circadian manner. Facilitated by BMAL1, rhythmically interacts and acetylates argininosuccinate synthase 1 (ASS1) leading to enzymatic inhibition of ASS1 as well as the circadian oscillation of arginine biosynthesis and subsequent ureagenesis (PubMed:28985504). Drives the circadian rhythm of blood pressure through transcriptional activation of ATP1B1 (By similarity). [UniProt]
Calculated Mw	95 kDa
PTM	Ubiquitinated, leading to its proteasomal degradation. O-glycosylated; contains O-GlcNAc. O-glycosylation by OGT prevents protein degradation by inhibiting ubiquitination. It also stabilizes the CLOCK-ARNTL/BMAL1 heterodimer thereby increasing CLOCK-ARNTL/BMAL1-mediated transcriptional activation of PER1/2/3 and CRY1/2. Phosphorylation is dependent on the CLOCK-ARNTL/BMAL1 heterodimer formation. Phosphorylation enhances the transcriptional activity, alters the subcellular localization and decreases the stability of the heterodimer by promoting its degradation. Phosphorylation shows circadian variations in the liver. May be phosphorylated by CSNK1D and CKSN1E. Sumoylation enhances its transcriptional activity and interaction with ESR1, resulting in up-regulation of ESR1 activity. Estrogen stimulates sumoylation. Desumoylation by SENP1 negatively regulates its transcriptional activity. Sumoylation stimulates cell proliferation and increases the proportion of S phase cells in breast cancer cell lines. [UniProt]
Cellular Localization	Nucleus. Cytoplasm. Cytoplasm, cytosol. Note=Shuffling between the cytoplasm and the nucleus is under circadian regulation and is ARNTL/BMAL1-dependent. Phosphorylated form located in the nucleus while the nonphosphorylated form found only in the cytoplasm. Sequestered to the cytoplasm in the presence of ID2 (By similarity). Localizes to sites of DNA damage in a H2AX-independent manner. [UniProt]

Images



ARG43262 anti-CLOCK / KAT13D antibody ICC/IF image

Immunofluorescence: HeLa cells stained with ARG43262 anti-CLOCK / KAT13D antibody.

ARG43262 anti-CLOCK / KAT13D antibody WB image

Western blot: 293T cell lysate stained with ARG43262 anti-CLOCK / KAT13D antibody.