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Mouse Monoclonal Antibody to ATF4

Purified Mouse Monoclonal Antibody
Catalog # AO2491a

Product Information

Application	WB, IHC, E
Primary Accession	P18848
Reactivity	Human
Host	Mouse
Clonality	Monoclonal
Clone Names	2A6F12
Isotype	Mouse IgG1
Calculated MW	38590
Description	This gene encodes a transcription factor that was originally identified as a widely expressed mammalian DNA binding protein that could bind a tax-responsive enhancer element in the LTR of HTLV-1. The encoded protein was also isolated and characterized as the cAMP-response element binding protein 2 (CREB-2). The protein encoded by this gene belongs to a family of DNA-binding proteins that includes the AP-1 family of transcription factors, cAMP-response element binding proteins (CREBs) and CREB-like proteins. These transcription factors share a leucine zipper region that is involved in protein-protein interactions, located C-terminal to a stretch of basic amino acids that functions as a DNA binding domain. Two alternative transcripts encoding the same protein have been described. Two pseudogenes are located on the X chromosome at q28 in a region containing a large inverted duplication. ;
Immunogen	Purified recombinant fragment of human ATF4 (AA: 212-351) expressed in E. Coli.
Formulation	Purified antibody in PBS with 0.05% sodium azide
Application Note	ELISA: 1/10000; WB: 1/500 - 1/2000; IHC: 1/200 - 1/1000;

Additional Information

Gene ID	468
Other Names	CREB2; TXREB; CREB-2; TAXREB67
Dilution	WB~~1:1000 IHC~~1:100~500 E~~N/A
Storage	Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	Mouse Monoclonal Antibody to ATF4 is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name

ATF4 {ECO:0000303|PubMed:2516827, ECO:0000312|HGNC:HGNC:786}

Function

Transcription factor that binds the cAMP response element (CRE) (consensus: 5'-GTGACGT[AC][AG]-3') and displays two biological functions, as regulator of metabolic and redox processes under normal cellular conditions, and as master transcription factor during integrated stress response (ISR) (PubMed:16682973, PubMed:17684156, PubMed:31023583, PubMed:31444471, PubMed:32132707). Binds to asymmetric CRE's as a heterodimer and to palindromic CRE's as a homodimer (By similarity). Core effector of the ISR, which is required for adaptation to various stress such as endoplasmic reticulum (ER) stress, amino acid starvation, mitochondrial stress or oxidative stress (PubMed:31023583, PubMed:32132707). During ISR, ATF4 translation is induced via an alternative ribosome translation re-initiation mechanism in response to EIF2S1/eIF-2-alpha phosphorylation, and stress-induced ATF4 acts as a master transcription factor of stress-responsive genes in order to promote cell recovery (PubMed:31023583, PubMed:32132706, PubMed:32132707). Promotes the transcription of genes linked to amino acid sufficiency and resistance to oxidative stress to protect cells against metabolic consequences of ER oxidation (By similarity). Activates the transcription of NLRP1, possibly in concert with other factors in response to ER stress (PubMed:26086088). Activates the transcription of asparagine synthetase (ASNS) in response to amino acid deprivation or ER stress (PubMed:11960987). However, when associated with DDIT3/CHOP, the transcriptional activation of the ASNS gene is inhibited in response to amino acid deprivation (PubMed:18940792). Together with DDIT3/CHOP, mediates programmed cell death by promoting the expression of genes involved in cellular amino acid metabolic processes, mRNA translation and the terminal unfolded protein response (terminal UPR), a cellular response that elicits programmed cell death when ER stress is prolonged and unresolved (By similarity). Activates the expression of COX7A2L/SCAF1 downstream of the EIF2AK3/PERK-mediated unfolded protein response, thereby promoting formation of respiratory chain supercomplexes and increasing mitochondrial oxidative phosphorylation (PubMed:31023583). Together with DDIT3/CHOP, activates the transcription of the IRS-regulator TRIB3 and promotes ER stress-induced neuronal cell death by regulating the expression of BBC3/PUMA in response to ER stress (PubMed:15775988). May cooperate with the UPR transcriptional regulator QRICH1 to regulate ER protein homeostasis which is critical for cell viability in response to ER stress (PubMed:33384352). In the absence of stress, ATF4 translation is at low levels and it is required for normal metabolic processes such as embryonic lens formation, fetal liver hematopoiesis, bone development and synaptic plasticity (By similarity). Acts as a regulator of osteoblast differentiation in response to phosphorylation by RPS6KA3/RSK2: phosphorylation in osteoblasts enhances transactivation activity and promotes expression of osteoblast-specific genes and post-transcriptionally regulates the synthesis of Type I collagen, the main constituent of the bone matrix (PubMed:15109498). Cooperates with FOXO1 in osteoblasts to regulate glucose homeostasis through suppression of beta-cell production and decrease in insulin production (By similarity). Activates transcription of SIRT4 (By similarity). Regulates the circadian expression of the core clock component PER2 and the serotonin transporter SLC6A4 (By similarity). Binds in a circadian time-dependent manner to the cAMP response elements (CRE) in the SLC6A4 and PER2 promoters and periodically activates the transcription of these genes (By similarity). Mainly acts as a transcriptional activator in cellular stress adaptation, but it can also act as a transcriptional repressor: acts as a regulator of synaptic plasticity by repressing transcription, thereby inhibiting induction and maintenance of

long- term memory (By similarity). Regulates synaptic functions via interaction with DISC1 in neurons, which inhibits ATF4 transcription factor activity by disrupting ATF4 dimerization and DNA-binding (PubMed:31444471).

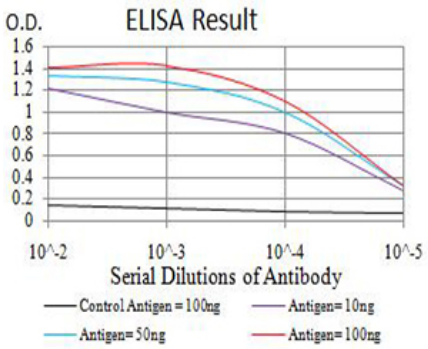
Cellular Location

Nucleus. Nucleus speckle. Cytoplasm {ECO:0000250|UniProtKB:Q9ES19}. Cell membrane {ECO:0000250|UniProtKB:Q9ES19}. Cytoplasm, cytoskeleton, microtubule organizing center, centrosome Note=Colocalizes with GABBR1 in hippocampal neuron dendritic membranes (By similarity). Colocalizes with NEK6 at the centrosome (PubMed:20873783). Recruited to nuclear speckles following interaction with EP300/p300 (PubMed:16219772). {ECO:0000250|UniProtKB:Q9ES19, ECO:0000269|PubMed:16219772, ECO:0000269|PubMed:20873783}

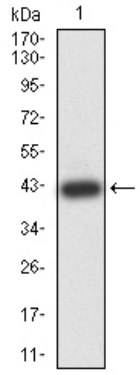
References

1.Cell. 2014 Aug 28;158(5):1159-72. ; 2.Tumour Biol. 2014 Jan;35(1):765-71.;

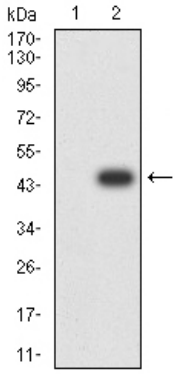
Images



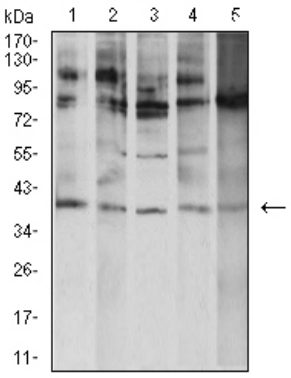
Black line: Control Antigen (100 ng);Purple line: Antigen (10ng); Blue line: Antigen (50 ng); Red line:Antigen (100 ng)



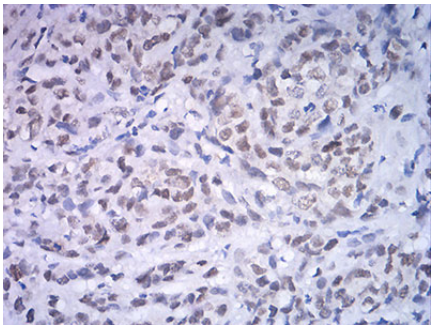
Western blot analysis using ATF4 mAb against human ATF4 (AA: 212-351) recombinant protein. (Expected MW is 41.5 kDa)



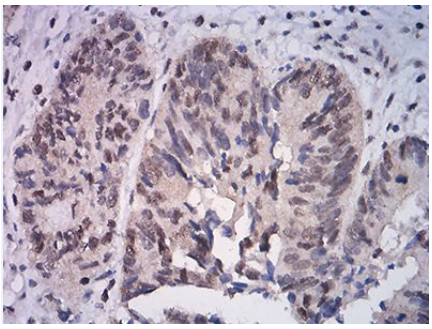
Western blot analysis using ATF4 mAb against HEK293 (1) and ATF4 (AA: 212-351)-hIgGFc transfected HEK293 (2) cell lysate.



Western blot analysis using ATF4 mouse mAb against K562 (1), A431 (2), Hela (3), HEK293 (4), and Ramos (5) cell lysate.



Immunohistochemical analysis of paraffin-embedded breast cancer tissues using ATF4 mouse mAb with DAB staining.



Immunohistochemical analysis of paraffin-embedded rectum cancer tissues using ATF4 mouse mAb with DAB staining.

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.