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Anti-ATF4 Antibody

Catalog # AP51001

Product Information

Application	WB, IHC, IF/IC
Primary Accession	P18848
Reactivity	Human, Mouse, Rat
Host	Rabbit
Clonality	Polyclonal
Calculated MW	38590

Additional Information

Gene ID	468
Other Names	CREB2; TXREB; Cyclic AMP-dependent transcription factor ATF-4; cAMP-dependent transcription factor ATF-4; Activating transcription factor 4; Cyclic AMP-responsive element-binding protein 2; CREB-2; cAMP-responsive element-binding protein 2; DNA-binding protein TAXREB67; Tax-responsive enhancer element-binding protein 67; TaxREB67
Target/Specificity	KLH-conjugated synthetic peptide encompassing a sequence within the center region of human ATF4. The exact sequence is proprietary.
Dilution	WB~~WB (1/500 - 1/1000) IHC~~1:100~500 IF/IC~~N/A
Format	Liquid in 0.42% Potassium phosphate, 0.87% Sodium chloride, pH 7.3, 30% glycerol, and 0.01% sodium azide.
Storage	Store at -20 °C.Stable for 12 months from date of receipt

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

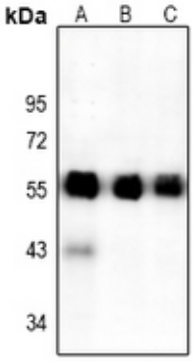
Nucleus. Nucleus speckle. Cytoplasm {ECO:0000250|UniProtKB:Q9ES19}. Cell membrane {ECO:0000250|UniProtKB:Q9ES19}. Cytoplasm, cytoskeleton, microtubule organizing center, centrosome Note=Colocalizes with GABBR1 in hippocampal neuron dendritic membranes (By similarity). Colocalizes with NEK6 at the centrosome (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

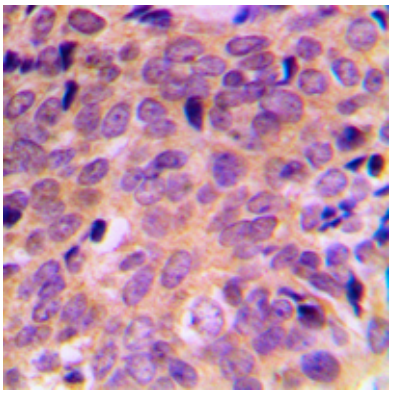
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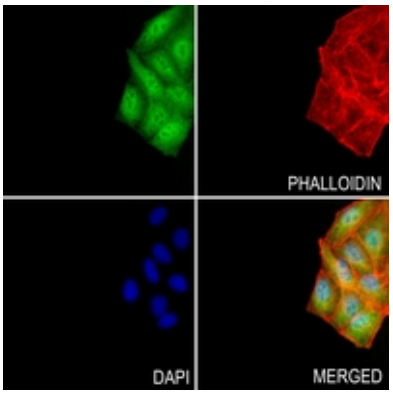
Images



Western blot analysis of ATF4 expression in SGC7901 (A), C6 (B), EC7901 (C) whole cell lysates. (Predicted band size: 38 kD; Observed band size: 55 kD)



Immunohistochemical analysis of ATF4 staining in human breast cancer formalin fixed paraffin embedded tissue section. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH 6.0). The section was then incubated with the antibody at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX.



Immunofluorescent analysis of ATF4 staining in H460 cells. Formalin-fixed cells were permeabilized with 0.1% Triton X-100 in TBS for 5-10 minutes and blocked with 3% BSA-PBS for 30 minutes at room temperature. Cells were probed with the primary antibody in 3% BSA-PBS and incubated overnight at 4 °C in a hidified chamber. Cells were washed with PBST and incubated with a AF488-conjugated secondary antibody (green) in PBS at room temperature in the dark. Phalloidin - AF594 was used to stain Actin filaments (red). DAPI was used to stain the cell nuclei (blue).

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