



## Rabbit Anti-FOXO1 + FOXO3 + FOXO4 antibody

SL7068R

<b>Product Name:</b>	FOXO1 + FOXO3 + FOXO4
<b>Chinese Name:</b>	叉头蛋白O1/O3/O4抗体
<b>Alias:</b>	AFX1; FOXO1+FOXO3+FOXO4; FKH1; FKHRL1; FKHRL1P2; Forkhead box O1; Forkhead box O3; Forkhead box O4; FOXO1; FOXO2; FOXO3; FOXO4; MLLT7; FOXO1_HUMAN; FOXO3_HUMAN; FOXO4_HUMAN.
<b>Organism Species:</b>	Rabbit
<b>Clonality:</b>	Polyclonal
<b>React Species:</b>	Human,Mouse,Rat,Chicken,Dog,Pig,Horse,Sheep,
<b>Applications:</b>	WB=1:500-2000ELISA=1:500-1000IHC-P=1:400-800IHC-F=1:400-800IF=1:100-500 (Paraffin sections need antigen repair) not yet tested in other applications. optimal dilutions/concentrations should be determined by the end user.
<b>Molecular weight:</b>	70kDa
<b>Cellular localization:</b>	The nucleuscytoplasmic
<b>Form:</b>	Lyophilized or Liquid
<b>Concentration:</b>	1mg/ml
<b>immunogen:</b>	KLH conjugated synthetic peptide derived from human FOXO1/FOXO3/FOXO4:201-300/655
<b>Lsotype:</b>	IgG
<b>Purification:</b>	affinity purified by Protein A
<b>Storage Buffer:</b>	0.01M TBS(pH7.4) with 1% BSA, 0.03% Proclin300 and 50% Glycerol.
<b>Storage:</b>	Store at -20 °C for one year. Avoid repeated freeze/thaw cycles. The lyophilized antibody is stable at room temperature for at least one month and for greater than a year when kept at -20°C. When reconstituted in sterile pH 7.4 0.01M PBS or diluent of antibody the antibody is stable for at least two weeks at 2-4 °C.
<b>PubMed:</b>	<a href="#">PubMed</a>
<b>Product Detail:</b>	FOXO1 + FOX3 + FOX4 belong to the forkhead family of transcription factors. FOXO1 (FKHR or ForkHead in Rhabdomyosarcoma) is a 70 kDa protein. Recent studies have shown that this protein can act as either a coactivator or a corepressor of nuclear receptor activity. This action is mediated through the LXXLL motif found in the C terminus of

the FOXO1A protein. The specific function of the gene has not yet been determined. FOX3 probably functions as a trigger for apoptosis through expression of genes necessary for cell death. Translocation of the FOXO3 gene with the MLL gene is associated with secondary acute leukemia. FOX4 is a forkhead transcription factor involved in the regulation of the insulin signaling pathway. It binds to insulin-response elements (IREs) and can activate transcription of IGFBP1. FOXO4 down-regulates expression of HIF1A and suppresses hypoxia-induced transcriptional activation of HIF1A-modulated genes. It is also involved in negative regulation of the cell cycle.

**Function:**

Transcription factor that is the main target of insulin signaling and regulates metabolic homeostasis in response to oxidative stress. Binds to the insulin response element (IRE) with consensus sequence 5'-TT[G/A]TTTTG-3' and the related Daf-16 family binding element (DBE) with consensus sequence 5'-TT[G/A]TTTAC-3'. Activity suppressed by insulin. Main regulator of redox balance and osteoblast numbers and controls bone mass. Orchestrates the endocrine function of the skeleton in regulating glucose metabolism. Acts synergistically with ATF4 to suppress osteocalcin/BGLAP activity, increasing glucose levels and triggering glucose intolerance and insulin insensitivity. Also suppresses the transcriptional activity of RUNX2, an upstream activator of osteocalcin/BGLAP. In hepatocytes, promotes gluconeogenesis by acting together with PPARGC1A to activate the expression of genes such as IGFBP1, G6PC and PPCK1. Important regulator of cell death acting downstream of CDK1, PKB/AKT1 and SKT4/MST1. Promotes neural cell death. Mediates insulin action on adipose. Regulates the expression of adipogenic genes such as PPARG during preadipocyte differentiation and, adipocyte size and adipose tissue-specific gene expression in response to excessive calorie intake. Regulates the transcriptional activity of GADD45A and repair of nitric oxide-damaged DNA in beta-cells.

**Subunit:**

Interacts with LRPPRC. Interacts with RUNX2; the interaction inhibits RUNX2 transcriptional activity and mediates the IGF1/insulin-dependent BGLAP expression in osteoblasts. Interacts with PPP2R1A; the interaction regulates the dephosphorylation of FOXO1 at Thr-24 and Ser-256 leading to its nuclear import (By similarity). Interacts with NLK. Interacts with SIRT1; the interaction results in the deacetylation of FOXO1 leading to activation of FOXO1-mediated transcription of genes involved in DNA repair and stress resistance. Binds to CDK1. Interacts with the 14-3-3 proteins, YWHAG and YWHAZ; the interactions require insulin-stimulated phosphorylation on Thr-24, promote nuclear exit and loss of transcriptional activity. Interacts with SKP2; the interaction ubiquitinates FOXO1 leading to its proteosomal degradation. The interaction requires the presence of KRIT1. Interacts (via the C-terminal half) with ATF4 (via its DNA-binding domain); the interaction occurs in osteoblasts, regulates glucose homeostasis via suppression of beta-cell proliferation and subsequent decrease in insulin production. Interacts with PRMT1; the interaction methylates FOXO1, prevents PKB/AKT1 phosphorylation and retains FOXO1 in the nucleus. Interacts with EP300 and CREBBP; the interactions acetylate FOXO1.

**Subcellular Location:**

Cytoplasm. Nucleus. Note=Shuttles between the cytoplasm and nucleus. Largely nuclear in unstimulated cells. In osteoblasts, colocalizes with ATF4 and RUNX2 in the nucleus. Insulin-induced phosphorylation at Ser-256 by PKB/AKT1 leads, via stimulation of Thr-24 phosphorylation, to binding of 14-3-3 proteins and nuclear export to the cytoplasm where it is degraded by the ubiquitin-proteosomal pathway. Phosphorylation at Ser-249 by CDK1 disrupts binding of 14-3-3 proteins and promotes nuclear accumulation. Phosphorylation by NLK results in nuclear export. Translocates to the nucleus upon oxidative stress-induced phosphorylation at Ser-212 by STK4/MST1. SGK1-mediated phosphorylation also results in nuclear translocation. Retained in the nucleus under stress stimuli including oxidative stress, nutrient deprivation or nitric oxide. Retained in the nucleus on methylation.

**Tissue Specificity:**

Ubiquitous.

**Post-translational modifications:**

Phosphorylation by NLK promotes nuclear export and inhibits the transcriptional activity. In response to growth factors, phosphorylation on Thr-24, Ser-256 and Ser-322 by PKB/AKT1 promotes nuclear export and inactivation of transactivational activity. Phosphorylation on Thr-24 is required for binding 14-3-3 proteins. Phosphorylation of Ser-256 decreases DNA-binding activity and promotes the phosphorylation of Thr-24 and Ser-319, permitting phosphorylation of Ser-322 and Ser-325, probably by CDK1, leading to nuclear exclusion and loss of function. Stress signals, such as response to oxygen or nitric oxide, attenuate the PKB/AKT1-mediated phosphorylation leading to nuclear retention. Phosphorylation of Ser-329 is independent of IGF1 and leads to reduced function. Dephosphorylated on Thr-24 and Ser-256 by PP2A in beta-cells under oxidative stress leading to nuclear retention (By similarity). Phosphorylation of Ser-249 by CDK1 disrupts binding of 14-3-3 proteins leading to nuclear accumulation and has no effect on DNA-binding nor transcriptional activity. Phosphorylation by STK4/MST1 on Ser-212, upon oxidative stress, inhibits binding to 14-3-3 proteins and nuclear export. Ubiquitinated by SRT2. Ubiquitination leads to proteasomal degradation. Methylation inhibits AKT1-mediated phosphorylation at Ser-256 and is increased by oxidative stress (By similarity).

Once in the nucleus, acetylated by CREBBP/EP300. Acetylation diminishes the interaction with target DNA and attenuates the transcriptional activity. It increases the phosphorylation at Ser-256. Deacetylation by SIRT1 results in reactivation of the transcriptional activity. Oxidative stress by hydrogen peroxide treatment appears to promote deacetylation and uncoupling of insulin-induced phosphorylation. By contrast, resveratrol acts independently of acetylation.

**DISEASE:**

Defects in FOXO1 are a cause of rhabdomyosarcoma type 2 (RMS2) [MIM:268220]. It is a form of rhabdomyosarcoma, a highly malignant tumor of striated muscle derived from primitive mesenchymal cells and exhibiting differentiation along rhabdomyoblastic lines. Rhabdomyosarcoma is one of the most frequently occurring soft tissue sarcomas

and the most common in children. It occurs in four forms: alveolar, pleomorphic, embryonal and botryoidal rhabdomyosarcomas. Note=Chromosomal aberrations involving FOXO1 are found in rhabdomyosarcoma. Translocation (2;13)(q35;q14) with PAX3 and translocation t(1;13)(p36;q14) with PAX7. The resulting protein is a transcriptional activator.

**Similarity:**

Contains 1 fork-head DNA-binding domain.

**SWISS:**

Q12778

**Gene ID:**

2308

**Database links:**

[Entrez Gene: 2308](#)Human

[Entrez Gene: 2309](#)Human

[Entrez Gene: 4303](#)Human

[Entrez Gene: 54601](#)Mouse

[Entrez Gene: 56458](#)Mouse

[Entrez Gene: 56484](#)Mouse

[Entrez Gene: 294515](#)Rat

[Entrez Gene: 302415](#)Rat

[Entrez Gene: 84482](#)Rat

[SwissProt: O43524](#)Human

[SwissProt: P98177](#)Human

[SwissProt: Q12778](#)Human

[SwissProt: Q9R1E0](#)Mouse

[SwissProt: Q9WVH3](#)Mouse

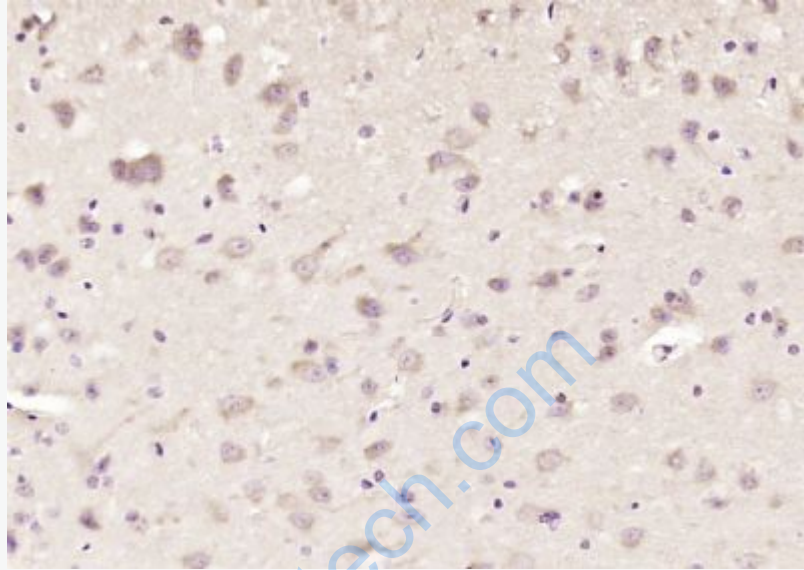
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[Unigene: 370666](#)Human

[Unigene: 584654](#)Human

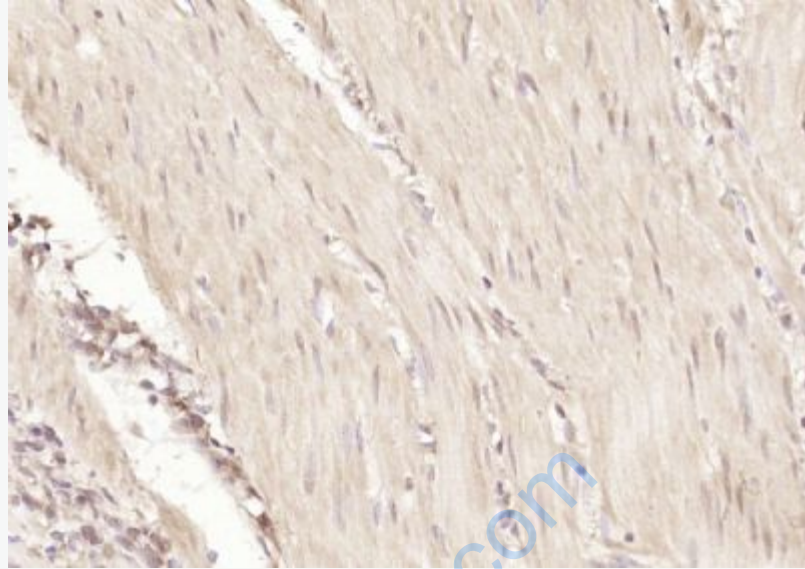
**Important Note:**

This product as supplied is intended for research use only, not for use in human, therapeutic or diagnostic applications.



**Picture:**

Paraformaldehyde-fixed, paraffin embedded (mouse brain); Antigen retrieval by boiling in sodium citrate buffer (pH6.0) for 15min; Block endogenous peroxidase by 3% hydrogen peroxide for 20 minutes; Blocking buffer (normal goat serum) at 37°C for 30min; Antibody incubation with (FOXO1 + FOXO3 + FOXO4) Polyclonal Antibody, Unconjugated (SL7068R) at 1:200 overnight at 4°C, followed by operating according to SP Kit(Rabbit) (sp-0023) instructions and DAB staining.



Paraformaldehyde-fixed, paraffin embedded (human gastric carcinoma); Antigen retrieval by boiling in sodium citrate buffer (pH6.0) for 15min; Block endogenous peroxidase by 3% hydrogen peroxide for 20 minutes; Blocking buffer (normal goat serum) at 37°C for 30min; Antibody incubation with (FOXO1 + FOXO3 + FOXO4) Polyclonal Antibody, Unconjugated (SL7068R) at 1:200 overnight at 4°C, followed by operating according to SP Kit(Rabbit) (sp-0023) instructions and DAB staining.