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FTO Antibody

Catalog # ASC10891

Product Information

Application	WB, IF, E, IHC-P
Primary Accession	Q9C0B1
Other Accession	Q9C0B1, 148841515
Reactivity	Human
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	58282
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	FTO antibody can be used for detection of FTO by Western blot at 1 - 2 g/mL. Antibody can also be used for immunohistochemistry starting at 2.5 g/mL. For immunofluorescence start at 20 g/mL.

Additional Information

Gene ID	79068
Other Names	Alpha-ketoglutarate-dependent dioxygenase FTO, 1.14.11.-, Fat mass and obesity-associated protein, FTO, KIAA1752
Target/Specificity	FTO;
Reconstitution & Storage	FTO antibody can be stored at 4°C for three months and -20°C, stable for up to one year. As with all antibodies care should be taken to avoid repeated freeze thaw cycles. Antibodies should not be exposed to prolonged high temperatures.
Precautions	FTO Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	FTO {ECO:0000303|PubMed:17496892, ECO:0000312|HGNC:HGNC:24678}
Function	RNA demethylase that mediates oxidative demethylation of different RNA species, such as mRNAs, tRNAs and snRNAs, and acts as a regulator of fat mass, adipogenesis and energy homeostasis (PubMed:22002720, PubMed:25452335, PubMed:26457839, PubMed:26458103, PubMed:28002401, PubMed:30197295). Specifically demethylates N(6)-methyladenosine (m6A) RNA, the most prevalent internal modification of messenger RNA (mRNA) in higher eukaryotes (PubMed:22002720, PubMed:25452335, PubMed:26457839, PubMed:26458103, PubMed:30197295). M6A demethylation by FTO affects mRNA expression and

	stability (PubMed:30197295). Also able to demethylate m6A in U6 small nuclear RNA (snRNA) (PubMed:30197295). Mediates demethylation of N(6),2'-O- dimethyladenosine cap (m6A(m)), by demethylating the N(6)-methyladenosine at the second transcribed position of mRNAs and U6 snRNA (PubMed:28002401, PubMed:30197295). Demethylation of m6A(m) in the 5'-cap by FTO affects mRNA stability by promoting susceptibility to decapping (PubMed:28002401). Also acts as a tRNA demethylase by removing N(1)-methyladenine from various tRNAs (PubMed:30197295). Has no activity towards 1-methylguanine (PubMed:20376003). Has no detectable activity towards double-stranded DNA (PubMed:20376003). Also able to repair alkylated DNA and RNA by oxidative demethylation: demethylates single-stranded RNA containing 3-methyluracil, single- stranded DNA containing 3-methylthymine and has low demethylase activity towards single-stranded DNA containing 1-methyladenine or 3- methylcytosine (PubMed:18775698, PubMed:20376003). Ability to repair alkylated DNA and RNA is however unsure in vivo (PubMed:18775698, PubMed:20376003). Involved in the regulation of fat mass, adipogenesis and body weight, thereby contributing to the regulation of body size and body fat accumulation (PubMed:18775698, PubMed:20376003). Involved in the regulation of thermogenesis and the control of adipocyte differentiation into brown or white fat cells (PubMed:26287746). Regulates activity of the dopaminergic midbrain circuitry via its ability to demethylate m6A in mRNAs (By similarity). Plays an oncogenic role in a number of acute myeloid leukemias by enhancing leukemic oncogene-mediated cell transformation: acts by mediating m6A demethylation of target transcripts such as MYC, CEBPA, ASB2 and RARA, leading to promote their expression (PubMed:28017614, PubMed:29249359).
Cellular Location	Nucleus. Nucleus speckle. Cytoplasm Note=Localizes mainly in the nucleus, where it is able to demethylate N(6)-methyladenosine (m6A) and N(6),2'-O-dimethyladenosine cap (m6A(m)) in U6 small nuclear RNA (snRNA), N(1)-methyladenine from tRNAs and internal m6A in mRNAs (PubMed:30197295). In the cytoplasm, mediates demethylation of m6A and m6A(m) in mRNAs and N(1)-methyladenine from tRNAs (PubMed:30197295).
Tissue Location	Ubiquitously expressed, with relatively high expression in adrenal glands and brain; especially in hypothalamus and pituitary (PubMed:17434869, PubMed:17496892). Highly expressed in highly expressed in acute myeloid leukemias (AML) with t(11;11)(q23;23) with KMT2A/MLL1 rearrangements, t(15;17)(q21;q21)/PML-RARA, FLT3-ITD, and/or NPM1 mutations (PubMed:28017614).

Background

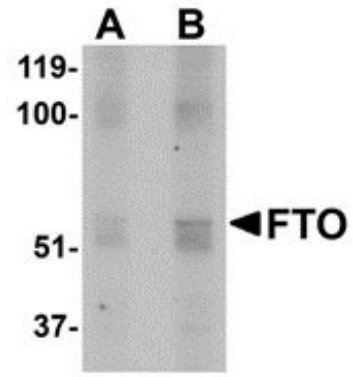
FTO Antibody: Rising obesity rates are rapidly becoming a growing health concern in the developing world. The fat mass and obesity associated gene (FTO) is the first gene discovered to contribute to common forms of human obesity. FTO is a member of the non-heme dioxygenase superfamily, encoding a 2-oxoglutarate-dependent nucleic acid demethylase whose mRNA is widely expressed, especially in neurons of feeding-related nuclei of the brain. FTO mRNA in the arcuate nucleus in mice is up-regulated by feeding and down-regulated during fasting, although the opposite pattern has been observed in rats. At least four isoforms of FTO are known to exist.

References

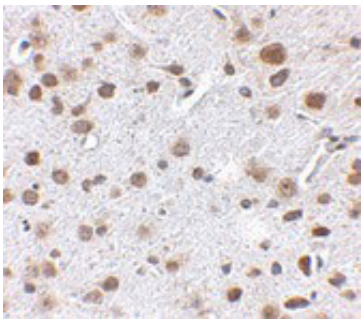
Scuteri A, Sanna S, Chen W-M, et al. Genome-wide association scan shows genetic variants in the FTO gene are associated with obesity-related traits. PloS Genet.2007; 3:e115.
Gerken T, Girard CA, Tung YCL, et al. The obesity-associated FTO gene encodes a 2-oxyglutarate-dependent nucleic acid demethylase. Science2007; 318:1469-72.
Fredriksson R, Hagglund M, Olszewski PK, et al. The obesity gene, FTO, is of ancient origin, upregulated

during food deprivation and expressed in neurons of feeding-related nuclei of the brain. Endocrinology2008; 149:2062-71.
Stratigopoulous G, Padilla S, Leduc CA, et al. Regulation of FTO/FTM gene expression in mice and humans. Am. J. Physiol. Regul. Integr. Comp. Physiol.2008; 294:R1185-96.

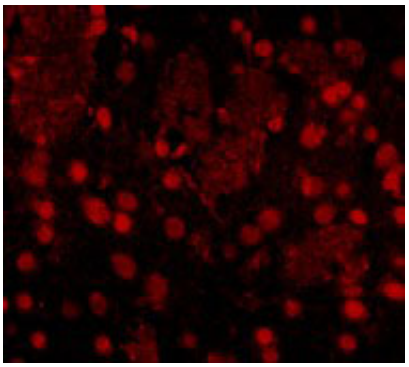
Images



Western blot analysis of FTO in human uterus tissue lysate with FTO antibody at (A) 1 and (B) 2 µg/mL.



Immunohistochemistry of FTO in mouse brain tissue with FTO antibody at 2.5 µg/mL.



Immunofluorescence of FTO in Mouse Brain cells with FTO antibody at 20 µg/mL.