PRODUCT INFORMATION

FTO (human, recombinant)

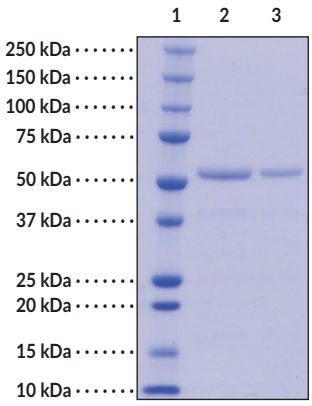
Item No. 26340

Overview and Properties

Synonyms:	Fat Mass- and Obesity-Associated Protein, α-Ketoglutarate-dependent Dioxygenase FTO
Source:	Recombinant N-terminal histidine-tagged FTO (32-505) purified from *E. coli*
Amino Acids:	32-505
Uniprot No.:	Q9C0B1
Molecular Weight:	56.68 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	***batch specific*** (≥80% estimated by SDS-PAGE)
Supplied in:	50 mM HEPES, pH 8.0, with 150 mM sodium choride and 10% glycerol
Protein Concentration:	***batch specific*** mg/ml

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Image



Lane 1: MW Markers
Lane 2: FTO (4 µg)
Lane 3: FTO (2 µg)

Representative gel image shown; actual purity may vary between each batch.

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Description

Fat mass and obesity-associated (FTO) protein is a nuclear-residing N^6-methyladenosine (m^6A) RNA demethylase that is encoded by the *FTO* gene in humans.[1-3] It is composed of an N-terminal domain similar in structure to members of the AlkB non-heme iron-containing dioxygenase family and a C-terminal domain that is not similar to other known domains.[4] The N-terminal domain contains a loop not found in other AlkB proteins that may be responsible for its specificity for single-stranded nucleic acids. *FTO* is highly expressed during development and in the adult brain, adipose tissue, and muscle and its expression is modified by the availability of essential amino acids *in vitro* and following fasting or a chronic high-fat diet *in vivo* in mice.[3,5,6] FTO regulates mRNA splicing and is required for adipogenesis.[1,7] Knockdown of *Fto* in mice increases m^6A-containing transcripts of the adipogenesis-related gene *Runx1t1*, enhances binding of the splicing regulatory protein Srsf2 to *Runx1t1*, which induces the inclusion of *Runx1t1* exon 6 and the production of long *Rnx1t1* transcripts, and leads to inhibition of pre-adipocyte differentiation. Fto is associated with obesity in transgenic mouse models, with overexpression increasing food intake and weight gain and knockout reducing body weight, body length, fat mass, and white adipose tissue, as well as increasing energy expenditure while decreasing locomotor activity.[2] FTO SNPs are associated with body mass index and obesity risk in humans.[6,8]

References

1. Zhao, X., Yang, Y., Sun, B.-F., *et al.* FTO-dependent demethylation of N6-methyladenosine regulates mRNA splicing and is required for adipogenesis. *Cell Res.* **24(12)**, 1403-1419 (2014).
2. Fischer, J., Koch, L., Emmerling, C., *et al.* Inactivation of the *Fto* gene protects from obesity. *Nature* **458(7240)**, 894-899 (2009).
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4. Han, Z., Niu, T., Chang, J., *et al.* Crystal structure of the FTO protein reveals basis for its substrate specificity. *Nature* **464(7292)**, 1205-1209 (2010).
5. Cheung, M.K., Gulati, P., O'Rahilly, S., *et al.* FTO expression is regulated by availability of essential amino acids. *Int. J. Obes. (Lond.)* **37(5)**, 744-747 (2013).
6. Gulati, P., Cheung, M.K., Antrobus, R., *et al.* Role for the obesity-related *FTO* gene in the cellular sensing of amino acids. *Proc. Natl. Acad. Sci. USA* **110(7)**, 2557-2562 (2013).
7. Ben-Haim, M.S., Moshitch-Moshkovitz, S., and Rechavi, G. FTO: Linking m^6A demethylation to adipogenesis. *Cell Res.* **25(1)**, 3-4 (2015).
8. Loos, R.J.F. and Yeo, G.S.H. The bigger picture of *FTO*: The first GWAS-identified obesity gene. *Nat. Rev. Endocrinol.* **10(1)**, 51-61 (2014).

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