

PRODUCT INFORMATION



Leptin (human, recombinant)

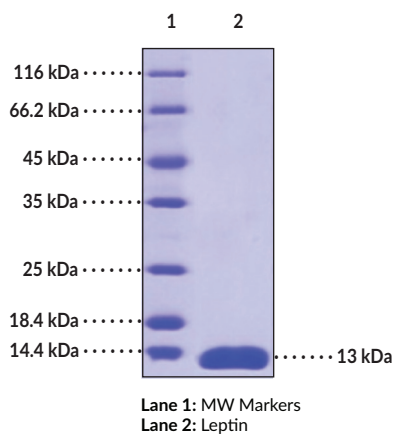
Item No. 31849

Overview and Properties

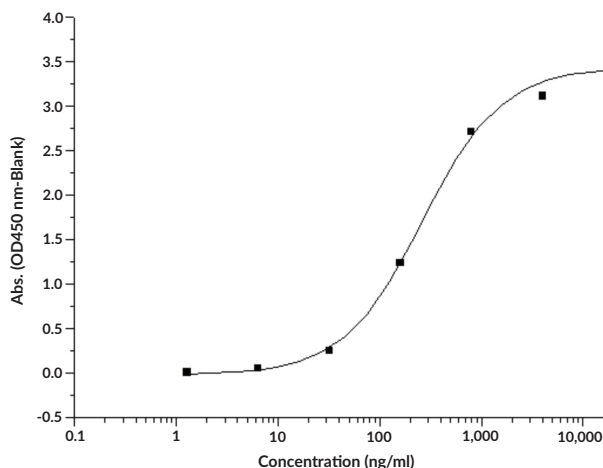
Synonyms: LEPD, Obesity Factor, OBS
Source: Active recombinant human leptin expressed in *E. coli*
Amino Acids: Met1; 22-167
Uniprot No.: P41159
Molecular Weight: 16 kDa
Storage: -80°C (as supplied)
Stability: ≥1 year
Purity: ≥98% estimated by SDS-PAGE
Supplied in: Lyophilized from sterile PBS, pH 7.4
Bioactivity: See figure for details

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

Images



SDS-PAGE Analysis of Leptin. This protein has a calculated molecular weight of 16 kDa. It has an apparent molecular weight of approximately 13 kDa by SDS-PAGE under reducing conditions.



Leptin Binding in a Binding Assay. Immobilized human leptin at 10 µg/ml (100 µl/well) can bind human leptin with a linear range of 0.032-4.0 µg/ml.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

Leptin is a peptide hormone that regulates energy homeostasis, growth, and reproduction, as well as immune function.¹ It is secreted by adipocytes and regulated by nutritional status, where fasting reduces leptin levels and feeding increases leptin levels, as well as in a circadian manner, with serum levels peaking at night.^{2,3} Circulating leptin can bind leptin receptors expressed by peripheral immune cells, such as macrophages, natural (NK) cells, and B and T cells, or be transported across the blood brain barrier, where it binds to neuronally expressed leptin receptors.¹ Binding of leptin to the leptin receptor induces the recruitment and phosphorylation of JAK2, leading to activation of a variety of intracellular signaling cascades, including MAPK-, STAT-, PI3K-, and AMPK-mediated pathways.² Leptin-dependent signaling pathways promote energy expenditure, growth, and reproductive functions, reduce food intake and the production of adrenal corticosteroids, and enhance innate and adaptive immune responses.¹ Leptin-deficient *ob/ob* mice exhibit severe obesity, hyperlipidemia, hyperglycemia, and hyperinsulinemia and are a commonly used model of obesity and type 2 diabetes.⁴ Serum leptin levels are increased in individuals with a variety of conditions, including obesity or insulin resistance.⁵ Cayman's Leptin (human, recombinant) protein can be used for binding assays. The protein was synthesized from a DNA sequence encoding the mature form of human leptin (Val22-Cys167) with an N-terminal translation-initiating methionine (Met1). The expressed protein consists of 147 amino acids, has a calculated molecular weight of 16 kDa, and a predicted N-terminus of Met1.

References

1. Pan, W.W. and Myers, M.G., Jr. Leptin and the maintenance of elevated body weight. *Nat. Rev. Neurosci.* **19(2)**, 95-105 (2018).
2. Münzberg, H. and Morrison, C.D. Structure, production and signaling of leptin. *Metabolism* **64(1)**, 13-23 (2015).
3. Serin, Y. and Tek, N.A. Effect of circadian rhythm on metabolic processes and the regulation of energy balance. *Ann. Nutr. Metab.* **74(4)**, 322-330 (2019)
4. Wang, B., Chandrasekera, P.C., and Pippin, J.J. Leptin- and leptin receptor-deficient rodent models: Relevance for human type 2 diabetes. *Curr. Diabetes Rev.* **10(2)**, 131-145 (2014).
5. Fischer, S., Hanefeld, M., Haffner, S.M., *et al.* Insulin-resistant patients with type 2 diabetes mellitus have higher serum leptin levels independently of body fat mass. *Acta Diabetol.* **39(3)**, 105-110 (2002).

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