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PRODUCT INFORMATION



ACSL1 (human, recombinant; aa 48-698)

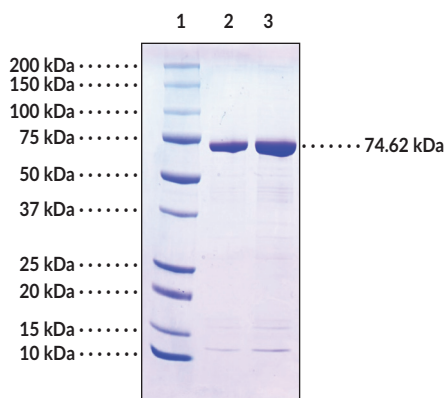
Item No. 40418

Overview and Properties

Synonyms:	Acyl-CoA Synthetase Long-chain Family Member 1, FAFL1, Fatty Acid CoA Ligase 1, LACS1, Long-chain Fatty Acid-CoA Ligase 1, Palmitoyl-CoA Ligase 1
Source:	Active recombinant human N-terminal His-tagged ACSL1 expressed in <i>E. coli</i>
Amino Acids:	48-698
Uniprot No.:	P33121
Molecular Weight:	74.62
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥90% estimated by SDS-PAGE
Supplied in:	50 mM Tris, pH 8.0, with 150 mM sodium chloride and 10% glycerol
Protein Concentration:	<i>batch specific</i> mg/ml
Activity:	<i>batch specific</i> U/ml
Specific Activity:	<i>batch specific</i> U/mg
Unit Definition:	One unit is defined as the amount of enzyme required to measure the change of free fatty acid concentration in μM per minute at 37 °C.

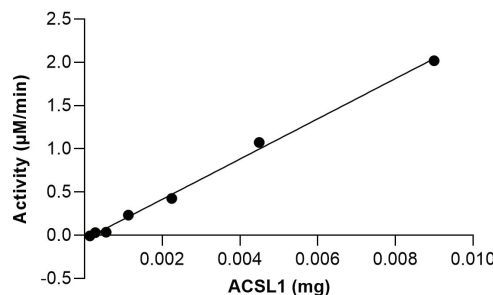
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: ACSL1 (2 μg)
Lane 3: ACSL1 (4 μg)

SDS-PAGE Analysis of ACSL1.



ACSL1 enzyme activity was determined using Cayman's Free Fatty Acid Fluorometric Assay Kit (Item No. 700310) with 100 μM oleic acid as the substrate.

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
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PRODUCT INFORMATION



Description

Acyl-CoA synthetase long-chain family member 1 (ACSL1) is a long-chain acyl-CoA synthase that converts both saturated and unsaturated fatty acids into fatty acyl-CoA esters.¹⁻³ It is expressed in liver, heart, adipose tissue, and muscle and, in the presence of TANK-binding kinase 1 (TBK1), localizes to the mitochondria where it promotes fatty acid β -oxidation.^{4,5} In the absence of TBK1, ACSL1 is localized to the endoplasmic reticulum (ER) and facilitates lipid accumulation.⁴ ACSL1 has broad substrate specificity for 16- and 18-carbon saturated fatty acids and 16-20-carbon unsaturated fatty acids.⁵ ACSL1 knockdown suppresses palmitate-induced increases in the inflammatory markers TNF- α , IL-1 β , and CD11c and inhibits lipid accumulation and the transition into foam cells in THP-1 macrophages, as well as inhibits ferroptosis induced by α -eleostearic acid (9(Z),11(E),13(E)-octadecatrienoic acid (Item No. 10008349) in BT-549 cells.^{6,7} Levels of ACSL1 are increased in liver, breast, ovarian, and colorectal cancers compared with non-cancerous tissues.¹ Cayman's ACSL1 (human, recombinant; aa 48-698) protein can be used for ELISA, enzyme activity, and Western blot (WB) applications.

References

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4. Huh, J.Y., Reilly, S.M., Abu-Odeh, M., *et al.* TANK-binding kinase 1 regulates the localization of acyl-CoA synthetase ACSL1 to control hepatic fatty acid oxidation. *Cell Metab.* **32(6)**, 1012-1027 (2020).
5. Singh, A.B., Dong, B., Xu, Y., *et al.* Identification of a novel function of hepatic long-chain acyl-CoA synthetase-1 (ACSL1) in bile acid synthesis and its regulation by bile acid-activated farnesoid X receptor. *Biochim. Biophys. Acta Mol. Cell Biol. Lipids* **1864(3)**, 358-371 (2019).
6. Al-Rashed, F., Haddad, D., Al Madhoun, A., *et al.* ACSL1 is a key regulator of inflammatory and macrophage foaming induced by short-term palmitate exposure or acute high-fat feeding. *iScience* **26(7)**, 107145 (2023).
7. Beatty, A., Singh, T., Tyurina, Y.Y., *et al.* Ferroptotic cell death triggered by conjugated linolenic acids is mediated by ACSL1. *Nat. Commun.* **12(1)**, 2244 (2021).