Lecithin-cholesterol acyltransferase (LCAT)

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Description
High density lipoprotein (HDL) plays an important role in reverse cholesterol transport, a process by which excess cholesterol from peripheral tissues is returned to the liver for use or excretion. There is a strong inverse correlation between plasma HDL cholesterol concentration and the incidence of atherosclerosis. Lecithin-cholesterol acyltransferase (LCAT) performs a central role in HDL metabolism by catalyzing the formation of cholesteryl esters on HDL through the transfer of fatty acids from the sn-2 positions of phosphatidylcholine (PC) to cholesterol (1–3).

Pathophysiology
Genetic deficiencies of human LCAT have been recently reviewed by Kuivenhoven et al. Briefly, two classes of genetic deficiencies are known: familial LCAT deficiency (FLD) and fish-eye disease (FED). FLD is caused by either null or missense mutations; in Class 1 defects, null mutations cause total loss of catalytic activity and virtual absence of LCAT mass, whereas in Class 2, missense mutations are characterized by loss of activity and either normal, reduced, or absent LCAT mass. FED is caused by missense mutations only; these mutations affect either LDL or HDL activity in Class 3 defects, and LCAT mass is reduced. In Class 4 defects, the missense mutations are associated with partial loss of activity against HDL only, and reduced LCAT mass. Direct measurement of the enzyme mass and activity may contribute to the differentiation of LCAT defects.

A specific and sensitive enzyme immunoassay for human plasma and serum LCAT is a useful tool to clarify the physiological role of LCAT and to clinically investigate LCAT deficiency syndrome, and it can be used for diagnostic purposes related to liver function.

References
**Principle of the assay**

The LCAT ELISA kit is intended for the quantitative determination of lecithin-cholesterol acyltransferase (LCAT) in human serum and plasma by utilizing a two-step sandwich method of enzyme-linked immuno-sorbent assay (ELISA).

Test wells are coated with anti-LCAT mAb (clone 36486, epitope C-terminus of LCAT), which binds with LCAT in the sample. After the first incubation and washes to remove all of the unbound material, horseradish peroxidase (HRP)-labeled anti-LCAT mAb (clone 36487, epitope located in the center of the LCAT primary structure) is added. The enzyme labeled mAb (36487) binds with LCAT immobilized on the well by the coated mAb (36486). After the second incubation and subsequent washes, the antibody / LCAT / enzyme complex is incubated with a substrate solution and terminated with a stop reagent. The intensity of color that develops in the enzyme reaction is measured by using a microplate reader. The absorbance is proportional to the concentration of LCAT in the sample.

**References**


**Key Features**

- **Format:** 96-well plate
- **Sample type:** human plasma and serum
- **Reference range:** 5.0 ~ 10.3 μg/ml (n = 60)
- **Linearity:** 0.5 ~ 35 μg/ml
- **Sensitivity:**
  - 0 μg/ml ≤ 0.15 Abs
  - 7.5 μg/ml 0.2 ~ 0.8 Abs
- **Specificity:** 85 ~ 115% of expected value
- **Reproducibility:** CV value less than 10%
- **Shelf life:** 24 months