

PRODUCT DATA SHEET

Long Chain Fatty Acid Methyl Ester Mixture

Catalog No: 2011

Concentration: 25mg/ml

Solvent: Methylene chloride

Storage: -20°C

GC Conditions:

Column: RTX-1 or SPB-1, 30 meter

Oven: 290°C

Carrier: Helium @ 30cm/sec.

Detector: FID, 315 °C

Injector: 250°C

C24:0 Methyl tetracosanoate	20%
C26:0 Methyl hexacosanoate	20%
C28:0 Methyl octacosanoate	20%
C30:0 Methyl triacontanoate	20%
C32:0 Methyl dotriacontanoate	20%

Application notes:

Very-long-chain fatty acids (VLCFA) consisting of 26 carbons or more comprise a small but very important group of biological lipids that are found in both plants and animals. There is relatively little known about VLCFA, especially those with more than 30 carbons, and the need for high purity standards to explore their mechanisms and processes is greatly needed. VLCFA are found in small amounts in most animal tissues and are especially abundant in the brain, skin, testis, and some glands, such as the meibomian gland.

The recognition of VLCFA in human diseases has recently sparked a renewed interest in the investigation of these crucial compounds. VLCFA are implicated in several diseases and standards for the determination of the lipids associated with these diseases are needed. One of these human diseases, X-linked adrenoleukodystrophy, causes an increase in plasma of VLCFA due to a genetic defect that affects the peroxisomal assembly and contributes to severe pathological changes such as inflammatory responses; This disease can also lead to neurological changes and severe demyelination. Another disease that results in unusually high levels of VLCFA is Zwellerger syndrome which is characterized by a reduced number of, and morphologically-abnormal, peroxisomes.¹

In plants VLCFA are converted to long chain hydrocarbons which are used to make waxes that are essential to their survival.^{2,3} VLCFA acylated to sphingolipids are critical in many biological functions⁴ and substantial amounts are found to be amide-linked to the long-chain sphingoid base sphinganine, forming a ceramide, which constitutes the lipid backbone of sphingomyelin and other sphingolipids. VLCFA can often be found in esterified linkages with cholesterol, gangliosides, galactocerebrosides, sphingomyelin, and phosphatidylcholine. In myelin VLCFA are important in increasing the structural stability. Lipids are very important in signaling and the influence of VLCFA in signaling needs to be further explored.⁵

Studies that explore the roles of VLCFA acylated to phospholipids, sphingolipids and glycerolipids or esterified to triglycerides, sterols, and other compounds show great promise in revealing much about the various biological functions of these lipids. If you require VLCFA acylated or esterified to a specific backbone the team at Matreya will be happy to synthesize them for you.

Selected References:

1. H. Moser et al. "Adrenoleukodystrophy, Increased plasma content of saturated very long chain fatty acids" *Neurology*, Vol. 51(2) pp. 334-334-a, 1998
2. A. Millar, L. Kunst "Very-long-chain fatty acid biosynthesis is controlled through the expression and specificity of the condensing enzyme" *The Plant Journal*, Vol. 12(1) pp. 121-131, 1997
3. A. Millar et al. "*CUT1*, an Arabidopsis Gene Required for Cuticular Wax Biosynthesis and Pollen Fertility, Encodes a Very-Long-Chain Fatty Acid Condensing Enzyme" *Plant Cell*, Vol. 11 pp. 825-838, 1999
4. P. Tvrđika et al. "Role of a New Mammalian Gene Family in the Biosynthesis of Very Long Chain Fatty Acids and Sphingolipids" *Journal of Cell Biology*, Vol. 149(3) pp. 707, 2000
5. A. Poulos "Very long chain fatty acids in higher animals—A review" *Lipids* Vol. 30(1) pp. 1-14, 1995

This chemical is for investigational use only. This chemical is not for human consumption or to be used in food or food additives. Matreya assumes no liability for any use of this chemical by the end user. We believe the information, offered in good faith, is accurate.