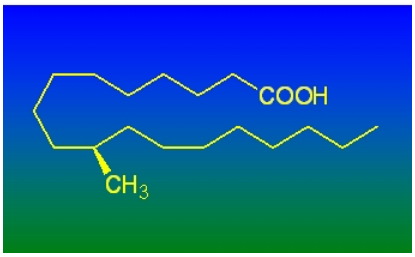
Lipid of the Month: January 2010

Tuberculostearic acid



Anderson and Chargaff in 1929 reported the presence of a new saturated fatty acid in lipids extracted from human tubercle bacilli (1). The compound was named "tuberculostearic acid" and was subsequently shown to have the structure 10(*R*)-methyloctadecanoic acid (2,3). Several chemical syntheses of this branched chain fatty acid in racemic and optically active form have been published (see ref. 4 and references therein). Biosynthesis of tuberculostearic acid takes place from phospholipid-bound oleate, which is methylated to the 10-methylene derivative by S-adenosylmethionine and subsequently reduced by NADPH (5-7).

Tuberculosis is a globally spread infectious disease causing about 2 million deaths per year. The incidence of tuberculosis in Sweden has leveled off during many decades, however, in recent years about 500 new cases per year have been recorded and a 15% increase in incidence is being reported for the year 2009.

Current interest in tuberculostearic acid is focussed on its use as a marker to help diagnosing tuberculosis. To this end several sensitive methods based on GLC or GC-MS have been developed, *e.g.* for determination of tuberculostearic acid in samples of sputum during pulmonary tuberculosis (8). Additionally, the effect of the anti-tuberculosis drug Isoxyl on the formation of oleate and tuberculostearate has been studied (9).

Tuberculostearic acid (A-1810) supplied by Lipidox is the racemic 10-methylstearate. Also available is *cis*-9,10-methyleneoctadecanoic acid (dihydrosterculic acid; A-1910).

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