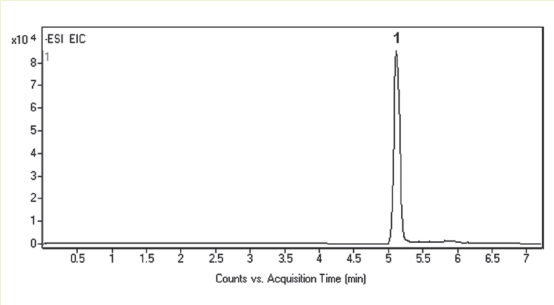
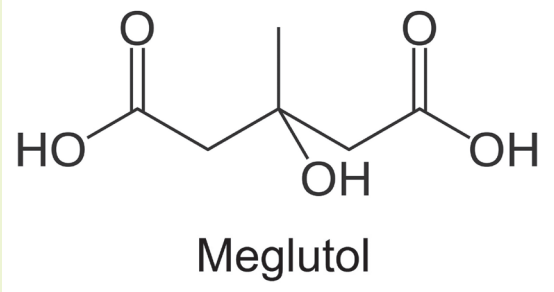
3-Hydroxy-3-Methylglutaric Acid (HMG) in Urine

Important biomarker for diabetes and HMG disorder





Meglutol

Note: When a set of plasma samples was analyzed, the concentrations of 3-hydroxy-3-methylglutaric acid were significantly higher in diabetic patients than those of healthy controls. For this reason it is important to develop a reliable analytical method for the analysis of this compound. The increased level in urine of this metabolite is also observed in an inborn disease 3-hydroxy-3-methylglutaric aciduria. Early detection is crucial for successful treatment.

Method Conditions

Column: Cogent Diamond Hydride™, 4µm, 100Å

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150 mm

Solvent: A: DI H_2O / 10 mM ammonium formate
B: 95% acetonitrile / 5% DI water / 10 mM ammonium formate (v/v)

Gradient:

time (min.)	%B
0	95
1	95
5	30
7	30
8	95

Post Time: 3 min

Injection vol.: 1 microL

Flow rate: 0.4 mL/min

Detection: ESI – NEG - Agilent 6210 MSD TOF mass spectrometer

Peak: 1. 3-hydroxy-3-methylglutaric acid 161.0455 m/z $[M-H]^-$ in urine sample

t_0: 0.9 min

Discussion

A selective, specific, and sensitive method based on LC–MS analysis has been developed for the determination of 3-hydroxy-3-methylglutaric acid (a.k.a. meglutol) in urine samples. The method can be also used in the analysis of plasma samples after precipitation of plasma proteins with acetonitrile. The retention was achieved using a Cogent Diamond Hydride column.

This method can be used for screening of large numbers of urine or plasma samples, due to simple sample preparation and rapid equilibration of the Cogent columns when gradient analysis is used.

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