Lipidomic Analysis Based on Normal-phase HPLC/mass Spectrometry

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A Christie's normal-phase HPLC method (J. Lipid Res. 26, 507-512, 1985) allows separation of lipid classes of a wide polarity from cholesterol esters to lysophosphatidylcholine on a single chromatographic run. To hyphenate this attractive method to an electrospray ionization/ion-trap mass spectrometer, needed are a solvent system that ensures both a resolving power and a high ionization efficiency and HPLC pumps that stably deliver non-polar solvents at a low flow rate suitable for a small-bore column. We have developed such an automated system and have been extensively using for lipidomic analyses of studying on lipid anomalies of gene-targeted mice and clinical problems for a few years. In this paper, I present the results of lipidomic analysis of murine epidermal barrier-competent ceramides, glucosylceramides and sphingomyelins using the developed system.