A NEW APPROACH TO CLASSIFYING CHD IN NORMOLIPOEMIC INDIVIDUALS USING HIGH PERFORMANCE LIPOPROTEIN DENSITY PROFILING

Objective: Establish a high accuracy protocol for classifying individuals with high HDL and normal LDL for CHD based on their lipoprotein density profile.

Equilibrium Density Gradient Ultracentrifugation

NaBIEDTA

Density Gradient Theory

Compared to Density Gradients

Using Different Metal ions

Original NaBIEDTA Repeatability

Improved Repeatability for NaBIEDTA Gradient

Tube Orientation

Increased Gradient Volume

Statistical Separation Analysis of CVD Patients

Figure 1: 10 HPLD Profiles of a Serum Sample - Overlaid 100µL, 5.18M NaBIEDTA, 6µL Serum, 15µL HBD C6-Ceramide, 200µL H2O Layered

Study Parameters:

Sample Size: 10 patients
Control: 15 Controls, 15 CVD

Controls:
Normal LDL Cholesterol, Normal LDL Cholesterol
Clear Angiogram

CVD:
Elevated LDL Cholesterol, Elevated LDL Cholesterol
Documented Atherosclerosis

LDA and SAVE results are Independent of:
Gender, Smoking Habits, Diabetes

Study Results:

SAVE Analysis:
Shows test groups being nearly disjoint in relation to each other.

Most important variables:
SAVE1: HDL > 9 and HDL < 9
SAVE2: HDL > 9 and HDL > 9

LDA:
Separates 83.3% of 30 samples correctly as CVD or Control.

Most important variables:
LDL > 9 and LDL > 9

Classification obtained with only a small sample size

HPLD Advantages:

Need only 6µL Serum Sample

Hands-on sample preparation time of 15 minutes

Homogenous gradient that doesn’t require layering steps during test

Sub-class isolation allows for further studies on desired lipoprotein fractions

6-hour spin time in ultracentrifuge

10 samples per run

References:

