

第6回未病臨床検査セミナー

2007年9月30日 橘桜会館

～HPLC 法による超悪玉コレステロール(小型LDL)の測定～

ランチョンセミナー：(株)スカイライト・バイオテック

**内臓脂肪蓄積により増加する小型LDL-CのHPLC解析は、
動脈硬化やメタボリックシンドロームの潜在的リスクの早期判定に役立つ**

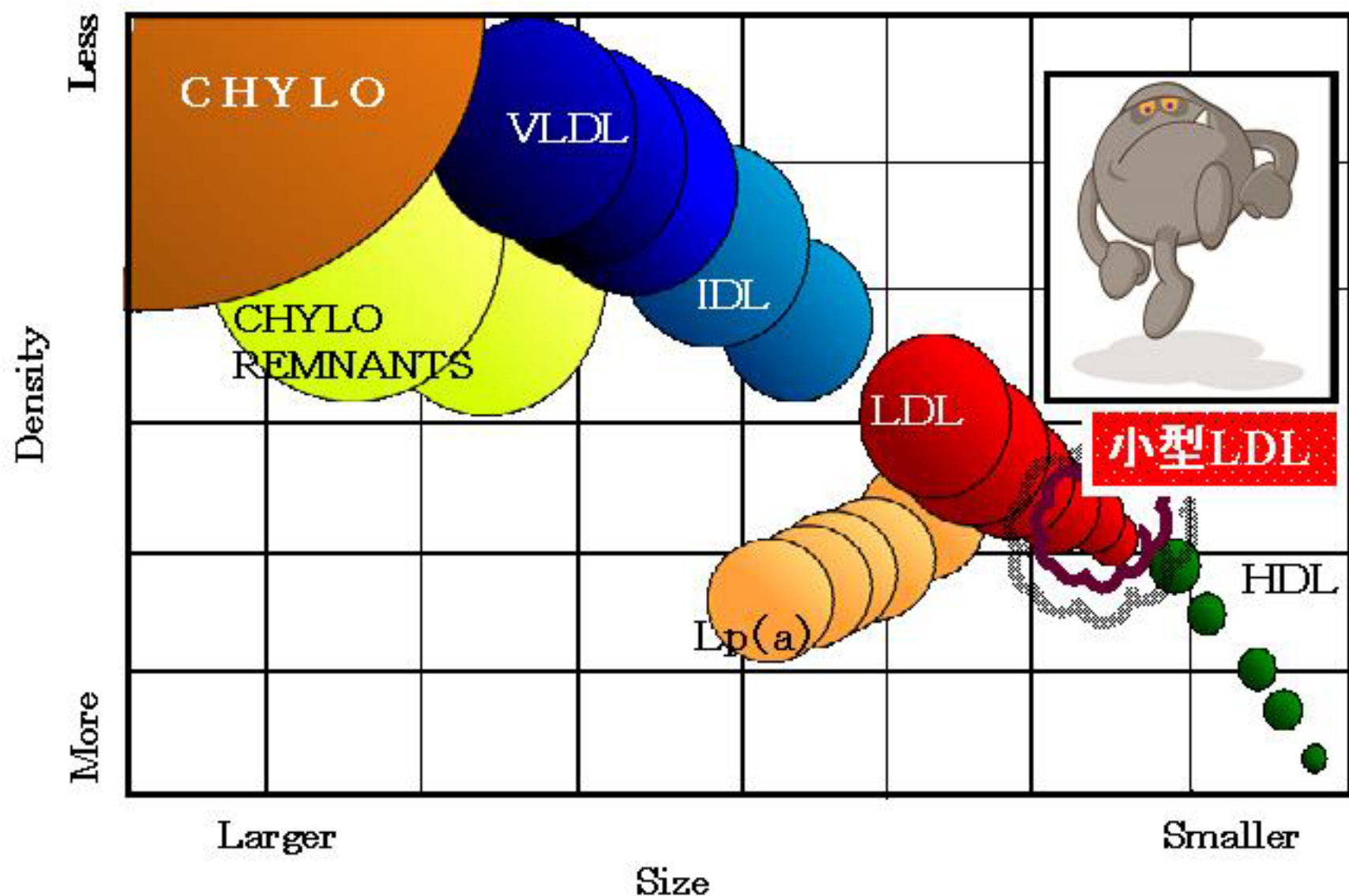


司会 加瀬澤 信彦
(静岡健康管理センター)

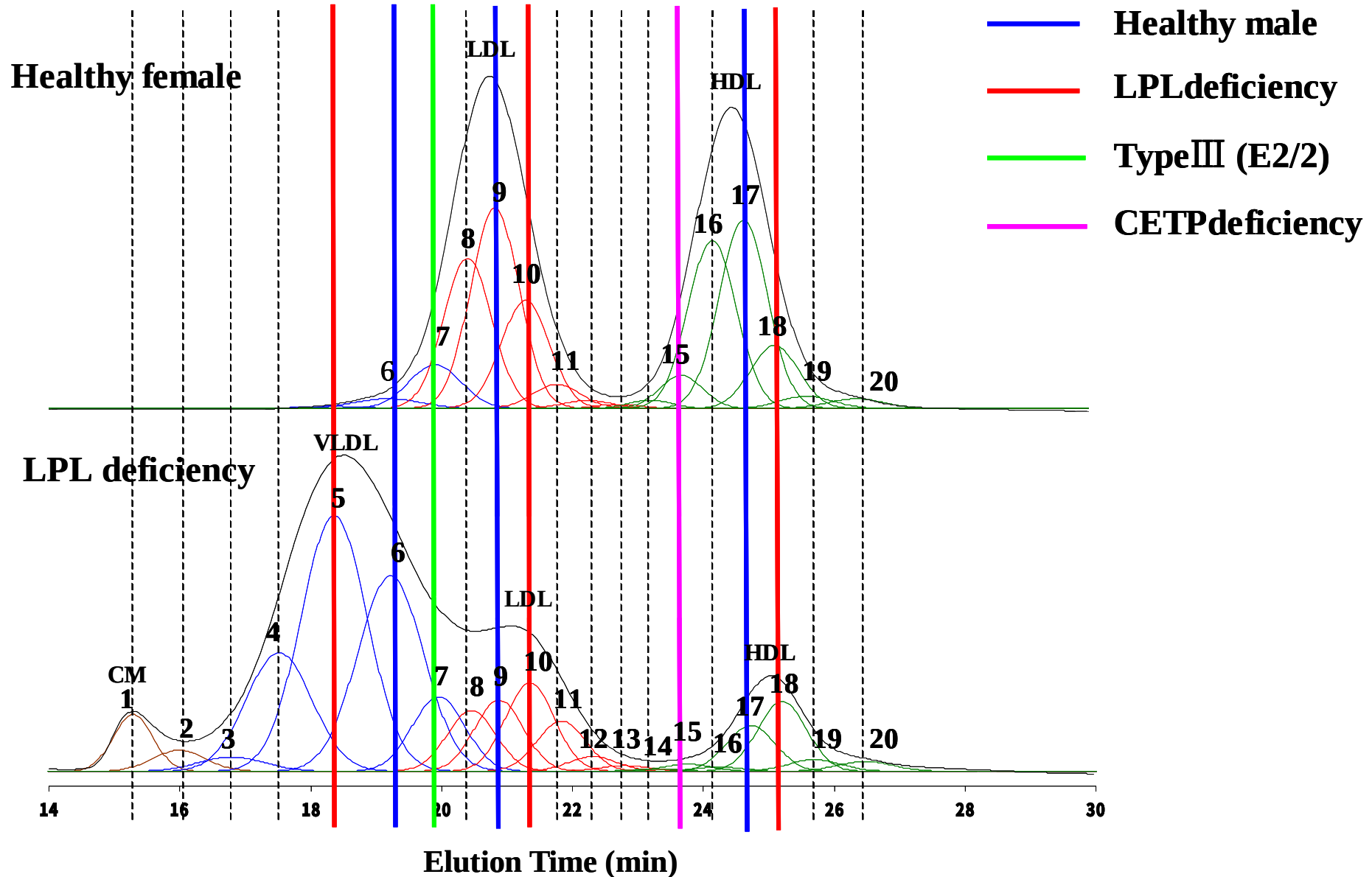


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リポタンパク質の比重と大きさ



Component peaks for subclasses analysis by HPLC



Definition of major lipoproteins and their subclasses by an HPLC method

Major Class	CM >80 nm		VLDL: 30 - 80 nm					LDL: 16 - 30 nm				HDL: 8 - 16 nm								
Component peak No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particle Diameter (nm)	>90	75	64	53.6	44.5	36.8	31.3	28.6	25.5	23.0	20.7	18.7	16.1	14.0	12.1	10.9	9.8	8.8	7.6	
Subclass Name			large VLDL			medium VLDL	small VLDL	large LDL	medium LDL	small LDL	very small LDL	very large HDL			large HDL	medium HDL	small HDL	very small HDL		

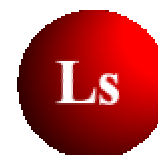
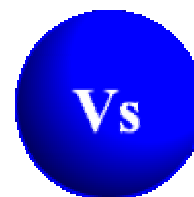
小型LDL



小型LDL

心疾患におけるサブクラスのコレステロール量

Subclasses	CAD (n=45)			non CAD (n=17)		
	mean	±	SD	mean	±	SD
large VLDL	4.3	±	3.6	4.0	±	4.0
medium VLDL	11.1	±	6.0	9.6	±	5.9
small VLDL	12.5	±	3.8	8.7	±	3.5
large LDL	34.0	±	10.9	29.7	±	8.3
medium LDL	48.9	±	12.0	42.6	±	9.9
small LDL	28.6	±	9.7	23.4	±	6.2
very small LDL	10.2	±	3.9	7.5	±	1.8
very large HDL	2.7	±	1.3	3.1	±	1.5
large HDL	8.4	±	5.2	14.6	±	8.3
medium HDL	15.9	±	4.4	16.8	±	4.4
small HDL	11.8	±	3.1	11.2	±	3.7
very small HDL	4.6	±	1.2	4.3	±	1.0



*** ↑↑

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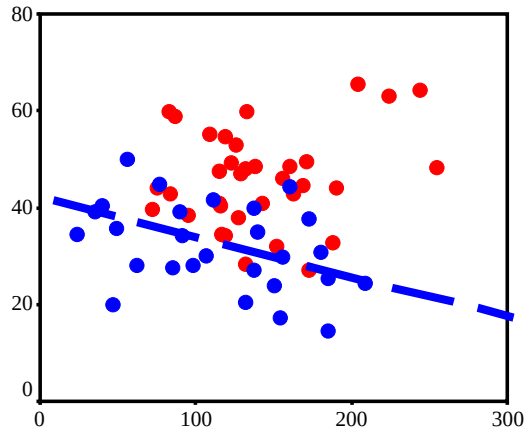
*** $P < 0.001$, * $P < 0.05$

新しいリスク指標の提案: Vs + Ls - Hs

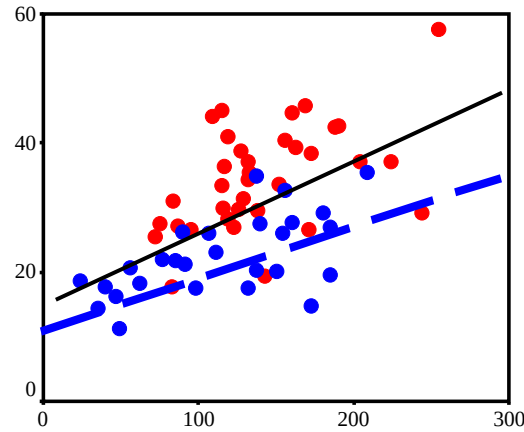
LDLサブクラスと内臓脂肪および皮下脂肪面積

内臓脂肪面積

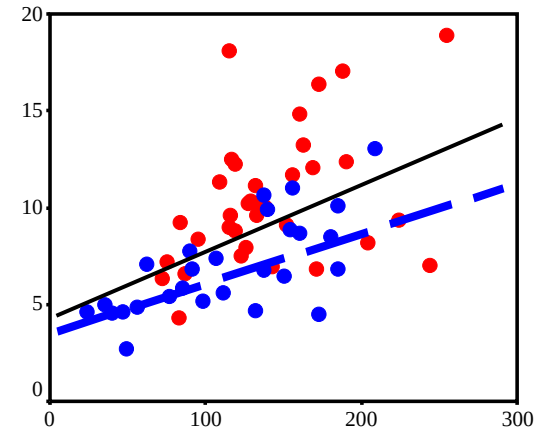
Large LDL-C



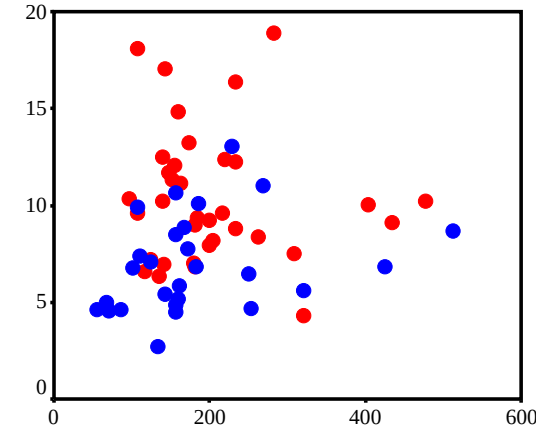
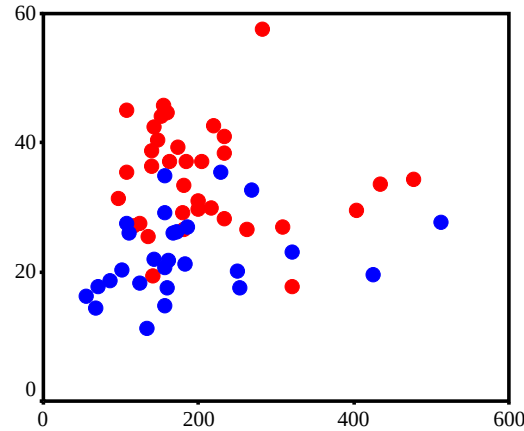
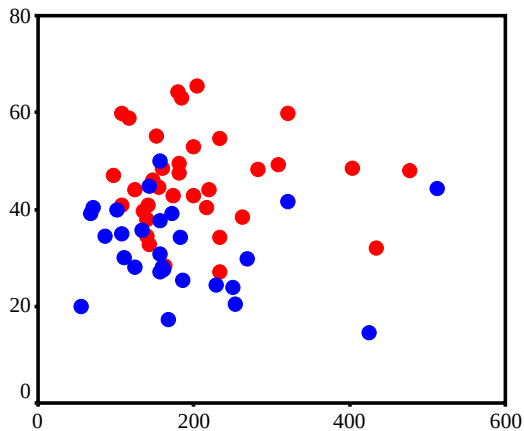
Small LDL-C



Very Small LDL-C



皮下脂肪面積



● LDL-C < 130mg/dl (n=31)

● LDL-C ≥ 130mg/dl (n=31)

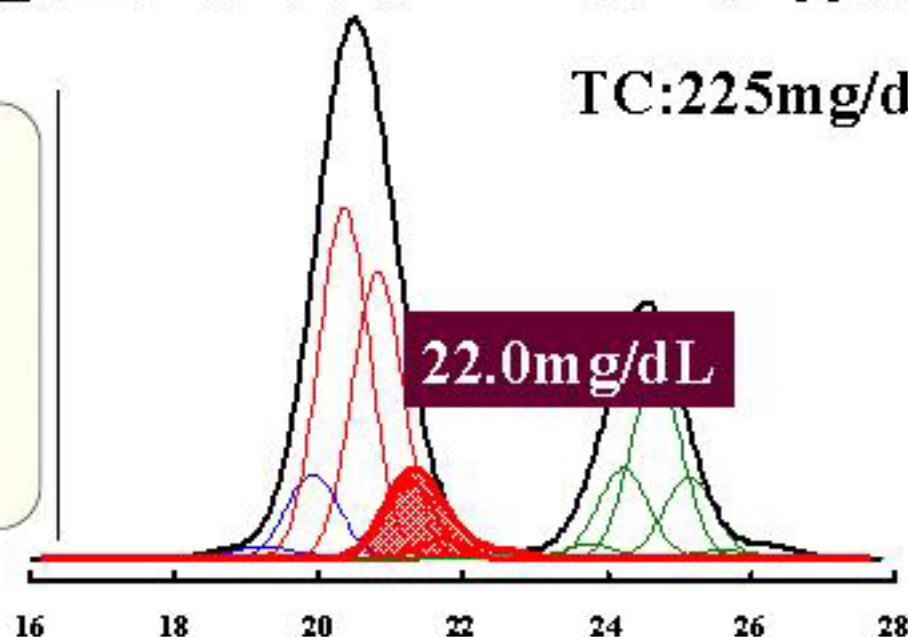
内臓脂肪の蓄積による悪玉コレステロールの増加



受診者 Aさん
33歳・男性

BMI=29.1
総コレステロール=225mg/dL
LDLコレステロール=129mg/dL
CT測定による内臓脂肪面積=83cm²

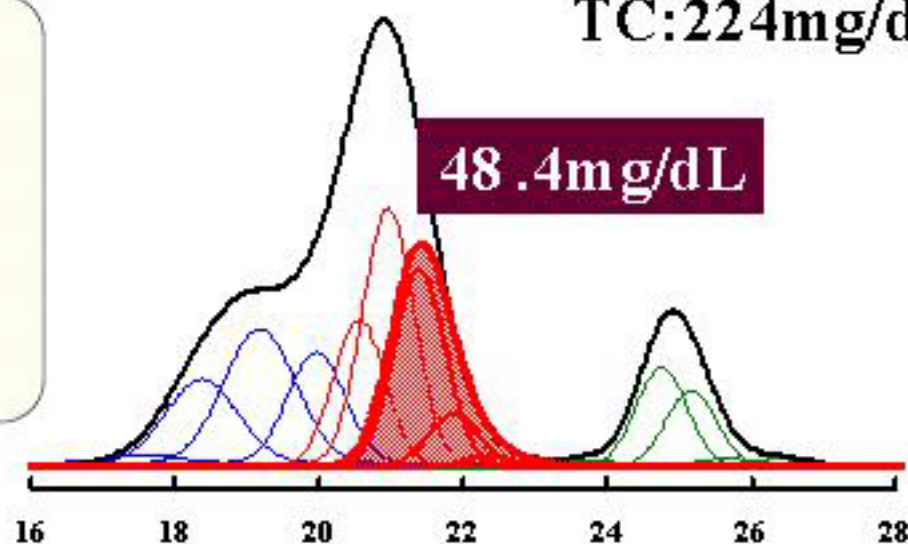
TC:225mg/dL



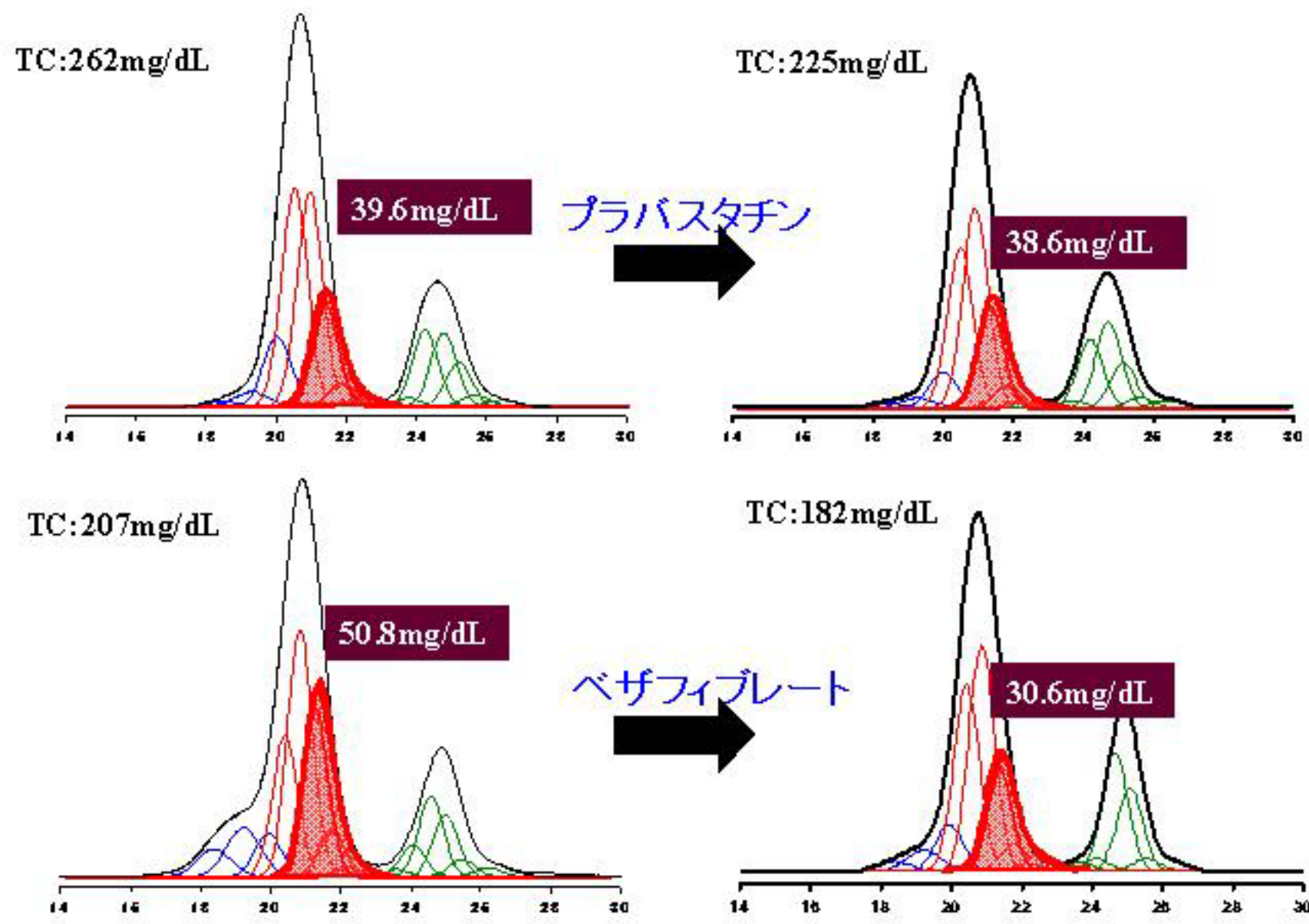
受診者 Bさん
47歳・男性

BMI=30.8
総コレステロール=224mg/dL
LDLコレステロール=117mg/dL
CT測定による内臓脂肪面積=209cm²

TC:224mg/dL



脂質低下薬剤によるsmall-LDLコレステロールの変化



PERSISTENCE

Clin. Chem. 35: 173-173 (1983)

1983年 Priority

Serum Lipoprotein Measurement—Liquid Chromatography and Sequential Floatation (Ultracentrifugation) Compared

Mitsuyo Okazaki,¹ Hiroshige Itakura,² Keiko Shiraishi,¹ and Ichiro Hara¹

An HPLC method [*J. Biochem. (Tokyo)* 91:1381, 1982] was used for evaluating serum lipoproteins, with on-line monitoring of either cholesterol or phospholipids. Five well-distinguished lipoprotein fractions were observed, based on their particle sizes. Serum of 15 normal persons, 12 subjects with various types of hyperlipidemia, 20 patients with various liver

Clinical Chemistry 43:10
1885-1890 (1997)

1997年 Validation

Evaluation of precipitation and direct methods for HDL-cholesterol assay by HPLC

MITSUYO OKAZAKI,* KEIKO SASAMOTO, TOSHIO MURAMATSU, and SEIJIN HOSAKI[†]

HDL-cholesterol (HDL-C) determination by precipitation (sodium phosphotungstate) and direct methods were compared with a new column (TSKgel HPLC) (TSK column 1P-1). The HPLC

Clinical Chemistry 46:1
63-72 (2000)

2000年

Lipids, Lipoproteins,
and Cardiovascular
Risk Factors

Assessment of Between-Instrument Variations in a HPLC Method for Serum Lipoproteins and Its Traceability to Reference Methods for Total Cholesterol and HDL-Cholesterol

SHINICHI USUI,¹ MASAKAZU NAKAMURA,² KAZUHIRO JITSUKATA,³ MASAYUKI NARA,⁴ SEIJIN HOSAKI,¹ and MITSUYO OKAZAKI^{4*}

2006年 Clinical Significance

Clinical Chemistry 52:11
2049-2053 (2006)

Component Analysis of HPLC Profiles of Unique Lipoprotein Subclass Cholesterols for Detection of Coronary Artery Disease

MITSUYO OKAZAKI,^{1*} SHINICHI USUI,² AKIO FUKUI,² ISAO KUBOTA,³ and HITONOBU TOMOIKE⁴

Background: Patients with coronary artery disease (CAD) are known to have several lipoprotein abnormalities. We examined plasma cholesterol concentrations of major lipoproteins and their subclasses, using a gel permeation HPLC, to establish an association between a

Conclusions: These results suggest the usefulness of multiple and simultaneous subclass analysis of proatherogenic and antiatherogenic lipoproteins and indicate that HPLC and its component analysis can be used for easy detection and evaluation of abnormal



ご清聴ありがとうございました

