Analysis Report

Bruker IVDr Lipoprotein Subclass Analysis B.I.LISA™

Sample ID: HB-COVID0001_expno10.100000.15r

Measuring Date: 01-Jul-2020 14:55:49
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Model Version: PL-5009-01/001

Disclaimer

RESEARCH USE ONLY: This is no clinical diagnostic analysis report. Must not be used for clinical (medical or IVD) diagnosis or for patient management! Additional concentration range information (95% range of model) provided numerically or graphically in this report must not be used for clinical diagnostic interpretation.

Main Parameters

Key	Parameter	Value	Unit	95% Range of Model	Graphics (*)
TPTG	TG	140	mg/dL	53 - 490	
TPCH	Chol	204	mg/dL	140 - 341	
LDCH	LDL-Chol	116	mg/dL	55 - 227	
HDCH	HDL-Chol	46	mg/dL	35 - 96	
TPA1	Apo-A1	112	mg/dL	112 - 217	
TPA2	Apo-A2	26	mg/dL	24 - 48	
TPAB	Apo-B100	119	mg/dL	48 - 160	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

Calculated Figures

Key	Parameter	Value	Unit	95% Range of Model	Graphics (*)
LDHD	LDL-Chol/HDL-Chol	2,51	-/-	0,98 - 4,08	
ABA1	Apo-B100/Apo-A1	1,07	-/-	0,30 - 1,07	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

Concentrations of ApoB carrying Lipoprotein Particles (calculated)

Concentrations of VLDL, IDL and LDL particles are calculated from respective Apo-B100 concentrations compiled in the this report taking into account that each VLDL, IDL and LDL particle carries one apolipoprotein B100 molecule, only.

Total Concentration of ApoB carrying Particles

Key	Parameter	Value	Unit	95% Range of Model	Graphics (*)
TBPN	Total Particle Number	2167	nmol/L	876 - 2908	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

Lipoprotein Main Fractions

Key	Parameter	Value	Unit	95% Range of Model	Graphics (*)
VLPN	VLDL Particle Number	237	nmol/L	50 - 473	
IDPN	IDL Particle Number	159	nmol/L	36 - 316	
LDPN	LDL Particle Number	1724	nmol/L	760 - 2560	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

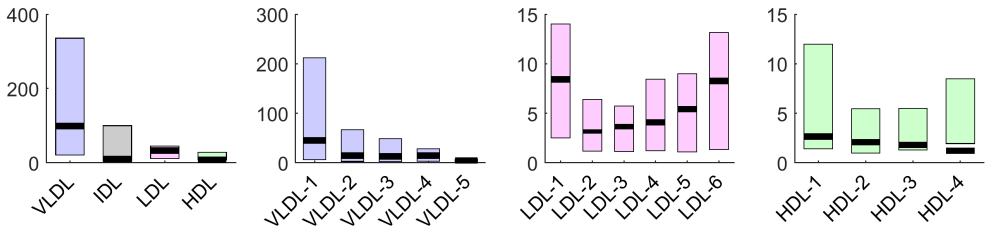
LDL Subfractions

Key	Parameter	Value	Unit	95% Range of Model	Graphics (*)
L1PN	LDL-1 Particle Number	230	nmol/L	98 - 567	
L2PN	LDL-2 Particle Number	160	nmol/L	47 - 427	
L3PN	LDL-3 Particle Number	124	nmol/L	51 - 499	
L4PN	LDL-4 Particle Number	136	nmol/L	77 - 577	
L5PN	LDL-5 Particle Number	395	nmol/L	86 - 615	
L6PN	LDL-6 Particle Number	658	nmol/L	91 - 815	

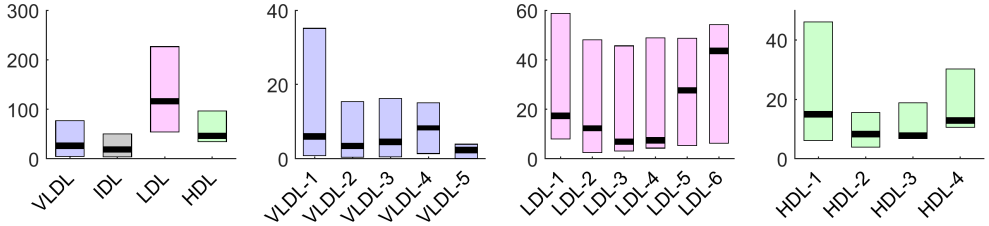
(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

Lipid Distribution Overview

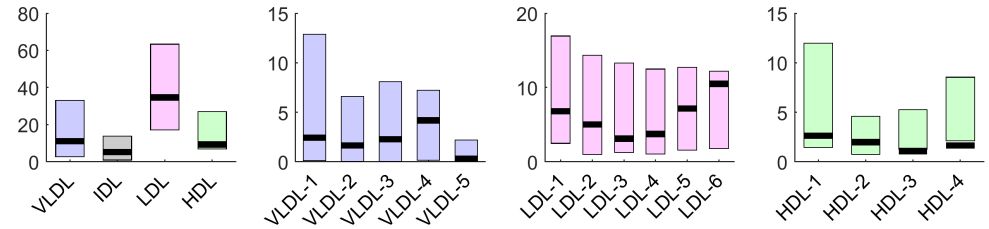
Triglycerides distribution (concentrations in mg/dL together with 95% range of model)



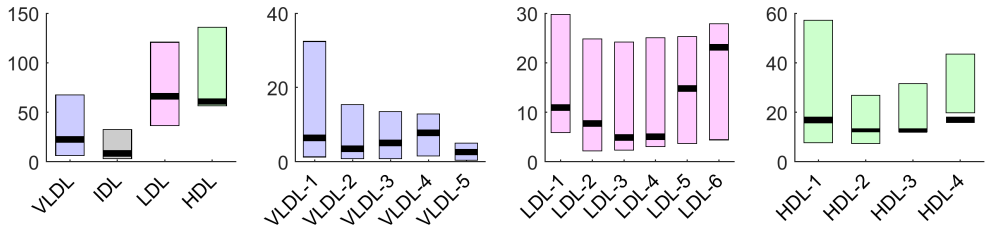
Cholesterol distribution (concentrations in mg/dL together with 95% range of model)



Free Cholesterol distribution (concentrations in mg/dL together with 95% range of model)



Phospholipids distribution (concentrations in mg/dL together with 95% range of model)



Lipoprotein Main and Subfraction Composition Tables

Lipoprotein Main Fractions

Key	Triglycerides	Value	Unit	95% Range of Model	Graphics (*)
VLTG	VLDL	99	mg/dL	21 - 336	
IDTG	IDL	10	mg/dL	5 - 100	
LDTG	LDL	33	mg/dL	12 - 45	
HDTG	HDL	8	mg/dL	7 - 29	

Key	Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
VLCH	VLDL	26	mg/dL	5 - 77	
IDCH	IDL	19	mg/dL	4 - 50	
LDCH	LDL	116	mg/dL	55 - 227	
HDCH	HDL	46	mg/dL	35 - 96	

Key	Free Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
VLFC	VLDL	11	mg/dL	3 - 33	
IDFC	IDL	5	mg/dL	1 - 14	
LDFC	LDL	35	mg/dL	17 - 63	
HDFC	HDL	9	mg/dL	7 - 27	

Key	Phospholipids	Value	Unit	95% Range of Model	Graphics (*)
VLPL	VLDL	22	mg/dL	6 - 68	
IDPL	IDL	8	mg/dL	3 - 33	
LDPL	LDL	66	mg/dL	37 - 121	
HDPL	HDL	61	mg/dL	57 - 136	

Key	Apo-A1	Value	Unit	95% Range of Model	Graphics (*)
HDA1	HDL	108	mg/dL	110 - 222	

Key	Apo-A2	Value	Unit	95% Range of Model	Graphics (*)
HDA2	HDL	28	mg/dL	25 - 48	

Key	Apo-B	Value	Unit	95% Range of Model	Graphics (*)
VLAB	VLDL	13	mg/dL	3 - 26	
IDAB	IDL	9	mg/dL	2 - 17	
LDAB	LDL	95	mg/dL	42 - 141	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

VLDL Subfractions

Key	Triglycerides	Value	Unit	95% Range of Model	Graphics (*)
V1TG	VLDL-1	45	mg/dL	6 - 212	
V2TG	VLDL-2	14	mg/dL	3 - 67	
V3TG	VLDL-3	13	mg/dL	2 - 49	
V4TG	VLDL-4	15	mg/dL	3 - 28	
V5TG	VLDL-5	5	mg/dL	1 - 7	

Key	Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
V1CH	VLDL-1	6	mg/dL	1 - 35	
V2CH	VLDL-2	3	mg/dL	0 - 15	
V3CH	VLDL-3	5	mg/dL	0 - 16	
V4CH	VLDL-4	8	mg/dL	1 - 15	
V5CH	VLDL-5	2	mg/dL	0 - 4	

Key	Free Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
V1FC	VLDL-1	2	mg/dL	0 - 13	
V2FC	VLDL-2	2	mg/dL	0 - 7	
V3FC	VLDL-3	2	mg/dL	0 - 8	
V4FC	VLDL-4	4	mg/dL	0 - 7	
V5FC	VLDL-5	0	mg/dL	0 - 2	

Key	Phospholipids	Value	Unit	95% Range of Model	Graphics (*)
V1PL	VLDL-1	6	mg/dL	1 - 32	
V2PL	VLDL-2	4	mg/dL	1 - 15	
V3PL	VLDL-3	5	mg/dL	1 - 14	
V4PL	VLDL-4	8	mg/dL	2 - 13	
V5PL	VLDL-5	3	mg/dL	0 - 5	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

LDL Subfractions

Key	Triglycerides	Value	Unit	95% Range of Model	Graphics (*)
L1TG	LDL-1	8	mg/dL	3 - 14	
L2TG	LDL-2	3	mg/dL	1 - 6	
L3TG	LDL-3	4	mg/dL	1 - 6	
L4TG	LDL-4	4	mg/dL	1 - 8	
L5TG	LDL-5	5	mg/dL	1 - 9	
L6TG	LDL-6	8	mg/dL	1 - 13	

Key	Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
L1CH	LDL-1	17	mg/dL	8 - 59	
L2CH	LDL-2	12	mg/dL	2 - 48	
L3CH	LDL-3	7	mg/dL	3 - 46	
L4CH	LDL-4	7	mg/dL	4 - 49	
L5CH	LDL-5	28	mg/dL	5 - 49	
L6CH	LDL-6	44	mg/dL	6 - 54	

Key	Free Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
L1FC	LDL-1	7	mg/dL	2 - 17	
L2FC	LDL-2	5	mg/dL	1 - 14	
L3FC	LDL-3	3	mg/dL	1 - 13	
L4FC	LDL-4	4	mg/dL	1 - 12	
L5FC	LDL-5	7	mg/dL	2 - 13	
L6FC	LDL-6	11	mg/dL	2 - 12	

Key	Phospholipids	Value	Unit	95% Range of Model	Graphics (*)
L1PL	LDL-1	11	mg/dL	6 - 30	
L2PL	LDL-2	8	mg/dL	2 - 25	
L3PL	LDL-3	5	mg/dL	2 - 24	
L4PL	LDL-4	5	mg/dL	3 - 25	
L5PL	LDL-5	15	mg/dL	4 - 25	
L6PL	LDL-6	23	mg/dL	4 - 28	

Key	Apo-B	Value	Unit	95% Range of Model	Graphics (*)
L1AB	LDL-1	13	mg/dL	5 - 31	
L2AB	LDL-2	9	mg/dL	3 - 23	
L3AB	LDL-3	7	mg/dL	3 - 27	
L4AB	LDL-4	7	mg/dL	4 - 32	
L5AB	LDL-5	22	mg/dL	5 - 34	
L6AB	LDL-6	36	mg/dL	5 - 45	

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HDL Subfractions

Key	Triglycerides	Value	Unit	95% Range of Model	Graphics (*)
H1TG	HDL-1	3	mg/dL	1 - 12	
H2TG	HDL-2	2	mg/dL	1 - 5	
H3TG	HDL-3	2	mg/dL	1 - 5	
H4TG	HDL-4	1	mg/dL	2 - 8	

Key	Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
H1CH	HDL-1	15	mg/dL	6 - 46	
H2CH	HDL-2	8	mg/dL	4 - 16	
H3CH	HDL-3	8	mg/dL	7 - 19	
H4CH	HDL-4	13	mg/dL	11 - 30	

Key	Free Cholesterol	Value	Unit	95% Range of Model	Graphics (*)
H1FC	HDL-1	3	mg/dL	1 - 12	
H2FC	HDL-2	2	mg/dL	1 - 5	
H3FC	HDL-3	1	mg/dL	1 - 5	
H4FC	HDL-4	2	mg/dL	2 - 9	

Key	Phospholipids	Value	Unit	95% Range of Model	Graphics (*)
H1PL	HDL-1	17	mg/dL	8 - 57	
H2PL	HDL-2	13	mg/dL	7 - 27	
H3PL	HDL-3	13	mg/dL	12 - 32	
H4PL	HDL-4	17	mg/dL	20 - 44	

Key	Apo-A1	Value	Unit	95% Range of Model	Graphics (*)
H1A1	HDL-1	19	mg/dL	6 - 75	
H2A1	HDL-2	13	mg/dL	10 - 36	
H3A1	HDL-3	20	mg/dL	18 - 47	
H4A1	HDL-4	50	mg/dL	56 - 110	

Key	Apo-A2	Value	Unit	95% Range of Model	Graphics (*)
H1A2	HDL-1	2	mg/dL	1 - 8	
H2A2	HDL-2	3	mg/dL	2 - 8	
H3A2	HDL-3	5	mg/dL	5 - 12	
H4A2	HDL-4	13	mg/dL	12 - 30	

(*) Gray horizontal boxes represent 95% range of model, black vertical lines represent sample value.

Explanations

Bruker **I**VDr **Li**poprotein **S**ubclass **A**nalysis B.I.LISA™ has been developed for analysis of spectra from human plasma or serum samples acquired on base of Bruker's preparation and measurement SOPs.

Bruker **I**VDr **Li**poprotein **S**ubclass **A**nalysis B.I.LISA™ uses regression models to predict the concentration of the parameters listed in this report. The regression models were established on base of training data combining NMR spectroscopy data and ultracentrifugation based data. Listed parameters are in part highly correlated.

Incompliance to Bruker's NMR preparation and measurement SOPs may result in major errors in the concentrations determined by **B**ruker **I**VDr **Li**poprotein **S**ubclass **A**nalysis B.I.LISA™.

Principal lipoprotein classes:

VLDL : Very Low Density Lipoprotein
IDL : Intermediate Density Lipoprotein
LDL : Low Density Lipoprotein
HDL : High Density Lipoprotein

Densities (in kg/L) of Lipoprotein Main Fractions:

VLDL	IDL	LDL	HDL
0.950 - 1.006	1.006 - 1.019	1.019 - 1.063	1.063 - 1.210

Density of the Very Low Density Lipoprotein Subfractions:

5 subfractions VLDL-1 ... VLDL-5, numbering according to increasing density.
Subfractions properties are specified in [1]

Densities (in kg/L) of Low Density Lipoprotein Subfractions:

LDL-1	LDL-2	LDL-3	LDL-4	LDL-5	LDL-6
1.019 - 1.031	1.031 - 1.034	1.034 - 1.037	1.037 - 1.040	1.040 - 1.044	1.044 - 1.063

Densities (in kg/L) of High Density Lipoprotein Subfractions:

HDL-1	HDL-2	HDL-3	HDL-4
1.063 - 1.100	1.100 - 1.112	1.112 - 1.125	1.125 - 1.210

Citations related to reference method (ultracentrifugation) used for development of models:

1 Lindgren FT, Jensen LL, Hatch FT (1972) The isolation and quantitative analysis of serum lipoproteins. In: Nelson GJ (ed.) Blood lipids and lipoproteins: Quantitation, composition and metabolism. Wiley-Interscience, New York, p 181-274

2 Lindgren FT (1975) Preparative ultracentrifugal laboratory procedures and suggestions for lipoprotein analysis. In: Perkins EG (ed.) Analysis of lipids and lipoproteins. American Oil Chemists' Society, Champain, Ill., p 204-24

3 Anderson DW, Nichols AV, Forte TM, Lindgren FT (1977) Particle distribution of human serum high density lipoproteins. Biochim Biophys Acta 493: 55-68

4 Baumstark MW, Kreutz W, Berg A, Frey I, Keul J (1990) Structure of human low-density lipoprotein subfractions, determined by X-ray small-angle scattering. Biochim Biophys Acta 1037: 48-57