

CoreMetabolomics

Blood biomarker list

Biomarkers

Cholesterol		Total Lipids		Fatty Acids	
Total cholesterol	mmol/L	Total lipids in lipoprotein particles	mmol/L	Total fatty acids	mmol/L
Total cholesterol minus HDL-C	mmol/L	Total lipids in VLDL	mmol/L	Degree of unsaturation	degree
Remnant cholesterol (non-HDL, non-LDL -cholesterol)	mmol/L	Total lipids in LDL	mmol/L	Omega-3 fatty acids	mmol/L
VLDL cholesterol	mmol/L	Total lipids in HDL	mmol/L	Omega-6 fatty acids	mmol/L
Clinical LDL cholesterol	mmol/L	Lipoprotein Particle Concentrations		Polyunsaturated fatty acids	mmol/L
LDL cholesterol	mmol/L	Total concentration of lipoprotein particles	mmol/L	Monounsaturated fatty acids	mmol/L
HDL cholesterol	mmol/L	Concentration of VLDL particles		Saturated fatty acids	mmol/L
Triglycerides		Concentration of LDL particles	mmol/L	Linoleic acid	mmol/L
Total triglycerides	mmol/L	Concentration of HDL particles	mmol/L	Docosahexaenoic acid	mmol/L
Triglycerides in VLDL	mmol/L	Lipoprotein Particle Sizes		Fatty Acid Ratios	
Triglycerides in LDL	mmol/L	Average diameter for VLDL particles	nm	Ratio of omega-3 fatty acids to total fatty acids	%
Triglycerides in HDL	mmol/L	Average diameter for LDL particles	nm	Ratio of omega-6 fatty acids to total fatty acids	%
Phospholipids		Average diameter for HDL particles	nm	Ratio of polyunsaturated fatty acids to total fatty acids	%
Total phospholipids in lipoprotein particles	mmol/L	Other Lipids		Ratio of monounsaturated fatty acids to total fatty acids	%
Phospholipids in VLDL	mmol/L	Phosphoglycerides	mmol/L	Ratio of saturated fatty acids to total fatty acids	%
Phospholipids in LDL	mmol/L	Ratio of triglycerides to phosphoglycerides	ratio	Ratio of linoleic acid to total fatty acids	%
Phospholipids in HDL	mmol/L	Total cholines	mmol/L	Ratio of docosahexaenoic acid to total fatty acids	%
Cholesteryl Esters		Phosphatidylcholines	mmol/L	Ratio of polyunsaturated fatty acids to monounsaturated fatty acids	ratio
Total esterified cholesterol	mmol/L	Sphingomyelins	mmol/L	Ratio of omega-6 fatty acids to omega-3 fatty acids	ratio
Cholesteryl esters in VLDL	mmol/L	Apolipoproteins		Amino Acids	
Cholesteryl esters in LDL	mmol/L	Apolipoprotein B	g/L	Alanine	mmol/L
Cholesteryl esters in HDL	mmol/L	Apolipoprotein A1	g/L	Glutamine	mmol/L
Free Cholesterol		Ratio of apolipoprotein B to apolipoprotein A1	ratio	Glycine	mmol/L
Total free cholesterol	mmol/L			Histidine	mmol/L
Free cholesterol in VLDL	mmol/L				
Free cholesterol in LDL	mmol/L				
Free cholesterol in HDL	mmol/L				

Branched-chain Amino Acids		Very Large VLDL (Average Diameter 64 nm)		IDL (Average Diameter 28.6 nm)	
Total concentration of branched-chain amino acids (leucine + isoleucine + valine)	mmol/L	Concentration of very large VLDL particles	mmol/L	Concentration of IDL particles	mmol/L
Isoleucine	mmol/L	Total lipids in very large VLDL	mmol/L	Total lipids in IDL	mmol/L
Leucine	mmol/L	Phospholipids in very large VLDL	mmol/L	Phospholipids in IDL	mmol/L
Valine	mmol/L	Cholesterol in very large VLDL	mmol/L	Cholesterol in IDL	mmol/L
		Cholesteryl esters in very large VLDL	mmol/L	Cholesteryl esters in IDL	mmol/L
		Triglycerides in very large VLDL	mmol/L	Free cholesterol in IDL	mmol/L
				Triglycerides in IDL	mmol/L
Aromatic Amino Acids		Large VLDL (Average Diameter 53.6 nm)		Large LDL (Average Diameter 25.5 nm)	
Phenylalanine	mmol/L	Concentration of large VLDL particles	mmol/L	Concentration of large LDL particles	mmol/L
Tyrosine	mmol/L	Total lipids in large VLDL	mmol/L	Total lipids in large LDL	mmol/L
		Phospholipids in large VLDL	mmol/L	Phospholipids in large LDL	mmol/L
		Cholesterol in large VLDL	mmol/L	Cholesterol in large LDL	mmol/L
		Cholesteryl esters in large VLDL	mmol/L	Cholesteryl esters in large LDL	mmol/L
		Free cholesterol in large VLDL	mmol/L	Free cholesterol in large LDL	mmol/L
		Triglycerides in large VLDL	mmol/L	Triglycerides in large LDL	mmol/L
Glycolysis Related Metabolites		Medium VLDL (Average Diameter 44.5 nm)		Medium LDL (Average Diameter 23 nm)	
Glucose	mmol/L	Concentration of medium VLDL particles	mmol/L	Concentration of medium LDL particles	mmol/L
Lactate	mmol/L	Total lipids in medium VLDL	mmol/L	Total lipids in medium LDL	mmol/L
Pyruvate	mmol/L	Phospholipids in medium VLDL	mmol/L	Phospholipids in medium LDL	mmol/L
Citrate **	mmol/L	Cholesterol in medium VLDL	mmol/L	Cholesterol in medium LDL	mmol/L
Glycerol *	mmol/L	Cholesteryl esters in medium VLDL	mmol/L	Cholesteryl esters in medium LDL	mmol/L
		Free cholesterol in medium VLDL	mmol/L	Free cholesterol in medium LDL	mmol/L
		Triglycerides in medium VLDL	mmol/L	Triglycerides in medium LDL	mmol/L
Ketone Bodies		Small VLDL (Average Diameter 36.8 nm)		Small LDL (Average Diameter 18.7 nm)	
3-Hydroxybutyrate	mmol/L	Concentration of small VLDL particles	mmol/L	Concentration of small LDL particles	mmol/L
Acetate	mmol/L	Total lipids in small VLDL	mmol/L	Total lipids in small LDL	mmol/L
Acetoacetate	mmol/L	Phospholipids in small VLDL	mmol/L	Phospholipids in small LDL	mmol/L
Acetone	mmol/L	Cholesterol in small VLDL	mmol/L	Cholesterol in small LDL	mmol/L
		Cholesteryl esters in small VLDL	mmol/L	Cholesteryl esters in small LDL	mmol/L
		Free cholesterol in small VLDL	mmol/L	Free cholesterol in small LDL	mmol/L
		Triglycerides in small VLDL	mmol/L	Triglycerides in small LDL	mmol/L
Fluid Balance		Very Small VLDL (Average Diameter 31.3 nm)		Very Large HDL (Average Diameter 14.3 nm)	
Creatinine	mmol/L	Concentration of very small VLDL particles	mmol/L	Concentration of very large HDL particles	mmol/L
Albumin	g/L	Total lipids in very small VLDL	mmol/L	Total lipids in very large HDL	mmol/L
		Phospholipids in very small VLDL	mmol/L	Phospholipids in very large HDL	mmol/L
		Cholesterol in very small VLDL	mmol/L	Cholesterol in very large HDL	mmol/L
		Cholesteryl esters in very small VLDL	mmol/L	Cholesteryl esters in very large HDL	mmol/L
		Free cholesterol in very small VLDL	mmol/L	Free cholesterol in very large HDL	mmol/L
		Triglycerides in very small VLDL	mmol/L	Triglycerides in very large HDL	mmol/L
Inflammation					
Glycoprotein acetyls	mmol/L				
Lipoprotein Subclasses					
Chylomicrons and extremely large VLDL (particle diameters from 75 nm upwards)					
Concentration of chylomicrons and extremely large VLDL particles	mmol/L				
Total lipids in chylomicrons and extremely large VLDL	mmol/L				
Phospholipids in chylomicrons and extremely large VLDL	mmol/L				
Cholesterol in chylomicrons and extremely large VLDL	mmol/L				
Cholesteryl esters in chylomicrons and extremely large VLDL	mmol/L				
Free cholesterol in chylomicrons and extremely large VLDL	mmol/L				
Triglycerides in chylomicrons and extremely large VLDL	mmol/L				

Large HDL (Average Diameter 12.1 nm)					
Concentration of large HDL particles	mmol/L				
Total lipids in large HDL	mmol/L				
Phospholipids in large HDL	mmol/L				
Cholesterol in large HDL	mmol/L				
Cholesteryl esters in large HDL	mmol/L				
Free cholesterol in large HDL	mmol/L				
Triglycerides in large HDL	mmol/L				
Medium HDL (average diameter 10.9 nm)					
Concentration of medium HDL particles	mmol/L				
Total lipids in medium HDL	mmol/L				
Phospholipids in medium HDL	mmol/L				
Cholesterol in medium HDL	mmol/L				
Cholesteryl esters in medium HDL	mmol/L				
Free cholesterol in medium HDL	mmol/L				
Triglycerides in medium HDL	mmol/L				
Small HDL (average diameter 8.7 nm)					
Concentration of small HDL particles	mmol/L				
Total lipids in small HDL	mmol/L				
Phospholipids in small HDL	mmol/L				
Cholesterol in small HDL	mmol/L				
Cholesteryl esters in small HDL	mmol/L				
Free cholesterol in small HDL	mmol/L				
Triglycerides in small HDL	mmol/L				
Relative Lipoprotein Lipid Concentrations					
Chylomicrons and extremely large VLDL ratios					
Phospholipids to total lipids ratio in chylomicrons and extremely large VLDL	%				
Cholesterol to total lipids ratio in chylomicrons and extremely large VLDL	%				
Cholesteryl esters to total lipids ratio in chylomicrons and extremely large VLDL	%				
Free cholesterol to total lipids ratio in chylomicrons and extremely large VLDL	%				
Triglycerides to total lipids ratio in chylomicrons and extremely large VLDL	%				
Very large VLDL ratios					
Phospholipids to total lipids ratio in very large VLDL	%				
Cholesterol to total lipids ratio in very large VLDL	%				
Large HDL ratios					
Cholesteryl esters to total lipids ratio in very large VLDL	%				
Free cholesterol to total lipids ratio in very large VLDL	%				
Triglycerides to total lipids ratio in very large VLDL	%				
Large VLDL ratios					
Phospholipids to total lipids ratio in large VLDL	%				
Cholesterol to total lipids ratio in large VLDL	%				
Cholesteryl esters to total lipids ratio in large VLDL	%				
Free cholesterol to total lipids ratio in large VLDL	%				
Triglycerides to total lipids ratio in large VLDL	%				
Medium VLDL ratios					
Phospholipids to total lipids ratio in medium VLDL	%				
Cholesterol to total lipids ratio in medium VLDL	%				
Cholesteryl esters to total lipids ratio in medium VLDL	%				
Free cholesterol to total lipids ratio in medium VLDL	%				
Triglycerides to total lipids ratio in medium VLDL	%				
Small VLDL ratios					
Phospholipids to total lipids ratio in small VLDL	%				
Cholesterol to total lipids ratio in small VLDL	%				
Cholesteryl esters to total lipids ratio in small VLDL	%				
Free cholesterol to total lipids ratio in small VLDL	%				
Triglycerides to total lipids ratio in small VLDL	%				
Very small VLDL ratios					
Phospholipids to total lipids ratio in very small VLDL	%				
Cholesterol to total lipids ratio in very small VLDL	%				
Cholesteryl esters to total lipids ratio in very small VLDL	%				
Free cholesterol to total lipids ratio in very small VLDL	%				
Triglycerides to total lipids ratio in very small VLDL	%				
IDL ratios					
Phospholipids to total lipids ratio in IDL	%				
Cholesterol to total lipids ratio in IDL	%				
Cholesteryl esters to total lipids ratio in IDL	%				
Free cholesterol to total lipids ratio in IDL	%				
Triglycerides to total lipids ratio in IDL	%				
Large LDL ratios					
Phospholipids to total lipids ratio in large LDL	%				
Cholesterol to total lipids ratio in large LDL	%				
Cholesteryl esters to total lipids ratio in large LDL	%				
Free cholesterol to total lipids ratio in large LDL	%				
Triglycerides to total lipids ratio in large LDL	%				
Medium LDL ratios					
Phospholipids to total lipids ratio in medium LDL	%				
Cholesterol to total lipids ratio in medium LDL	%				
Cholesteryl esters to total lipids ratio in medium LDL	%				
Free cholesterol to total lipids ratio in medium LDL	%				
Triglycerides to total lipids ratio in medium LDL	%				
Small LDL ratios					
Phospholipids to total lipids ratio in small LDL	%				
Cholesterol to total lipids ratio in small LDL	%				
Cholesteryl esters to total lipids ratio in small LDL	%				
Free cholesterol to total lipids ratio in small LDL	%				
Triglycerides to total lipids ratio in small LDL	%				
Very large HDL ratios					
Phospholipids to total lipids ratio in very large HDL	%				
Cholesterol to total lipids ratio in very large HDL	%				
Cholesteryl esters to total lipids ratio in very large HDL	%				
Free cholesterol to total lipids ratio in very large HDL	%				
Triglycerides to total lipids ratio in very large HDL	%				

Large HDL ratios

Phospholipids to total lipids ratio in large HDL	%
Cholesterol to total lipids ratio in large HDL	%
Cholesteryl esters to total lipids ratio in large HDL	%
Free cholesterol to total lipids ratio in large HDL	%
Triglycerides to total lipids ratio in large HDL	%

Medium HDL ratios

Phospholipids to total lipids ratio in medium HDL	%
Cholesterol to total lipids ratio in medium HDL	%
Cholesteryl esters to total lipids ratio in medium HDL	%
Free cholesterol to total lipids ratio in medium HDL	%
Triglycerides to total lipids ratio in medium HDL	%

Small HDL ratios

Phospholipids to total lipids ratio in small HDL	%
Cholesterol to total lipids ratio in small HDL	%
Cholesteryl esters to total lipids ratio in small HDL	%
Free cholesterol to total lipids ratio in small HDL	%
Triglycerides to total lipids ratio in small HDL	%

All listed biomarkers are available for Serum and Heparin plasma samples. For Research Use Only. Not for use in diagnostic procedures.

Biomarkers marked with * are not available for EDTA plasma samples. Biomarkers marked with ** are not available for Citrate plasma samples.