

# Nightingale Cord Blood Biomarker Analysis Service

Explore the underlying mechanisms of pregnancy and early life course health.

Nightingale

## Powerful platform enabled by NMR

### Unique combination of biomarkers

Biomarkers include clinically validated routine markers, emerging biomarkers with strong medical relevance and promising, new biomarkers.

### Robust and highly reproducible results

Our fully automated analysis process is constantly monitored under a certified quality management system. And the NMR technology allows high reproducibility which ensures consistent and reliable results across all sample sets.

### Fast, cost-efficient and scalable technology

We use a high-throughput NMR technology which ensures efficient analysis for sample sets of all sizes without batch effects.

### Accurate and fully quantified metabolic data

Not only our analysis, but even our quantification process of the NMR spectral data is fully automated, which provides precise and accurate metabolite results in absolute concentration units.

### Comprehensive overview of an individual's health

Biomarkers in our panel provide a physiologically meaningful picture of the overall health making it possible to explore novel connections between metabolites and an individual's health status.

### Certified quality management system

Nightingale's quality management system has been certified according to EN ISO 13485 standard.

### APPLICATION EXAMPLES

Early risk detection and prognostics of type 1 and type 2 diabetes as well as diabetic complications, especially for diabetic kidney disease

Molecular understanding of cardiometabolic risk factors such as adiposity and body fat distribution, and what role they play in the disease etiology

Genetic regulation of urine metabolism and further implications to disease etiology

Exploring metabolic effects of an individual's diet and lifestyle on health

### TECH SPECIFICATIONS

<b>Technology</b>	<sup>1</sup> H NMR Spectroscopy, Nightingale Health's proprietary analysis
<b>Specimen type</b>	Human umbilical cord serum and plasma
<b>Sample volume</b>	100 µL
<b>Number of biomarkers</b>	110
<b>Result units</b>	Absolute biomarker quantification (mmol/l or g/l)
<b>Sample storage</b>	Long-term storage -70° C or below

# List of all biomarkers

<b>Cholesterol</b>		Phosphatidylcholines	mmol/l	<b>Ketone bodies</b>		<b>Small LDL (average size 18.7 nm)</b>	
Total cholesterol	mmol/l	Sphingomyelins	mmol/l	3-Hydroxybutyrate	mmol/l	Concentration of small LDL particles	mmol/l
Total cholesterol minus HDL-C	mmol/l			Acetate	mmol/l	Total lipids in small LDL	mmol/l
Remnant cholesterol (non-HDL, non-LDL -cholesterol)	mmol/l	<b>Apolipoproteins</b>		Acetoacetate	mmol/l		
VLDL cholesterol	mmol/l	Apolipoprotein B	g/l	Acetone	mmol/l	<b>Very large HDL (average size 14.3 nm)</b>	
Clinical LDL cholesterol	mmol/l	Apolipoprotein A1	g/l			Concentration of very large HDL particles	mmol/l
LDL cholesterol	mmol/l	Ratio of apolipoprotein B to apolipoprotein A1	ratio	<b>Fluid balance</b>		Total lipids in very large HDL	mmol/l
HDL cholesterol	mmol/l			Creatinine	mmol/l		
		<b>Fatty acids</b>		Albumin	signal area	<b>Large HDL (average size 12.1 nm)</b>	
<b>Triglycerides</b>		Total fatty acids	mmol/l			Concentration of large HDL particles	mmol/l
Total triglycerides	mmol/l	Degree of unsaturation	degree	<b>Inflammation</b>		Total lipids in very large HDL	mmol/l
Triglycerides in VLDL	mmol/l	Omega-3 fatty acids	mmol/l	Glycoprotein acetyls (GlycA)	mmol/l		
Triglycerides in LDL	mmol/l	Omega-6 fatty acids	mmol/l			<b>Medium HDL (average size 10.9 nm)</b>	
Triglycerides in HDL	mmol/l	Polyunsaturated fatty acids	mmol/l	<b>Lipoprotein subclasses</b>		Concentration of medium HDL particles	mmol/l
		Monounsaturated fatty acids	mmol/l	<b>Chylomicrons and extremely large VLDL (particle diameters from 75 nm upwards)</b>		Total lipids in medium HDL	mmol/l
<b>Phospholipids</b>		Saturated fatty acids	mmol/l	Concentration of chylomicrons and extremely large VLDL particles	mmol/l		
Total phospholipids in lipoprotein particles	mmol/l	Linoleic acid	mmol/l	Total lipids in chylomicrons and extremely large VLDL	mmol/l	<b>Small HDL (average size of 8.7 nm)</b>	
Phospholipids in VLDL	mmol/l	Docosahexaenoic acid	mmol/l			Concentration of small HDL particle	mmol/l
Phospholipids in LDL	mmol/l			<b>Very large VLDL (average size 64 nm)</b>		Total lipids in small HDL	mmol/l
Phospholipids in HDL	mmol/l	<b>Fatty acid ratios</b>		Concentration of very large VLDL particles	mmol/l		
		Ratio of omega-3 fatty acids to total fatty acids	%	Total lipids in very large VLDL	mmol/l		
<b>Cholesteryl esters</b>		Ratio of omega-6 fatty acids to total fatty acids	%			<b>Large VLDL (average size 53.6 nm)</b>	
Total esterified cholesterol	mmol/l	Ratio of polyunsaturated fatty acids to total fatty acids	%	Concentration of large VLDL particles	mmol/l	Total lipids in large VLDL	mmol/l
Cholesteryl esters in VLDL	mmol/l	Ratio of monounsaturated fatty acids to total fatty acids	%				
Cholesteryl esters in LDL	mmol/l	Ratio of saturated fatty acids to total fatty acids	%	<b>Medium VLDL (average size 44.5 nm)</b>			
Cholesteryl esters in HDL	mmol/l	Ratio of linoleic acid to total fatty acids	%	Concentration of medium VLDL particles	mmol/l		
		Ratio of docosahexaenoic acid to total fatty acids	%	Total lipids in medium VLDL	mmol/l		
<b>Free cholesterol</b>		Ratio of polyunsaturated fatty acids to monounsaturated fatty acids	ratio			<b>Small VLDL (average size 36.8 nm)</b>	
Total free cholesterol	mmol/l	Ratio of omega-6 fatty acids to omega-3 fatty acids	ratio	Concentration of small VLDL particles	mmol/l	Total lipids in small VLDL	mmol/l
Free cholesterol in VLDL	mmol/l						
Free cholesterol in LDL	mmol/l	<b>Amino acids</b>		<b>Very small VLDL (average size 31.3 nm)</b>			
Free cholesterol in HDL	mmol/l	Alanine	mmol/l	Concentration of very small VLDL particles	mmol/l		
		Glutamine	mmol/l	Total lipids in very small VLDL	mmol/l		
<b>Total lipids</b>		Glycine	mmol/l			<b>IDL (average size 28.6 nm)</b>	
Total lipids in lipoprotein particles	mmol/l	Histidine	mmol/l	Concentration of IDL particles	mmol/l	Total lipids in IDL	mmol/l
Total lipids in VLDL	mmol/l						
Total lipids in LDL	mmol/l	<b>Branched-chain amino acids</b>		<b>Large LDL (average size 25.5 nm)</b>			
Total lipids in HDL	mmol/l	Total concentration of branched-chain amino acids (leucine + isoleucine + valine)	mmol/l	Concentration of large LDL particles	mmol/l		
		Isoleucine	mmol/l	Total lipids in large LDL	mmol/l		
<b>Lipoprotein particle concentrations</b>		Leucine	mmol/l			<b>Medium LDL (average size 23 nm)</b>	
Total concentration of lipoprotein particles	mmol/l	Valine	mmol/l	Concentration of medium LDL particles	mmol/l	Total lipids in medium LDL	mmol/l
Concentration of VLDL particles	mmol/l						
Concentration of LDL particles	mmol/l	<b>Aromatic amino acids</b>					
Concentration of HDL particles	mmol/l	Phenylalanine	mmol/l				
		Tyrosine	mmol/l				
<b>Lipoprotein particle sizes</b>							
Average diameter for VLDL particles	nm	<b>Glycolysis related metabolites</b>					
Average diameter for LDL particles	nm	Glucose	mmol/l				
Average diameter for HDL particles	nm	Lactate	mmol/l				
		Pyruvate	mmol/l				
<b>Other lipids</b>		Citrate **	mmol/l				
Phosphoglycerides	mmol/l	Glycerol *	mmol/l				
Ratio of triglycerides to phosphoglycerides	ratio						
Total cholines	mmol/l						

All listed biomarkers are available for Serum and Heparin plasma samples.

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

## SEE ALSO

Nightingale Blood Analysis Service  
Nightingale CSF Biomarker Analysis Service  
Nightingale Urine Biomarker Analysis Service

# Nightingale