



**Genetic Testing for Dyslipidemias**

Dyslipidemias are a clinically and genetically heterogeneous group of disorders associated with abnormal levels of lipids and lipoproteins, including increased or decreased levels of LDL or HDL cholesterol or increased levels of triglycerides [1]. Dyslipidemias can have a monogenic cause, or may be associated with other conditions such as diabetes and thyroid disease, or lifestyle factors. The most common subset of monogenic dyslipidemia is familial hypercholesterolemia (FH), which has an estimated prevalence of 1 in 200 in the Caucasian population [2].

*Our Dyslipidemia Sequencing and Deletion/Duplication Panels include analysis of all 23 genes listed below.*

Dyslipidemia Panel Genes					
ABCA1	APOA1	CETP	LDLR	LMF1	SAR1B
ABCG5	APOA5	GPD1	LDLRAP1	LPL	SCARB1
ABCG8	APOB	GPIHBP1	LIPA	MTTP	STAP1
ANGPTL3	APOC2	LCAT	LIPC	PCSK9	

Gene	OMIM#	Associated disorders	Dyslipidemia phenotype	Inheritance	References
ABCA1	600046	Tangier disease; High density lipoprotein (HDL) deficiency	Low HDL-C	Recessive; Dominant	[3, 4]
ABCG5	605459	Sitosterolemia	Hypercholesterolemia, hypersitosterolemia	Recessive	[5]
ABCG8	605460	Sitosterolemia	Hypercholesterolemia, hypersitosterolemia	Recessive	[5]
ANGPTL3	605019	Familial hypobetalipoproteinemia-2	Low LDL-C	Recessive	[6]
APOA1	107680	Apolipoprotein A-I deficiency; HDL deficiency	Low HDL-C	Recessive; Dominant	[7, 8]
APOA5	606368	Hyperchylomicronemia; Hypertriglyceridemia	Hypertriglyceridemia	Dominant/Recessive; Dominant	[9, 10]
APOB	107730	Familial hypercholesterolemia; hypobetalipoproteinemia	High LDL-C; Low LDL-C	Co-dominant	[1, 11]
APOC2	608083	Apolipoprotein C-II deficiency	Hypertriglyceridemia	Recessive	[12]
CETP	118470	Hyperalphalipoproteinemia	High HDL-C	Dominant/Recessive	[13, 14]
GPD1	138420	Transient infantile hypertriglyceridemia	Hypertriglyceridemia	Recessive	[15]
GPIHBP1	612757	Hyperlipoproteinemia 1D	Hypertriglyceridemia	Recessive	[16]
LCAT	606967	Familial LCAT deficiency	Low HDL-C	Recessive	[17]
LDLR	606945	Familial hypercholesterolemia	High LDL-C	Co-dominant	[1]
LDLRAP1	605747	Familial hypercholesterolemia	High LDL-C	Recessive	[1]
LIPA	613497	Cholesterol ester storage disease / Wolman disease	High LDL-C	Recessive	[18, 19]
LIPC	151670	Hepatic lipase deficiency	High HDL-C	Dominant/Recessive	[20, 21]
LMF1	611761	Combined lipase deficiency	Hypertriglyceridemia	Recessive	[22, 23]

LPL	609708	Lipoprotein lipase deficiency; Familial combined hyperlipidemia	Hypertriglyceridemia	Recessive; Dominant	[24, 25]
MTP	157147	Abetalipoproteinemia	Low LDL-C	Recessive	[26]
PCSK9	607786	Familial hypercholesterolemia; Hypobetalipoproteinemia	High LDL-C; Low LDL-C	Dominant	[1]
SAR1B	607690	Chylomicron retention disease	Low LDL-C	Recessive	[27]
SCARB1	601040	Scavenger receptor B1 deficiency	High HDL-C	Dominant/Recessive	[28, 29]
STAP1	604298	Familial hypercholesterolemia	High LDL-C	Dominant	[30]

### Test methods:

Comprehensive sequence coverage of the coding regions and splice junctions of all genes in this panel is performed. Targets of interests are enriched and prepared for sequencing using the Agilent SureSelect system. Sequencing is performed using Illumina technology and reads are aligned to the reference sequence. Variants are identified and evaluated using a custom collection of bioinformatic tools and comprehensively interpreted by our team of directors and genetic counselors. All pathogenic and likely pathogenic variants are confirmed by Sanger sequencing. The technical sensitivity of this test is estimated to be >99% for single nucleotide changes and insertions and deletions of less than 20 bp.

Deletion/duplication analysis of the panel genes is performed by oligonucleotide array-CGH. Partial exonic copy number changes and rearrangements of less than 400 bp may not be detected by array-CGH. Array-CGH will not detect low-level mosaicism, balanced translocations, inversions, or point mutations that may be responsible for the clinical phenotype. The sensitivity of this assay may be reduced when DNA is extracted by an outside laboratory.

### Dyslipidemia Sequencing Panel (23 genes sequence analysis)

Sample specifications:	3 to 10 cc of blood in a purple top (EDTA) tube
Cost:	\$3000
CPT codes:	81407
Turn-around time:	8 weeks

### Dyslipidemia Deletion/Duplication Panel (23 genes deletion/duplication analysis)

Sample specifications:	3 to 10 cc of blood in a purple top (EDTA) tube
Cost:	\$2500
CPT codes:	81407
Turn-around time:	6 weeks

### Results:

Results, along with an interpretive report, will be faxed to the referring physician. Additional reports will be provided as requested. All abnormal results will be reported by telephone.

***For more information about our testing options, please visit our website at [dnatesting.uchicago.edu](http://dnatesting.uchicago.edu) or contact us at 773-834-0555.***

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