MEDPACE

DYSLIPIDEMIA PANEL SERVICES

TEST OVERVIEW

Dyslipidemia is a lipoprotein disorder characterized by an imbalance of serum lipids such as cholesterol, low-density lipoprotein cholesterol (LDL-C), triglycerides, and high-density lipoprotein (HDL).[1] Dyslipidemia is recognized as a prominent risk factor for cardiovascular disease and a key driver for other complications such as coronary atherosclerosis.[1]

Many dyslipidemias have an underlying hereditary component, with the genetic cause being either monogenic (caused by rare DNA variants with a strong impact on phenotype) or polygenic (caused in part by many common genetic variants each with a small impact on phenotype).[2] While genetic testing for monogenic dyslipidemias often has tangible clinical utility, further research is needed to clarify potential clinical usefulness of polygenic scoring.[2]

Next generation sequencing (NGS) is a powerful tool that has revolutionized genetic testing. This groundbreaking technology allows the rapid and accurate sequencing of the human genome, improving the understanding of disease and paving the way for personalized healthcare. The Medpace Dyslipidemia panel uses NGS to detect germline variants in genes linked to established monogenic dyslipidemias and related metabolic diseases.[3] The panel also covers several single nucleotide polymorphisms reported to contribute to polygenic risk for elevated triglycerides & LDL-C levels.

TEST DETAILS

The Medpace Dyslipidemia NGS panel uses a custom KAPA HyperExplore probe set design covering 73 genes (listed on Table 1) and 177 SNVs associated with clinical dyslipidemias and related metabolic disorders.[3] The sequencing is performed on the Ilumina MiSeq or Illumina NextSeq 2000. The sequence alignment and variant calling are performed using a validated automated workflow designed in CLC Bio Genomics Workbench 22.0.2 and VarSeq 2.4.

Gene Name								
ABCA 1	*ANGPTL3*	*BLK*	*CPT2*	*GPIHBP1*	*LDLR*	*LMNB2*	*PAX4*	*PTRF*
ABCC8	*APOA1*	*BSCL2*	*CREB3L3*	*HNF1A*	*LDLRAP1*	*LPIN1*	*PCSK9*	*PYGM*
ABCG1	*APOA4*	*CAV1*	*CYP2D6*	*HNF1B*	*LIPA*	*LPL*	*PDX1*	*SAR1B*
ABCG5	*APOA5*	*CAV2*	*EMD*	*HNF4A*	*LIPC*	*MLXIPL*	*PLIN1*	*SCARB1*
ABCG8	*APOB*	*CEL*	*GALNT2*	*INS*	*LIPE*	*MTTP*	*PLTP*	*SLC22A8*
AGPAT2	*APOC2*	*CETP*	*GCK*	*KCNJ11*	*LIPG*	*MYLIP*	*PNPLA2*	*SORT1*
AKT2	*APOC3*	*CIDEC*	*GCKR*	*KLF11*	*LMF1*	*NEUROD1*	*PPARA*	*TRIB1*
AMPD1	*APOE*	*COQ2*	*GPD1*	*LCAT*	*LMNA*	*NPC1L1*	*PPARG*	*WRN*
								ZMPSTE24

Table 1: List of genes covered by Medpace Dyslipidemia NGS panel.

SPECIMEN TYPES

Medpace performs this test on DNA extracted from whole blood, collected in K2EDTA tube. This assay requires a total of 100ng of genomic DNA as input.

SENSITIVITY, SPECIFICITY AND LIMIT OF DETECTION (LOD)

Medpace Dyslipidemia NGS panel has an overall sensitivity of > 95% for single nucleotide variants, with a specificity > 99%.

REPORTABLE OUTCOME

Each exon of every coding isoform of the 73 targeted genes is captured including 150bp into the introns and an extra 2 kb of upstream sequence, and 500 bp of downstream sequence. The SNVs of interest are captured using probes covering the region of interest. These regions are based on the human Genome Reference Consortium GRCh37 genome build.

REFERENCE RANGE

Each gene targeted in this assay has an associated wildtype reference sequence. The references used in this assay are based on the Genome Reference Consortium GRCh37 build, and the gene reference sequences are from Ensembl (https://www.ensembl.org/Homo_sapiens/Info/Index).

NGS AT MEDPACE

Medpace uses several Illumina-based NGS instruments including the MiSeq, MiSeqDx, NextSeq 550 and NextSeq 2000 at both our US and Belgium laboratories. Medpace is capable of performing several NGS techniques including whole exome sequencing (WES), RNA-sequencing (RNA-seq) and targeted gene sequencing. Our validated Targeted sequencing panels include the Dyslipidemia panel, a Cancer panel, Familial Hypercholesterolemia (FH) panel, and a Myeloid Malignancies panel. Targeted panels have the advantage of providing increased depth of coverage while generating sequencing information in a cost-effective manner.

REFERENCES

1. Hedayatnia M., et al. Dyslipidemia and cardiovascular disease risk among the MASHAD study population. Lipids in Health and Disease. 2020 Mar 16;19(1):42.
2. Brown E.E., et al. Genetic testing in dyslipidemia: A scientific statement from the National Lipid Association. Journal of Clinical Lipidology. 2020 May 06;14(4):398-413.
3. Johansen C.T., et al. LipidSeq: a next-generation clinical resequencing panel for monogenic dyslipidemias. Journal of Lipid Research. 2014 Apr;55(4):765-72.