NGS Disease Research Panels

ClearSeq Cancer Panels

Next Generation Cancer Profiling

Often difficult to clearly detect, alterations in key genes such as EGFR, KRAS, BRAF, NPM1 and ALK are driving the adoption of next generation sequencing.

ClearSeq cancer research panels are oligonucleotide-based target enrichment reagents for the detection of DNA variants using next generation sequencing (NGS). These NGS panels, developed in collaboration with leading cancer experts, enable clinical researchers to confidently identify mutations from FFPE, blood and bone marrow samples. These multigene panels are more time and cost-effective than running multiple traditional single-gene analyses. The ClearSeq panels are designed for use with Agilent SureSelect or Haloplex Target Enrichment System reagents and are compatible with Illumina and Ion Torrent DNA sequencing platforms.

Confident Answers

Even when starting with limited amounts of input DNA (down to 50 ng) or with FFPE samples, the panels provide high sensitivity and specificity. Additionally, low frequency variants present at <1% of genomic DNA can be accurately detected using the HaloPlex^{HS} system.

Comprehensive Solution

For use with the ClearSeq Cancer panels, Agilent also has available the NGS FFPE QC Kit for assessing the quality of genomic DNA prior to NGS target enrichment. Following sequencing, variants can be identified in just a few minutes using Agilent SureCall software, which is available at no additional cost to Agilent customers. The ClearSeq Cancer solutions provide the confidence and answers needed to drive clinical research decisions.

The following panels are available and each is easily customizable with user-specified genomic regions using SureDesign software, Agilent's web-based design tool.

ClearSeq Comprehensive Cancer Panel

The ClearSeq Comprehensive Cancer panel, developed in collaboration with researchers at the Washington University in St. Louis, targets 151 disease-associated genes implicated in a wide range of cancers (i.e., breast, lung, colorectal, AML). All coding exons, exon-intron boundaries and selected introns of these genes are targeted (Table I). This panel is compatible with the SureSelect Target Enrichment System.

Table I. Comprehensive Cancer Panel Gene List

ABL1	BRCA1	EGFR	JAK2	MYC	PIK3CA	RUNX1
AKT1	BRCA2	ESR1	KRAS	MYD88	PTCH1	SMO
ALK	CDKN2A	FGFR2	KIT	NF1	PTEN	STK11
APC	CEBPA	FLT3	MAP2K2	NOTCH1	PTPN11	TET2
ASXL1	CTNNB1	HRAS	MET	NPM1	NRAS	TP53
ATM	DNMT3A	IDH1	MLL	MTOR	RB1	VHL
BRAF	ERBB2	IDH2	MPL	PDGFRA	RET	WT1
ABCB1	CYP19A1	FBXW7	IL2RB	MLH1	ROS1	SMARCB1
ABCC2	CYP2A6	FGFR1	IL2RG	MST1R	RPS6KB1	SNCAIP
ABL2	CYP2B6	FGFR3	INPP4B	NELL2	RXRA	SOS1
AKT2	CYP2C19	FGFR4	JAK1	PDGFRB	RXRB	SPRED1
AKT3	CYP2C9	FLT1	JAK3	PHF6	RXRG	SRC
ATRX	CYP2D6	FLT4	KDM6A	PIK3R1	SHH	SUFU
CBL	DDR1	FSTL5	KDR	PSMB1	SHOC2	TAS2R38
CDA	DDR2	GNA11	LAMA2	PSMB2	SLC22A1	TRRAP
CDH1	DDX3X	GNAQ	LCK	PSMB5	SLC22A2	TYK2
CDKN2B	DPYD	GNAS	LTK	PSMD1	SLC31A1	UGT1A1
CHD7	ERBB3	GSTP1	MAP2K1	PSMD2	SLC34A2	YES1
CHIC2	ERBB4	H3F3A	MAP2K4	RAF1	SLC45A3	ZMYM3
CREBBP	ERG	HNF1A	MAP3K1	RARA	SLCO1B1	
CRLF2	ESR2	IKZF1	MAPK1	RARB	SMAD4	
CSF1R	EZH2	IL2RA	MED13	RARG	SMARCA4	

ClearSeq AML^{HS} Panel

The ClearSeq AML^{HS} panel (Table II), designed in collaboration with Dr. Robert Ohgami and Dr. Daniel Arber at Stanford University, targets 48 selected exons in 20 genes found to be commonly mutated in AML. Research has also shown these genes to be associated with myelodysplastic syndromes, myelodysplastic/myeloproliferative neoplasms and myeloproliferative neoplasms. The panel provides 99.9% design coverage of targeted exons and is compatible with the HaloPlex^{HS} Target Enrichment System.

ClearSeq Cancer^{HS} Panel

The ClearSeq Cancer^{HS} panel (Table III) is designed to detect genetic mutations in known cancer hotspots. This panel targets a set of 47 genes found to be associated with a broad range of cancer types and published drug targets. The COSMIC database was the primary reference in the design process. This panel is compatible with the HaloPlex^{HS} Target Enrichment System.

Ordering Information

ClearSeq Comprehensive Cancer Panel, based upon SureSelect Target Enrichment

Part Number	Description	Rxn Size
Choose the kit(s) based on your research question and workflow:		
5190-8011	ClearSeq Comprehensive Cancer XT	16
5190-8017	ClearSeq Comprehensive Cancer XT2	16
...then choose a kit below depending upon your sequencing platform		
G9611A	Sure Select XT - ILMN	16
G9621A	SureSelect XT2 - ILMN	16
G9681A	SureSelect QXT - ILMN	16

*Available in 96, 480 and automation formats

ClearSeq Cancer, based upon HaloPlex^{HS} Target Enrichment

Part Number	Description	Rxn Size
Choose the kit(s) based on your research question and workflow:		
G9933A	ClearSeq Cancer HS, Illumina sequencer	16
G9934A	ClearSeq Cancer HS, Ion Torrent sequencer	16

ClearSeq AML, based upon HaloPlex^{HS} Target Enrichment

Part Number	Description	Rxn Size
Choose the kit(s) based on your research question and workflow:		
G9963A	ClearSeq AML HS, Illumina sequencer	16
G9964A	ClearSeq AML HS, Ion Torrent sequencer	16

*Available in 96, 480 and automation formats

Table II. ClearSeq AML^{HS} Gene List (Targeted Exons)

ASXL1	12	**MPL**	10
CSF3R	14, 17	**NPM1**	11
CBL	8, 9	**NRAS**	2, 3
CEBPA	1	**RUNX1**	3, 4, 8
DNMT3A	4, 8, 13, 15, 16, 18, 19, 20, 22, 23	**SETBP1**	3
EZH2	8, 17, 18	**SF3B1**	13–15, 17
FLT3	14, 20	**SRSF2**	1
IDH1	4	**TET2**	3, 9, 10, 11
IDH2	4	**TP53**	5–8
JAK2	12, 14	**U2AF1**	2, 6

Table III. ClearSeq Cancer^{HS} Gene List

ABL1	FGFR3	PIK3R1	CSF1R
JAK3	STK11	FANCF	NPM1
AR	IDH1	RUNX1	ERBB2
MAP2K1	WT1	FGFR2	PIK3CA
CDKN2A	JAK2	SRC	FANCC
NOTCH1	ALK	HRAS	RET
EGFR	KRAS	VHL	FGFR1
PDGFRA	BRAF	MAP2K2	SMO
FANCA	MET	AKT1	FLT3
PTEN	CTNNB1	KIT	TP53
FANCG	NRAS	ATM	IDH2
SMAD4	ERBB4	MAP2K4	

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U.S. and Canada
1-800-227-9770
agilent_inquiries@agilent.com

Europe
info_agilent@agilent.com

Asia Pacific
info_agilent@agilent.com

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