

QIAseq RNA Fusion XP Panels

Pan Heme

Cat. nos. 334602 JHS-3002Z-I2 and 334605 JHS-3002Z-96

For constructing molecularly barcoded libraries from RNA for gene fusion, exon skipping, gene expression, and RNA SNV/InDel analysis using digital NGS

The QIAseq RNA Fusion XP Pan Heme Panel permits the use of next-generation sequencing using 2,393 primers to detect fusions to 251 genes and RNA SNP/indels in 90 genes frequently observed in myeloid neoplasms as well as the relative gene expression of 172 genes with signatures relevant to myeloid neoplasms. Such frequently detected mutations and fusions are likely to be relevant or even important to myeloid neoplasm biology and may be used in translational research to classify samples with known phenotypes. Using the Catalogue of Somatic Mutations in Cancer (COSMIC), frequently mutated genes and frequently detected fusions were collected for leukemias, lymphomas, myelodysplastic syndromes (MDS), myeloproliferative neoplasms (MPN), and other myeloid neoplasms. For the same cancer types, additional fusions were also collected from the Archer Quiver Database, the Human Somatic Mutation Database (HSMD), requests and suggestions by QIAGEN KOLs and SMEs, and other peer-reviewed publications. Peer-reviewed publications were used to collect gene expression markers for leukemia and its subtypes, leukemia stem cells and their proliferation, and those with possible prognostic significance in terms of clinical outcome, chemotherapy resistance, treatment options, invasiveness, infiltration, and minimal residual disease. Genes whose expression is altered due to genetic alterations in myeloid neoplasms are also included. Using digital DNA sequencing, fusions to, relative gene expression of, and RNA SNP/indels in three different focused panels of genes relevant to myeloid neoplasms can be assessed with this primer pool.

For further details, consult the *QIAseq RNA Fusion XP Panels Handbook*.

Shipping and storage

The QIAseq RNA Fusion XP Panel Kit is shipped with dry ice (Box 1) and must be stored at -20°C upon arrival. Box 2 (QIAseq Beads) is shipped on cold packs and should be stored at 4°C . When stored under these conditions and handled correctly, the product can be kept based on the expiration date on each component without reduction in performance.

Note: Open the package and store the products appropriately immediately upon receipt.



Panel Contents

QIAseq RNA Fusion XP Panel catalog number	334602	334605
No. of preps	12	96
Box 1 of 2		
QIAseq RNA Fusion XP Panel	48 µL	384 µL
RP Primer II	12 µL	96 µL
EZ Reverse Transcriptase	15 µL	96 µL
BC3 Buffer, 5x	24 µL	192 µL
RNase Inhibitor	12 µL	96 µL
RH RNase	12 µL	96 µL
dNTP II	18 µL	144 µL
BLU Buffer, 10x	24 µL	192 µL
POL Enzyme	12 µL	96 µL
ERA Enzyme	120 µL	960 µL
ERA Buffer, 10x	60 µL	480 µL
DNA Ligase	120 µL	960 µL
Ligation Buffer, 5x	240 µL	2 × 1250 µL
TEPCR Buffer, 5x	60 µL	500 µL
RNA Buffer II, 5x	48 µL	2 × 384µL
TaqIT Plus enzyme	15 µL	2 × 120 µL
HotStarTaq® DNA Polymerase	30 µL	240 µL
Box 2 of 2		
QIAseq Beads	10 mL	55 mL

Gene Table: RNA Fusions

Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol
ABI1	ABI2	ABL1	ABL2	ACSL6	ACTN4
ADGRG7	AFDN	AFF1	AFF3	AFF4	AGGF1
ALK	ANLN	ARHGAP26	ARHGEF12	ASNS	ATF7IP
ATIC	ATXN2L	AUTS2	BAIAP2L1	BCL11A	BCL11B
BCL2	BCL6	BCL9	BCOR	BCR	BIRC3
BRAF	BTBD18	CASC5	CBFA2T3	CBFB	CBL
CCDC6	CCDC88C	CCND1	CCND3	CD28	CD74
CDK6	CEP170B	CHD1	CHIC2	CIITA	CLTC
CNTRL	CREBBP	CRLF2	CSF1R	CT45A2	CTLA4
DAB2IP	DCTN1	DDX10	DDX3X	DEK	DHH
DIAPH2	DUSP22	EBF1	EGFR	EIF4A1	ELL
ELN	EML1	EML4	EP300	EPOR	EP515
ERG	ESRRB	ETV6	EW5R1	FGFR1	FGFR1OP
FGFR3	FIP1L1	FLNA	FLT3	FNBP1	FOXO3
FOXO4	FOXP1	FRYL	FUS	GAS7	GATA1
GLIS2	GOT1	GPHN	GTF2H3	HAUS1	HLF
HNRNPUL1	HOXA11	HOXA13	HOXA9	HOXC11	HOXC13
HOXD13	IGLL5	IKZF2	IKZF3	INPP5D	IRF2BP2
ITK	JAK2	KANK1	KAT6A	KDM5A	KIAA1524
KIF5B	KLF2	KMT2A	KMT2E	LASPI	LMNA
LNP1	LPP	LYN	MALT1	MAML2	MAPK13
MAPRE1	MECOM	MEF2D	MET	MKL1	MLF1
MLLT1	MLLT10	MLLT11	MLLT3	MLLT6	MN1
MNX1	MSN	MYB	MYC	MYH11	MYO1F
NCKIP5D	NCOA2	NCOA4	NDE1	NF1	NFKB2
NOTCH1	NPM1	NSD1	NTRK1	NTRK3	NUMA1
NUP214	NUP98	P2RY8	PAG1	PAN3	PAX5
PAX8	PBX1	PCM1	PDCD1LG2	PDGFRA	PDGFRB
PDS5A	PHF23	PICALM	PIM1	PLEKHA6	PML
PPARG	PRDM16	PRKG2	PRRX1	PSIP1	PSMA2
PTK2B	PTPRR	RANBP2	RAP1GDS1	RARA	RBM15
RCS1	REL	RET	RHEBL1	ROS1	RPL22
RPN1	RUNX1	RUNX1T1	S100A7	SALL2	SARNP
SEC31A	SEMA6A	SEPTIN14	SEPTIN2	SEPTIN5	SEPTIN6
SEPTIN9	SET	SETD2	SFPQ	SH3GL1	SLC34A2
SLC45A3	SORBS2	SPI1	SQSTM1	SSBP2	STAT5B
STIL	STMN1	SYK	TACC3	TAF15	TAL1
TBLIXR1	TCF3	TCF7	TET1	TFG	THAP4
TMPRSS2	TNIP1	TOMM40	TOP1	TOP3A	TP63
TPM3	TPM4	TRIP11	TYK2	UBA2	USP42
USP9X	VAV1	WHSC1L1	WTIP	ZBTB16	ZCCHC7
ZFYVE19	ZMIZ1	ZMYM2	ZNF384	ZNF521	

Gene Table: Gene Expression

Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol
ABCA6	ABCB1	ADGRE5	ADGRG1	AHI1	AIM2
AKT1	ANGPT2	ANPEP	ASS1	AURKA	AURKB
BAALC	BAX	BCL10	BCL11A	BCL11B	BCL2
BCL3	BCL6	BCL9	BIRC2	BIRC5	BM1I
BRD4	BTG1	BTk	CASP8AP2	CCNA1	CCND1
CCND2	CCND3	CD19	CD1A	CD2	CD200
CD22	CD24	CD27	CD274	CD300A	CD33
CD34	CD38	CD3D	CD4	CD44	CD47
CD5	CD69	CD7	CD72	CD79A	CD79B
CD86	CD8A	CD96	CD99	CDC25A	CDK6
CDKN2A	CDKN2B	CEBPA	CEBPB	CEBPD	CEBPE
CEBPG	CLEC12A	CR2	CRLF2	CXCL12	CXCR4
EBF1	EPOR	ERG	ERVW-1	ETV6	FCGR2A
FCGR2B	FCRL4	FGFR3	FLT3	FOXM1	FOXO3
FOXP1	GATA2	GPR34	HAVCR2	HGF	HLA-DRA
HLA-DRB1	HOXA1	HOXA9	ID4	IGF2BP1	IKZF1
IL2RA	IL3	IL3RA	IL7	IRF4	IRS4
ITGA4	ITGA6	ITGAM	JUN	KCNN4	KDSR
KIT	KLF4	LAIR1	LCK	LEF1	LHX4
LIN28A	LMO1	LMO2	LPL	LYL1	MAF
MAFB	MALT1	MCL1	MECOM	MEIS1	MME
MMP9	MN1	MS4A1	MTCPI	MUC1	MYB
MYC	NBEAP1	NFKB2	NKX2-5	NOTCH1	NPM1
OLIG2	PAX5	PBX1	POU5F1	PRDM16	PTCH1
PTPRC	RANBP17	RB1	ROR1	RUNX1	SERPINI1
SMARCA4	SMYD2	SOX11	SOX2	SPI1	TAL1
TAL2	TCL1A	THBS1	THY1	TLX1	TLX3
TNF	TTN	UGT2B17	VEGFA	VPREB3	WHSC1
WNT3	WT1	XIAP	ZAP70		

Gene Table: RNA SNP/indel

Gene Symbol	Gene Symbol	Gene Symbol	Gene Symbol
ABL1	ALK	AMER1	APC
ARID1A	ASXL1	ATM	B2M
BCL2	BCOR	BRAF	BTK
CBL	CBLB	CD79B	CDKN2A
CHEK2	CNOT3	CREBBP	CSF3R
CTNNB1	CUX1	CXCR4	DAXX
DNM2	DNMT3A	EGFR	ETNK1
EZH2	FBXW7	FLT3	GATA2
GNA5	HLA-A	HRA5	ID3
IDH1	IDH2	IRS4	JAK1
JAK2	JAK3	KIT	KMT2D
KRAS	MAP2K1	MED12	MLH1
MPL	MSN	MYC	MYD88
NCOR1	NFKBIE	NOTCH2	NRAS
PAX5	PBRM1	PDGFRA	PIK3CA
PIK3R1	PLCG1	POT1	PPM1D
PTEN	PTPN11	RAD21	RET
RC57	RHOA	RUNX1	SETBP1
SF3B1	SH2B3	SMARCB1	SMO
SRSF2	STAT3	STAT5B	STAT6
TERT	TRRAP	U2AF1	WHSC1
WT1	XPO1	ZFXH3	ZMYM3
ZNF479	ZRSR2		

Functional Groupings

GENE FUSIONS:

Leukemia:

Acute Leukemia of Ambiguous Lineage: ABL1, AFF1, BCR, CT45A2, ETV6, EWSR1, GPHN, KMT2A, MLLT10, MN1, NUP214, PBX1, SET, TCF3, ZNF384.

Acute Lymphoblastic Leukemia (ALL): ABL1, ABL2, ACTN4, AFDN, AFF1, AFF3, AFF4, AGGF1, ANLN, ASNS, ATF7IP, AUTS2, BCL11B, BCL9, BCR, BTBD18, CASC5, CREBBP, CRLF2, CSF1R, DDX3X, EBF1, ELL, ELN, EML1, EP300, EPOR, EPS15, ESRRB, ETV6, EWSR1, FGFR1, FGFR1OP, FLT3, FOXO4, FOXP1, FRYL, GAS7, GPHN, HLF, HNRNPUL1, INPP5D, JAK2, KMT2A, KMT2E, LNP1, MAML2, MEF2D, MLLT1, MLLT10, MLLT3, MN1, MNX1, MYB, MYC, NCOA2, NOTCH1, NUP214, NUP98, P2RY8, PAG1, PAX5, PBX1, PCM1, PDGFRB, PICALM, PML, PRDM16, RAPIGDS1, RARA, RCSD1, RUNX1, SALL2, SET, SFPQ, SPI1, SSBP2, STIL, STMN1, TAF15, TAL1, TCF3, TCF7, TET1, TYK2, USP9X, ZBTB16, ZCCHC7, ZMIZ1, ZMYM2, ZNF384, ZNF521.

Acute Myeloid Leukemia (AML): ABI1, ABI2, ABL1, AFDN, AFF1, AFF4, ALK, ANLN, ARHGAP26, ARHGEF12, BCOR, BCR, CASC5, CBFA2T3, CBFB, CBL, CCDC88C, CEP170B, CHD1, CHIC2, CREBBP, DAB2IP, DDX10, DEK, DHH, DIAPH2, ELL, EP300, EPS15, ERG, ETV6, FGFR1, FIP1L1, FLNA, FNBP1, FOXO3, FOXO4, FRYL, FUS, GAS7, GATA1, GLIS2, GPHN, HAUS1, HOXA9, HOXC11, HOXC13, HOXD13, IRF2BP2, JAK2, KAT6A, KDM5A, KIAA1524, KMT2A, LASP1, LNP1, LPP, LYN, MAML2, MECOM, MKL1, MLLT1, MLLT10, MLLT11, MLLT3, MLLT6, MN1, MNX1, MYB, MYH11, MYO1F, NCKIPSD, NCOA2, NF1, NPM1, NSD1, NTRK3, NUMA1, NUP214, NUP98, PAN3, PBX1, PCM1, PDGFRA, PDGFRB, PDS5A, PHF23, PICALM, PML, PRDM16, PRRX1, PSIP1, PSMA2, PTPRR, RANBP2, RARA, RBM15, RHEBL1, RPL22, RPN1, RUNX1, RUNX1T1, SARNP, SEPT2, SEPT5, SEPT6, SEPT9, SET, SH3GL1, SORBS2, STAT5B, TAF15, TCF3, TET1, TFG, TOP1, TOP3A, TRIP11, TYK2, UBA2, USP42, WHSC1L1, WTIP, ZBTB16, ZFYVE19, ZNF384.

Acute Myelomonocytic Leukemia (AMML): FLNA, HOXD13, NUP98.

B-Cell Acute Lymphoblastic Leukemia (B-ALL): ABL1, ACTN4, AFF1, AFF3, AFF4, ATF7IP, BCR, BTBD18, CRLF2, EPS15, ERG, ESRRB, ETV6, EWSR1, FUS, GAS7, JAK2, KMT2A, MAPRE1, MLLT1, NUP214, P2RY8, PAX5, PBX1, PCM1, RUNX1, SET, SSBP2, TCF3, USP9X, ZNF384, ZNF521.

Blast Phase Chronic Myeloid Leukemia: ABL1, BCR, ETV6, JAK2.

Chronic Eosinophilic Leukemia: ACSL6, TNIP1.

Chronic Lymphocytic Leukemia (CLL): MYC, NOTCH1.

Chronic Myeloid Leukemia (CML): ABL1, BCR, CCDC88C, ETV6, HOXA11, HOXA13, JAK2, MECOM, MN1, NDE1, NUP98, PCM1, PDGFRB, RUNX1.

Chronic Myelomonocytic Leukemia (CMML): CREBBP, ELL, ETV6, KMT2A, MN1.

Myelodysplastic Syndromes (MDS): ABL1, ACTN4, ALK, CASC5, CREBBP, DEK, ERG, ETV6, FRYL, FUS, HOXD13, JAK2, KMT2A, LNP1, MAML2, MECOM, MLF1, MN1, MNX1, NDE1, NPM1, NUP214, NUP98, PCM1, PDGFRB, PRDM16, PTPRR, RANBP2, RUNX1, RUNX1T1, TOP1.

Myeloproliferative Neoplasms (MPN): ABL1, ACSL6, BCR, ETV6, FGFR1, FGFR1OP, FIP1L1, FLT3, HOXA9, HOXD13, JAK2, LYN, MECOM, MLF1, MN1, NPM1, NUP98, PDGFRB, PRKG2, PSIP1, RARA, RUNX1, TNIP1, ZMYM2.

T-Cell Acute Lymphoblastic Leukemia (T-ALL): ABL1, AFDN, AGGF1, ASNS, BCL11B, BCR, CASC5, DDX3X, ETV6, JAK2, KMT2A, KMT2E, MLLT1, MLLT10, NOTCH1, NUP214, PBX1, RUNX1, SALL2, SET, SPI1, STIL, STMN1, TAL1, TCF3, TCF7.

Other Leukemias: BCL11B, IKZF2, IKZF3, IRF2BP2, MYC, NPM1, PDCD1LG2, SETD2, TYK2.

Lymphomas:

Acute Lymphoblastic Lymphomas: BCL11B, CREBBP, EBF1, KMT2A, MLLT10, MYC, P2RY8, PRDM16, STIL.

Anaplastic Large Cell Lymphomas: ADGRG7, ALK, ATIC, CLTC, MSN, MYC, NPM1, TFG, TPM3, TPM4.

Angioimmunoblastic T Cell Lymphomas: CD28, CTLA4, FIP1L1, PDGFRA.

Burkitt Lymphomas: BCL6, MYC, PBX1, TCF3.

Diffuse Large B Cell Lymphomas (DLBCL): ALK, BCL11A, BCL6, CCND3, CIITA, CLTC, IGLL5, LPP, MAPK13, MYC, NPM1, PIM1, REL, SQSTM1, TBL1XR1, TOMM40, TP63, ZCCHC7.

Follicular Lymphomas: AFF3, BCL2, BCL6, CIITA, MYC, TBL1XR1, TP63.

Granulocytic Sarcomas: RUNX1, RUNX1T1.

Hodgkin Lymphomas: ALK, CIITA, JAK2, NPM1, SEC31A.

Inflammatory Myofibroblastic Tumors: ALK, DCTN1.

Lymphoblastic Lymphomas: BCR, CRLF2, EPOR, ETV6, FGFR1, NOTCH1, PBX1, PDGFRB, RARA, ZCCHC7.

Lymphoblastic T Cell Lymphomas: BCR, ETV6, FGFR1, FIP1L1, LYN, PDGFRA.

Mantle Cell Lymphomas: CCND3, MYC.

Mediastinal Large B Cell Lymphomas (MLBL): CIITA, PDCD1LG2.

Mucosa-Associated Lymphoid Tissue (MALT) Lymphomas: BCL6, BIRC3, CCND3, MALT1, MYC.

Peripheral T Cell Lymphomas: ALK, ETV6, FGFR3, IKZF2, ITK, MYO1F, NPM1, S100A7, SYK, TBL1XR1, THAP4, TP63, VAV1.

Precursor T Cell Lymphoblastic Lymphomas: ABL1, JAK2, NUP214, PCM1, SET.

T Cell Lymphomas: ATXN2L, BCL11B, FGFR1, IKZF2, JAK2.

Other Lymphomas: BCL6, BIRC3, CBFB, CCND1, CCND3, CDK6, CHIC2, DEK, DUSP22, EIF4A1, KMT2A, MALT1, MKL1, MLF1, MLLT10, MYC, NFKB2, PICALM, PRDM16.

Myelodysplastic Syndromes (MDS): ABL1, ACTN4, ALK, CASC5, CREBBP, DEK, DIAPH2, ERG, ETV6, FGFR1, FRYL, FUS, GOT1, HOXA11, HOXA13, HOXD13, JAK2, KMT2A, LNP1, MAML2, MECOM, MLF1, MN1, MNX1, MYH11, NDE1, NPM1, NUP214, NUP98, PAN3, PCM1, PDGFRB, PRDM16, PSMA2, PTPRR, RANBP2, RUNX1, RUNX1T1, SEPT9, SYK, TOP1, ZMYM2.

Myeloproliferative Neoplasms (MPN): ABL1, ACSL6, BCR, CNTRL, ETV6, FGFR1, FGFR1OP, FIP1L1, FLT3, FOXP1, HOXA9, HOXD13, JAK2, KANK1, LYN, MECOM, MLF1, MN1, NPM1, NUP98, PCM1, PDGFRA, PDGFRB, PRKG2, PSIP1, RARA, RUNX1, TNIP1.

Other Hematological Malignancies:

Eosinophilia: ETV6, FOXP1, LYN, PDGFRA.

Langerhans Cell Histiocytosis: NTRK3, PLEKHA6.

Plasma Cell Myelomas: ABL1, BCR.

Polycythemia Vera: GTF2H3.

Severe Thrombocytopenia: KANK1, PDGFRB.

Other Myeloid Neoplasms: KLF2, PTK2B, SEMA6A.

Commercial Control Samples: ALK, BAIAP2L1, BRAF, CCDC6, CD74, EGFR, EML4, ERG, ETV6, FGFR3, KIF5B, LMNA, MET, NCOA4, NTRK1, NTRK3, PAX8, PPARG, RET, ROS1, SEPT14, SLC34A2, SLC45A3, TACC3, TFG, TMPRSS2, TPM3.

GENE EXPRESSION:

General Leukemia Markers: ANPEP, CD19, CD200, CD33, CD34, CD38, CR2, FOXM1, FOXO3, HOXA9, ITGA6, KIT, MS4A1, RUNX1.

Leukemia Subtype Markers:

Acute Lymphoblastic Leukemia (ALL): ANPEP, BTG1, CASP8AP2, CD19, CD1A, CD2, CD22, CD33, CD5, CD7, CD79A, CD8A, CR2, ETV6, HLA-DRA, HLA-DRB1, IL2RA, JUN, KIT, LMO1, LMO2, LYL1, MEI51, MME, MS4A1, MYC, PBX1, PTPRC, RB1, VEGFA, WT1.

B Cell Acute Lymphoblastic Leukemia (B-ALL): BTG1, CD300A, CD72, CD79A, CD79B, CD86, CDKN2A, CDKN2B, CRLF2, EBF1, ETV6, HOXA9, IKZF1, PAX5, RB1.

T Cell Acute Lymphoblastic Leukemia (T-ALL): BTK, CD27, CD4, KCNN4, LMO1, LMO2, LYL1, MMP9, RUNX1, SERPINI1, TAL1, THBS1, TLX1, TLX3, VPREB3.

Acute Myeloid Leukemia (AML): ADGRE5, ASS1, BAALC, BCL11B, BIRC5, CD200, CD300A, CD44, CD86, CD96, CD99, CLEC12A, ERG, FCGR2A, FLT3, HAVCR2, IL2RA, JUN, KIT, KLF4, LEF1, MECOM, MEI51, MMP9, NPM1, PTPRC, THBS1, VEGFA, WT1.

Chronic Lymphocytic Leukemia (CLL): ABCA6, AIM2, AKT1, BAX, BCL2, BIRC2, BTK, CD19, CD200, CD24, CD27, CD5, CD79B, CXCR4, IL7, ITGA4, ITGAM, JUN, KCNN4, LAIR1, LEF1, MCL1, MMP9, MS4A1, ROR1, SERPINI1, SOX11, THBS1, TNF, TTN, VEGFA, VPREB3, WNT3.

Chronic Myeloid Leukemia (CML): AURKA, AURKB, IL2RA, JUN, KIT, PTCH1, PTPRC.

Other Leukemia Subtypes: CD72, IL2RA, SPI1.

Leukemia Stem Cell & Proliferation Markers: ADGRG1, BAALC, BMI1, CD33, CD34, CD44, CD47, CD96, CD99, CLEC12A, CXCL12, CXCR4, ERG, FCGR2A, HAVCR2, IL2RA, IL3RA, KIT, KLF4, LAIR1, LIN28A, MYC, POU5F1, PTPRC, SOX2, THY1, WT1.

Possible Prognostic Significance:

Indicator of Clinical Outcome in Leukemia: AURKB, BAALC, BIRC5, ERG, FOXO3, GATA2, MECOM, MEIS1, RUNX1, SPI1, WT1.

Acute Lymphoblastic Leukemia (ALL): ABCB1, AKT1, ANPEP, BIRC5, CD33, CD3D, CD44, FLT3, HOXA9, IKZF1, JUN, MME, MYC, PAX5, SMYD2.

B Cell Acute Lymphoblastic Leukemia (B-ALL): ANPEP, CD33, CRLF2, JUN, MS4A1.

T Cell Acute Lymphoblastic Leukemia (T-ALL): BCL11B, BMI1, LMO1, LMO2, LYL1, MYC, TAL1, TLX1, TLX3.

Acute Myeloid Leukemia (AML): ABCB1, ANGPT2, BAALC, BCL2, BIRC2, BIRC5, BMI1, CCNA1, CD200, CD34, CD4, CD44, CD47, CD96, CLEC12A, CXCL12, CXCR4, ERG, GATA2, HAVCR2, HGF, IL2RA, IL3RA, KLF4, LEF1, MECOM, MEIS1, MN1, MYC, RUNX1, SOX11, SOX2, SPI1, WT1, XIAP.

Chronic Lymphocytic Leukemia (CLL): ABCA6, ANGPT2, BCL2, CD24, CD38, CD69, ITGA4, KCNN4, LAIR1, LPL, MS4A1, MYC, NOTCH1, ROR1, SOX11, TTN, UGT2B17, VPB3, WNT3, ZAP70.

Chronic Myeloid Leukemia (CML): AURKA, AURKB, LIN28A, MCL1, PTCH1.

Chemotherapy Resistance Related: AKT1, AURKB, BAALC, BCL2, BIRC2, CD274, CD44, CD47, ERG, HLA-DRA, HLA-DRB1, IL3RA, MCL1, MYC, XIAP.

Hypoxia & Oxidative Stress Related: ANGPT2, VEGFA.

Treatment Target or Treatment Indicator: ASS1, BMI1, CASP8AP2, CD33, CD47, CD69, CD96, CDC25A, CDKN2A, CDKN2B, CLEC12A, CXCR4, FLT3, FOXM1, FOXO3, HAVCR2, IL3RA, ITGAM, KLF4, LMO2, MS4A1, MYC, PTCH1, SERPINI1, SMARCA4, TAL1, ZAP70.

Associated with Invasiveness or Infiltration into Central Nervous System: CXCL12, CXCR4, ZAP70.

Minimal Residual Disease: ADGRE5, BAALC, BCL2, CD19, CD200, CD24, CD300A, CD44, CD47, CD69, CD72, CD79B, CD86, CD99, CLEC12A, HAVCR2, IL2RA, IL3RA, ITGA6, NPM1, PBX1, WT1.

Mechanistic Role in Pathogenesis: BCL11B, BCL2, BMI1, ERG, FOXM1, GATA2, HOXA9, LMO2, LPL, MEIS1, NOTCH1, PAX5, SPI1, TAL1, TLX1, TLX3, TNF, VEGFA, WT1.

Expression Altered due to Genetic Alterations:

Acute Lymphoblastic Leukemia (ALL): AH11, BCL11A, BCL2, BCL9, BRD4, CCND2, CEBPA, CEBPB, CEBPD, CEBPE, CEBPG, CRLF2, EPOR, ETV6, HOXA1, ID4, IGF2BP1, IL3, IRF4, IRS4, LCK, LHX4, LMO1, LMO2, LYL1, MYB, MYC, NKX2-5, NOTCH1, OLIG2, TAL2, TLX1, TLX3.

Acute Myeloid Leukemia (AML): MECOM, NKX2-5, RANBP17, TCL1A, TLX3.

Lymphomas: BCL10, BCL2, BCL3, BCL6, BCL9, CCND1, CCND2, CCND3, CD44, CDK6, ERVW-1, FCGR2B, FCRL4, FOXP1, GPR34, IRF4, KDSR, MALT1, MTCPI, MUC1, MYC, NBEAP1, NFKB2, PAX5, PRDM16.

Myelomas: FGFR3, MAF, MAFB, NSD2.

Other Leukemia Subtypes & Other Genetic Alterations: BAALC, BCL11B, CRLF2, ERG, KIT, LMO1, LPL, NPM1, TAL1, ZAP70.

RNA SNP/INDELS:

Leukemia:

Acute Lymphoblastic Leukemia (ALL): ATM, BRAF, CDKN2A, CREBBP, CSF3R, DNMT3A, EGFR, FBXW7, GATA2, HRAS, MAP2K1, MLH1, PAX5, PDGFRA, PTEN, SMARCB1.

Acute Myeloid Leukemia (AML): ASXL1, ATM, BCOR, BRAF, CDKN2A, CHEK2, CREBBP, CSF3R, DAXX, DNMT3A, FLT3, GATA2, IDH1, IDH2, JAK1, JAK3, KIT, KMT2D, KRAS, MAP2K1, MPL, MYC, NRAS, PBRM1, PDGFRA, PPM1D, PTEN, PTPN11, RAD21, RET, RUNX1, SMARCB1, SRSF2, U2AF1, WT1.

Chronic Lymphocytic Leukemia (CLL): BRAF, CHEK2, CSF3R, MAP2K1, TERT.

Chronic Myeloid Leukemia (CML): ABL1, CDKN2A, CREBBP, CSF3R, FBXW7, GATA2.

Chronic Myelomonocytic Leukemia (CMML): CSF3R, HRAS, SRSF2.

Chronic Neutrophilic Leukemia (CNL): CSF3R.

Multiple Myeloma: ATM, BRAF, CDKN2A, EGFR, FBXW7, HRAS, MYC, PTEN, SMARCB1.

Myelodysplastic Syndromes (MDS): CDKN2A, CSF3R, ETNK1, GNAS, HRAS, RAD21, SETBP1, SRSF2, U2AF1, XPO1, ZRSR2.

Myeloid Malignancies: CBL, CBLB, DNMT3A, EZH2.

Myeloproliferative Neoplasms (MPN): ABL1, ASXL1, JAK2, JAK3, KRAS, MPL, NRAS, SETBP1, SF3B1, SH2B3, SRSF2.

Myelofibrosis: CHEK2, IDH1, IDH2, SRSF2.

Other Myeloid Neoplasms: BRAF, CDKN2A, CUX1, FBXW7, HRAS, MYD88, PTEN, STAT3.

Lymphomas:

AIDS-Related Lymphomas: EZH2.

Anaplastic Large Cell Lymphomas: ALK, CDKN2A, DNMT3A, NRAS, STAT3.

Angioimmunoblastic T Cell Lymphomas: ALK, APC, ARID1A, ASXL1, ATM, BRAF, CDKN2A, CREBBP, CTNNB1, DNMT3A, EZH2, FBXW7, IDH2, JAK1, JAK3, KIT, KMT2D, KRAS, MED12, PLCG1, RHOA, STAT3, WT1, XPO1, ZFH3.

B Cell Lymphomas: ARID1A, ATM, B2M, BCL2, BCOR, BRAF, CD79B, CDKN2A, CREBBP, CTNNB1, CXCR4, DNMT3A, EZH2, JAK3, KIT, KMT2D, MAP2K1, MYD88, PIK3CA, PPM1D, PTEN, RHOA, STAT3.

Burkitt Lymphomas: APC, ARID1A, ATM, CD79B, CDKN2A, CREBBP, FBXW7, HLA-A, ID3, KRAS, MYC, MYD88, NRAS, PAX5, PIK3CA, PIK3R1, PTEN, RHOA, SRSF2.

Small Lymphocytic Lymphomas: ALK, APC, ARID1A, ASXL1, ATM, BCL2, BCOR, BRAF, BTK, CD79B, CDKN2A, CNOT3, CREBBP, CXCR4, DNMT3A, FBXW7, GNAS, IRF4, JAK1, JAK3, KIT, KMT2D, KRAS, MAP2K1, MED12, MSN, MYC, MYD88, NCOR1, NFKB1, NOTCH2, NRAS, PAX5, PIK3CA, PIK3R1, PLCG1, POT1, PPM1D, PTEN, RGS7, SF3B1, STAT5B, STAT6, TERT, TRRAP, XPO1, ZFH3, ZMYM3, ZNF479.

Cutaneous T Cell Lymphomas: KRAS, PTEN.

Diffuse Large B Cell Lymphomas (DLBCL): ALK, AMER1, APC, ARID1A, ASXL1, ATM, B2M, BCL2, BCOR, BRAF, BTK, CD79B, CDKN2A, CNOT3, CREBBP, CTNNB1, CXCR4, DNMT3A, EZH2, FBXW7, HLA-A, ID3, IDH2, IRF4, JAK1, JAK3, KIT, KMT2D, KRAS, MAP2K1, MED12, MSN, MYC, MYD88, NCOR1, NFKB1, NOTCH2, NRAS, NSD2, PAX5, PIK3CA, PIK3R1, PLCG1, POT1, PPM1D, PTEN, RGS7, RHOA, SF3B1, SMO, SRSF2, STAT3, STAT5B, STAT6, TERT, TRRAP, WT1, XPO1, ZFH3, ZNF479.

Diffuse Red Pulp Small B Cell Lymphomas: MYD88, NOTCH2.

Enteropathy-Type T Cell Lymphomas: STAT5B.

Follicular Lymphomas: AMER1, ARID1A, ATM, B2M, BCL2, BCOR, BRAF, BTK, CD79B, CDKN2A, CREBBP, CXCR4, DNMT3A, EZH2, FBXW7, ID3, IDH2, KMT2D, MAP2K1, MED12, MYD88, NOTCH2, NRAS, PIK3R1, PPM1D, PTEN, RGS7, RHOA, SRSF2, STAT6, ZMYM3.

Gamma-Delta T Cell Lymphomas: STAT3, STAT5B.

Hepatosplenic T Cell Lymphomas: STAT3, STAT5B.

Hodgkin Lymphomas: ARID1A, ASXL1, B2M, BCOR, CDKN2A, DNMT3A, EZH2, NFKBIE, NRAS, PAX5, PIK3R1, PPM1D, SF3B1.

Lymphoplasmacytic Lymphomas: ARID1A, BTK, CD79B, CXCR4, DNMT3A, MYD88.

Mucosa-Associated Lymphoid Tissue (MALT) Lymphomas: MYD88, NOTCH2.

Mantle Cell Lymphomas: ARID1A, ASXL1, ATM, B2M, BCOR, BRAF, BTK, CDKN2A, CREBBP, DNMT3A, IDH2, KMT2D, KRAS, MED12, NCOR1, NFKBIE, NOTCH2, NRAS, NSD2, PAX5, POT1, PPM1D, PTEN, STAT3, TERT, ZFH3.

Marginal Zone Lymphomas: AMER1, ARID1A, ASXL1, ATM, BRAF, CD79B, CREBBP, CXCR4, DNMT3A, EZH2, FBXW7, GNAS, JAK3, KIT, KMT2D, MAP2K1, MYD88, NFKBIE, NOTCH2, PIK3R1, RHOA, SRSF2, TRRAP, XPO1.

Mycosis Fungoides (Sezary Syndrome): AMER1, ARID1A, ATM, BCOR, CDKN2A, DNMT3A, JAK1, JAK3, KMT2D, KRAS, NCOR1, NRAS, PIK3CA, PLCG1, POT1, PTEN, STAT3, STAT5B.

NK-T Cell Lymphomas: ALK, AMER1, APC, ARID1A, ASXL1, ATM, B2M, BCOR, BRAF, CTNNB1, DNMT3A, EZH2, FBXW7, HLA-A, JAK1, JAK3, KIT, KMT2D, KRAS, MED12, NCOR1, NOTCH2, NRAS, POT1, RGS7, RHOA, SMO, STAT3, STAT5B, WT1, XPO1, ZFH3.

Peripheral T Cell Lymphomas: ALK, ARID1A, ASXL1, ATM, CDKN2A, CTNNB1, DNMT3A, IDH2, IR54, KIT, KMT2D, KRAS, MAP2K1, MSN, NRAS, PLCG1, PTEN, RGS7, RHOA, STAT3, STAT5B, TRRAP, XPO1, ZFH3, ZNF479.

Precursor T Cell Lymphoblastic Lymphomas: CTNNB1, FBXW7, NRAS, WT1.

Primary Central Nervous System Lymphomas: B2M, BCL2, CD79B, CDKN2A, CXCR4, DNMT3A, HLA-A, JAK3, KIT, KRAS, MYD88, NOTCH2, POT1, STAT3, STAT5B, TERT, TRRAP, WT1.

Primary Effusion Lymphomas: CDKN2A, PTEN.

Ordering Information

Product	Contents	Cat. no.
QIAseq RNA Fusion XP Panel (12)	Kit containing ALL reagents (except indices) sufficient to process 12 samples for RNA sequencing analysis of gene fusions, gene expression and RNA SNP/InDel	334602
QIAseq RNA Fusion XP Panel (96)	Kit containing ALL reagents (except indices) sufficient to process 96 samples for RNA sequencing analysis of gene fusions, gene expression and RNA SNP/InDel	334605
QIAseq RNA Fusion XP Custom Panel	Kit containing reagents for first-strand synthesis, second- strand synthesis, end-repair/A-addition, gene-specific amplification, and QIAseq Beads for RNA Fusion XP sequencing, custom panel for 96 samples	334625
QIAseq RNA Fusion XP Booster Panel	Pool of primers used in combination with either catalogued or custom panels	334635
QIAseq 8-Unique Dual Index Set A (48)	Box containing unique dual-indexed adapters, for indexing up to 8 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 48 samples; the first of 2 sets required for multiplexing up to 16 samples	333715
QIAseq 8-Unique Dual Index Set B (48)	Box containing unique dual-indexed adapters, for indexing up to 8 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 48 samples; the second of 2 sets required for multiplexing up to 16 samples	333716
QIAseq 96-Unique Dual Index Set A (384)	Box containing unique dual-indexed adapters, for indexing up to 96 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 384 samples; the first of 2 sets required for multiplexing up to 192 samples	333725
QIAseq 96-Unique Dual Index Set B (384)	Box containing unique dual-indexed adapters, for indexing up to 96 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 384 samples; the second of 2 sets required for multiplexing up to 192 samples	333735
QIAseq 96-Unique Dual Index Set A V2 (96) *	Box containing unique dual-indexed adapters, for indexing up to 96 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 96 samples; four sets are required for multiplexing up to 384 samples	331745

Product	Contents	Cat. no.
QIAseq 96-Unique Dual Index Set B V2 (96) *	Box containing unique dual-indexed adapters, for indexing up to 96 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 96 samples; four sets are required for multiplexing up to 384 samples	331755
QIAseq 96-Unique Dual Index Set C V2 (96) *	Box containing unique dual-indexed adapters, for indexing up to 96 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 96 samples; four sets are required for multiplexing up to 384 samples	331765
QIAseq 96-Unique Dual Index Set D V2 (96) *	Box containing unique dual-indexed adapters, for indexing up to 96 samples for QIAseq Targeted Panel sequencing on Illumina platforms; enough to process a total of 96 samples; four sets are required for multiplexing up to 384 samples	331775
QIAseq 12-Index L (48)	Box containing oligos, enough for a total of 48 samples, for indexing up to 12 samples for targeted panel sequencing on Ion Torrent platforms	333764
QIAseq 96-Index L (384)	Box containing oligos in arrays, enough for a total of 384 samples, for indexing up to 96 samples for targeted panel sequencing on Ion Torrent platforms	333777
Human XpressRef Universal Total RNA	2 tubes each containing 100 µg human RNA at 1mg/mL	338112
RNeasy Mini Kit (50)	50 RNeasy Mini Spin Columns, Collection Tubes (1.5 mL and 2 mL), RNase-free reagents, and buffers	74104
RNeasy FFPE Kit (50)	50 RNeasy MinElute® Spin Columns, Collection Tubes, Proteinase K, RNase-Free DNase I, DNase Booster Buffer, RNase-free buffers, and Nuclease-Free Water	73504
PAXgene® Blood RNA Kit (50)	50 PAXgene Spin Columns, 50 PAXgene Shredder Spin Columns, Processing Tubes, RNase-Free DNase I, RNase-free reagents, and buffers; to be used in conjunction with PAXgene Blood RNA Tubes	762174
RNeasy Micro Kit (50)	50 RNeasy MinElute Spin Columns, Collection Tubes (1.5 mL and 2 mL), RNase-free DNase I, Carrier RNA, RNase-free reagents, and buffers	74004
QIAamp® RNA Blood Mini Kit (50)	50 QIAamp Mini Spin Columns, 50 QIAshredder Spin Columns, Collection Tubes (1.5 mL and 2 mL), RNase-free reagents, and buffers	52304

Product	Contents	Cat. no.
QIAseq FastSelect – rRNA HMR Kit (24)	Includes 3 tubes of QIAseq FastSelect reagent for rRNA removal: sufficient for 24 reactions from human, mouse, and rat samples	334386
QIAseq FastSelect – rRNA/Globin Kit (24)	Includes 1 tube of QIAseq FastSelect reagent for rRNA removal and 1 tube of QIAseq FastSelect reagent for globin mRNA removal	335376

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