

QIAseq Targeted RNA Panels

Human Immuno-Oncology

Cat. no. 333005 RHS-009Z

For gene expression profiling by RNA sequencing with laboratory-verified primer sets

The Human Immuno-Oncology QIAseq Targeted RNA Panel profiles the expression of 990 genes relevant to host immune responses against tumors. Immunotherapy, now commonly known as the fourth pillar of cancer treatment, brings new hope to otherwise difficult cases. However, not all cancer types or all patients with the same cancer type respond equally to the same treatment, some patients' regress only to relapse later, and some immunotherapy treatments cause side-effects resembling autoimmune disorders. Therefore, basic research, such as gene expression analysis, is required and ongoing to better understand the biology of immuno-oncology and to discover more biomarkers identifying successfully responsive patients. For example, the expression of the immune checkpoint molecules in this panel on both tumor and immune cells prevents cellular immune responses from developing against tumor cells and as such may serve as potential biomarkers. Infiltration of the tumor microenvironment with the correct balance of active effector immune cells over suppressive dendritic or exhausted T cells most strongly correlates with effective immunotherapy and host immune responses. The several immune cell-specific and immune response-specific gene expression signatures in this panel have been all been used to examine immune response status. Finally, gene expression in other biological processes important to these immune responses (such as antigen processing and presentation, the interferon gamma response, and the cytosolic DNA-sensing pathway) have also proven important to analyze. Samples used for such analyses include whole tumor biopsies, tumor or immune cells sorted from those biopsies and even immune cells sorted from whole blood as a noninvasive surrogate. Gene expression changes over immunotherapy treatment courses correlate with either tumor regression and immunotherapy success or tumor resistance and immunotherapy failure. Using digital RNA sequencing, the expression of 990 genes with established roles in immuno-oncology can be analyzed with this primer pool.

For further details, consult the *QIAseq Targeted RNA Panel Handbook*.

Panel is enough for 96 samples.

Shipping and storage

QIAseq Targeted RNA Panels are shipped in two boxes: box 1 of 2 is shipped on dry ice and box 2

of 2 is shipped on blue ice. For long-term storage, keep the contents of box 1 at -20°C and the contents of box 2 at 4°C . If stored under these conditions, the panels are stable for 8 months after receipt.

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



Panel Contents

Contents	Volume
RNase-free water	1000 μ l
Control P2	96 μ l
Buffer GE	192 μ l
RE3 Reverse Transcriptase Mix	192 μ l
5x Buffer BC3	384 μ l
QIAseq RNA 5x Buffer	2400 μ l
HotStarTaq DNA Polymerase (6U / μ l)	480 μ l
RS2 Primer (10 μ M)	160 μ l
BC Primer Mix	640 μ l
LA Primer Mix	640 μ l
QIAseq Beads	32 ml

Gene table: QIAseq Targeted RNA Panels

Gene symbol	Gene symbol	Gene symbol	Gene symbol
ABCB9	ABCC4	ABCG2	ABHD2
ABR	ABT1	ACACB	ACP5
ACSL4	ACTG1	ACVR1B	ACVR2B
ADAP2	ADAR	ADARB1	ADAT2
ADCY1	ADCYAP1	ADGRE1	ADORA2A
ADPRH	AES	AHCYL1	AHI1
AIM2	AKAP3	AKT3	ALDH1B1
ALPL	AMHR2	ANK1	ANKRD10
ANOS1	ANP32B	ANPEP	APBA2
APBB2	APOD	APOE	APOL3
APP	AQP3	AR	ARG1
ARG2	ARHGAP8	ARL6IP5	ASF1A
ASS1	ATF2	ATF4	ATF7IP
ATG7	ATL2	ATM	ATP1B3
ATP9A	B2M	B3GAT1	BABAM1
BACH2	BANK1	BATF	BCAP31
BCAT1	BCL11A	BCL11B	BCL2
BCL2L1	BIRC5	BLK	BLNK
BLVRB	BNIP3L	BORA	BRDT
BST1	BST2	BTG3	BTLA
BTNL2	C10orf54	C16orf13	C1orf61
C9orf156	CA4	CADM1	CALB2
CALCOCO2	CALR	CAMLG	CANX
CAPZB	CARD9	CASP1	CASP8
CAT	CBLB	CCDC33	CCL1
CCL11	CCL13	CCL17	CCL19

Gene symbol	Gene symbol	Gene symbol	Gene symbol
CCL2	CCL21	CCL22	CCL25
CCL27	CCL3	CCL4	CCL4L2
CCL5	CCL7	CCR10	CCR2
CCR3	CCR4	CCR5	CCR6
CCR7	CCR8	CCR9	CD14
CD160	CD163	CD177	CD19
CD1A	CD1B	CD1C	CD1D
CD1E	CD2	CD200	CD200R1
CD207	CD209	CD22	CD244
CD247	CD248	CD27	CD274
CD276	CD28	CD33	CD34
CD36	CD38	CD3D	CD3E
CD3G	CD4	CD40	CD40LG
CD44	CD46	CD48	CD5
CD52	CD5L	CD6	CD68
CD69	CD7	CD70	CD72
CD74	CD79A	CD80	CD82
CD83	CD84	CD86	CD8A
CD8B	CD93	CD96	CDA
CDC14A	CDC25C	CDC5L	CDC7
CDK5R1	CDKN2AIP	CEACAM3	CEACAM8
CENPF	CEP68	CH25H	CHGB
CHI3L1	CHI3L2	CHIT1	CHRM3-AS2
CHRNA6	CHST2	CHST7	CHUK
CIITA	CLC	CLCF1	CLEC10A
CLEC4C	CLEC5A	CLIC2	CLUAP1
CMA1	CMAHP	COCH	COL3A1
COL8A2	COLEC12	CPA3	CR2
CREB1	CREB3L2	CREB5	CREBZF
CRISP2	CRISPLD2	CRTAM	CSF1
CSF1R	CSF2	CSF2RB	CSF3R
CSNK1E	CSPG4	CST7	CTAG1A
CTAG1B	CTAGE5	CTLA4	CTNS
CTSB	CTSC	CTSG	CTSK
CTSL	CTSS	CTSW	CUL5
CX3CL1	CXCL1	CXCL10	CXCL11
CXCL12	CXCL13	CXCL14	CXCL2
CXCL3	CXCL5	CXCL8	CXCL9
CXCR1	CXCR2	CXCR3	CXCR5
CXCR6	CYBB	CYLD	CYP4F3
CYSLTR2	DCSTAMP	DCT	DDX17
DDX50	DDX58	DGKE	DGKI
DHFR	DNAJB1	DNASE2B	DOCK9
DOK5	DPP4	DTNB	DUSP2

Gene symbol	Gene symbol	Gene symbol	Gene symbol
DUSP4	DUSP5	DYSF	EBI3
EDN1	EDN2	EDN3	EDNRA
EDNRB	EGFL6	EGR2	EHD1
EIF3L	EMP1	EMP3	ENTPD1
EOMES	EPHA2	EPN2	EPOR
EPPIN	ERAP1	ERAP2	ERBB2
ERI1	ETV7	EVI5	EWSR1
F13A1	F2	FABP4	FAM111A
FAM153B	FAM3C	FAP	FAS
FASLG	FBRSL1	FCAR	FCGR1A
FCGR1B	FCGR3B	FCRL2	FDFT1
FDX1	FEZ1	FGF18	FGFBP2
FIGF	FKBP1A	FLI1	FLT3LG
FN1	FOXJ1	FOXP3	FOXP1
FOXP3	FPR1	FPR2	FPR3
FRYL	FUT4	FUT5	FYB
FZD2	FZR1	G0S2	GADD45A
GAGE1	GAGE2A	GALC	GATA2
GATA3	GBA2	GBP1	GBP2
GBP5	GCH1	GCNT1	GDPD5
GGT1	GIMAP5	GLDC	GLG1
GM2A	GNG7	GNLY	GOLGA8A
GPC4	GRSF1	GSTA4	GTF3C1
GUCA1A	GZMA	GZMB	GZMH
GZMK	GZMM	HAL	HAVCR2
HBEGF	HDC	HELLS	HES1
HEY1	HHLA2	HIPK2	HIST1H1C
HIST1H2BC	HIST1H4K	HLA-A	HLA-B
HLA-C	HLA-DMA	HLA-DMB	HLA-DOA
HLA-DOB	HLA-DPA1	HLA-DPB1	HLA-DQA1
HLA-DQA2	HLA-DQB1	HLA-DQB2	HLA-DRA
HLA-DRB1	HLA-DRB5	HLA-E	HLA-F
HLA-G	HLA-H	HMGB1	HPGD
HPGDS	HPSE	HRH4	HS3ST2
HS3ST3B1	HSD11B1	HSDL2	HTATIP2
ICA1	ICAM1	ICOS	ICOSLG
IDO1	IDO2	IFI16	IFI27
IFI30	IFIT3	IFITM3	IFNA1
IFNA14	IFNA2	IFNA21	IFNB1
IFNG	IFNGR1	IFNGR2	IGFBP5
IGKC	IKBKB	IKBKE	IKBKG
IKZF2	IKZF4	IL10	IL12B
IL12RB1	IL12RB2	IL13	IL13RA2
IL15	IL17A	IL17B	IL17RA

Gene symbol	Gene symbol	Gene symbol	Gene symbol
IL17RB	IL18	IL1A	IL1B
IL1R1	IL1R2	IL1RAP	IL2
IL21	IL21R	IL22	IL26
IL2RA	IL2RB	IL33	IL3RA
IL4	IL5RA	IL6	IL7
INHBA	INPP4B	INPP5F	IRF1
IRF2	IRF3	IRF4	IRF5
IRF6	IRF7	IRF8	IRF9
ITGA4	ITGAL	ITGAM	ITGAV
ITGB1	ITGB2	ITGB3	ITGB7
ITM2A	JAK1	JAK2	KANK2
KAT6A	KBTBD11	KCNH2	KCNJ15
KCNK5	KDR	KIAA0100	KIAA0125
KIAA0586	KIAA1324	KIF3B	KIR2DL1
KIR2DL4	KIR3DL1	KIR3DL2	KIR3DL3
KIT	KLF12	KLF2	KLF9
KLK3	KLRB1	KLRC1	KLRC2
KLRC4	KLRD1	KLRF1	KLRK1
KMT2A	KSR1	KYNU	LAG3
LAIR1	LAIR2	LAMP1	LAMP2
LAMP3	LAPTM4B	LAX1	LAYN
LCK	LDB3	LDLRAD4	LEPROT
LEPROTL1	LGALS9	LGMN	LILRB1
LILRB2	LILRB3	LIMA1	LIME1
LMAN2L	LMO7	LNPEP	LPCAT4
LPGAT1	LRBA	LRP5L	LRP8
LRRC32	LRRN3	LTA	LTA4H
LTB	LTBR	LTK	LY75
MADCAM1	MADD	MAF	MAGEA8
MAGEH1	MAL	MAOB	MAP3K1
MAP3K2	MAPKAPK5-AS1	MAPRE3	MARCH6
MARCO	MAVS	MB	MB21D1
MCM3AP	ME1	MEF2C	MEFV
MEGF9	METTL7A	MGAM	MICA
MICAL2	MICB	MKI67	MKL2
MLANA	MLPH	MME	MMP12
MPL	MPO	MPPED1	MR1
MRC2	MRPS27	MS4A1	MS4A2
MS4A4A	MS4A6A	MSLN	MSR1
MT2A	MYD88	MYO15B	MYO6
MYO7A	NAB1	NAIP	NAP1L4
NCALD	NCAM1	NCR1	NDFIP1
NDFIP2	NEFL	NEIL3	NETO2
NFAT5	NFATC1	NFATC3	NFATC4

Gene symbol	Gene symbol	Gene symbol	Gene symbol
NFE2L3	NFKB1	NFKBIA	NFKBIB
NKG7	NLRC5	NOS2	NOS3
NPEPPS	NPR1	NPTN	NR0B1
NR4A2	NRP1	NT5C	NT5E
NUB1	NUDT9	NUMA1	NUP107
OAS1	OAS2	OAS3	OASL
ODF1	ODF2	OPTN	OSBPL10
OTUD7B	PARK7	PASK	PAX5
PBX4	PC	PCM1	PCNX
PCOLCE2	PDCD1	PDCD1LG2	PDE4B
PDGFRB	PDIA3	PDLIM4	PDXDC2P
PDXK	PF4	PHC3	PHEX
PHF10	PHKG2	PIWL2	PLA2G6
PLA2G7	PMCH	PML	PNOC
POLR2J2	POMT1	PPARG	PPBP
PPFIBP2	PPIE	PPIF	PPIL2
PPM1H	PPP1R2	PPP2R5C	PRDM1
PREP	PRF1	PRG2	PRKCCQ
PRKY	PRM1	PRR5	PRRC2B
PRSS33	PRTN3	PRX	PSMA1
PSMA2	PSMA3	PSMA4	PSMA5
PSMA6	PSMA7	PSMA8	PSMB1
PSMB10	PSMB11	PSMB2	PSMB3
PSMB4	PSMB5	PSMB6	PSMB7
PSMB8	PSMB9	PSMC1	PSMC2
PSMC3	PSMC4	PSMC5	PSMC6
PSMD1	PSMD10	PSMD11	PSMD12
PSMD13	PSMD14	PSMD2	PSMD3
PSMD4	PSMD5	PSMD6	PSMD7
PSMD8	PSMD9	PSME1	PSME2
PSME3	PSME4	PSMF1	PSMG1
PSMG2	PSMG3	PSMG4	PSPC1
PTAFR	PTEN	PTGDR	PTGDR2
PTGDS	PTGIS	PTGS1	PTPN1
PTPN11	PTPN13	PTPN2	PTPRC
PTPRJ	PVALB	PYCARD	QRSL1
RAB27A	RAD23A	RAI14	RAP1GAP
RASSF4	RBBP8	RBL2	RBM3
RCOR3	RELA	REPS1	RFX1
RFXAP	RGS1	RGS16	RGS2
RIPK1	RIPK3	RNASE2	RNF145
RNF19A	RORA	RORC	RPA1
RPP38	RRAD	RRAGB	RRP12
RUNX3	S100A12	SAR1B	SCARB2

Gene symbol	Gene symbol	Gene symbol	Gene symbol
SCG2	SCG5	SCN3A	SEC24C
SELE	SELL	SELP	SELPLG
SERPINA1	SERPINA3	SERPINB6	SF1
SGCB	SGMS1	SH2D1A	SH2D1B
SH2D2A	SH3TC1	SHMT2	SIAH1
SIGIRR	SIGLEC5	SIGLEC6	SIGMAR1
SIRPG	SKAP1	SLA	SLC15A2
SLC16A7	SLC18A2	SLC22A4	SLC24A3
SLC25A12	SLC25A37	SLC26A6	SLC30A5
SLC35F2	SLC39A14	SLC7A10	SLC7A6
SLC7A8	SMAD1	SMAD2	SMAD3
SMARCB1	SMPD3	SNCA	SND1-IT1
SNRPD1	SNRPN	SNTB2	SOCS1
SOCS2	SOCS3	SP100	SPN
SPON2	SPP1	SRSF7	SSH1
SSTR3	ST3GAL1	ST8SIA1	STAT1
STAT3	STAT4	STEAP4	STK39
STX16	SULT1C2	SYCP1	SYNGR3
SYNJ1	SYT17	TACSTD2	TAL1
TAP1	TAP2	TAPBP	TAPBPL
TBC1D5	TBCC	TBCD	TBK1
TBX21	TBXA2R	TCL1A	TCTN2
TECPR2	TFEC	TFRC	TGFB1
TGIF1	THADA	THAP3	THBS1
THBS4	THEMIS	THUMPD1	TIA1
TIGIT	TIMM8A	TINAGL1	TIPARP
TKTL1	TLE3	TLR3	TLR7
TMBIM6	TMC6	TMEM173	TMEM184C
TMEM259	TMIGD2	TMPRSS6	TNF
TNFRSF10A	TNFRSF10C	TNFRSF11A	TNFRSF14
TNFRSF17	TNFRSF18	TNFRSF1B	TNFRSF25
TNFRSF4	TNFRSF8	TNFRSF9	TNFSF11
TNFSF14	TNFSF15	TNFSF18	TNFSF4
TNFSF9	TOX	TPP2	TPSAB1
TPSB2	TPTE	TRAF3	TRAF3IP3
TRAF4	TRAT1	TREX1	TRPV6
TSC22D3	TSHR	TXK	UBD
UBE2L3	UQCRC1	USP9Y	VAMP2
VASH1	VCAM1	VDR	VEGFA
VEGFB	VEGFC	VNN3	VTCN1
VWA5A	WARS	WDHD1	WFDC21P
WNT5A	XCL1	XCL2	YME1L1
ZAP70	ZBP1	ZBTB16	ZBTB22
ZBTB32	ZBTB38	ZC3H7A	ZFP36L2

Gene symbol	Gene symbol	Gene symbol	Gene symbol
ZNF205 _GDC_CONTROL_07_ _GDC_CONTROL_32_	ZNF22 _GDC_CONTROL_14_	ZNF446 _GDC_CONTROL_21_	_GDC_CONTROL_06_ _GDC_CONTROL_24_



Ordering Information

Product	Contents	Cat. no.
QIAseq Targeted RNA Panel (12)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; fixed panel for 12 samples	333002
QIAseq Targeted RNA Panel (96)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; fixed panel for 96 samples	333005
QIAseq Targeted RNA Extended Panel (12)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; extended panel for 12 samples	333012
QIAseq Targeted RNA Extended Panel (96)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; extended panel for 96 samples	333015
QIAseq Targeted RNA Custom Panel (12)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; custom panel for 12 samples	333022
QIAseq Targeted RNA Custom Panel (96)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; extended panel for 96 samples	333025
QIAseq Targeted RNA Custom Panel (384)	Kit containing reagents for first strand synthesis, molecular barcoding, gene-specific amplification and QIAseq Beads for targeted RNA sequencing; extended panel for 384 samples	333027
QIAseq Targeted RNA 12-index I (48)	Box containing oligos, enough for a total of 48 samples (for indexing up to 12 samples per run) and Custom Sequencing Primer for targeted RNA sequencing on Illumina platforms	333114
QIAseq Targeted RNA 96-index I (384)	Box containing oligos, enough for a total of 384 samples (for indexing up to 96 samples per run) and Custom Sequencing Primer for targeted RNA sequencing on Illumina platforms	333117
QIAseq Targeted RNA 96-index HT I (384)	Box containing oligos in arrays, enough for a total of 384 samples (for indexing up to 96 samples per	333127

Product	Contents	Cat. no.
	run) and Custom Sequencing Primer for targeted RNA sequencing on Illumina platforms	
QIAseq Targeted RNA 12-index L (48)	Box containing oligos, enough for a total of 48 samples (for indexing up to 12 samples per run) for targeted RNA sequencing on Ion Torrent platforms	333214
QIAseq Targeted RNA 96-index HT L (384)	Box containing oligos, enough for a total of 384 samples (for indexing up to 96 samples per run) for targeted RNA sequencing on Ion Torrent platforms	333217

QIAseq Targeted RNA Panels are intended for molecular biology applications. These products are not intended for the diagnosis, prevention or treatment of a disease.

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Sample to Insight